

## UNITED STATES DEPARTMENT OF AGRICULTURE

+ + + + +

## NATIONAL ORGANIC STANDARDS BOARD

+ + + + +

## PUBLIC COMMENT WEBINAR

+ + + + +

TUESDAY,  
OCTOBER 24, 2017

The National Organic Standards Board  
convened via webinar at 1:00 p.m. Eastern Time,  
Tom Chapman, Chair, presiding.

## BOARD MEMBERS PRESENT:

TOM CHAPMAN, Chair  
ASHLEY SWAFFAR, Vice Chair  
JESSE BUIE, Secretary  
FRANCIS THICKE, Crops Subcommittee Chair  
SUE BAIRD  
HARRIET BEHAR  
ASA BRADMAN  
LISA DE LIMA  
STEVE ELA  
DAVE MORTENSEN  
  
JOELLE MOSSO  
  
EMILY OAKLEY  
  
SCOTT RICE  
  
A-DAE ROMERO-BRIONES  
  
DAN SEITZ

ALSO PRESENT:

PAUL LEWIS, Director, Standards Division

MICHELLE ARSENAULT, Advisory Committee

Specialist, NOSB

LISA BRINES, National List Manager

SHANNON NALLY YANESSA, Assistant Director,

Standards Division

MATT PAVONE, Policy Analyst, Standards Division

DEVON PATTILLO, Materials Specialist, Standards

Division

BRIDGET McELROY, Policy Analyst, Standards

Division

C-O-N-T-E-N-T-S

Welcome

Paul Lewis . . . . . 4

Opening Remarks

Tom Chapman. . . . . 5

Member Roll Call

Michelle Arsenault . . . . . 8

Public Comments. . . . . .10

Closing Comments

Tom Chapman. . . . . 188

Adjourn. . . . . 189

1 P-R-O-C-E-E-D-I-N-G-S

2 (1:04 p.m.)

3 MR. LEWIS: Thank you, Michelle. And  
4 welcome, everyone, to today's National Organic  
5 Standards Board webinar. I'm Paul Lewis,  
6 Director of Standards Division of the National  
7 Organic Program.

8 I would like welcome NOSB members and  
9 the public to today's Board public comment  
10 webinar. And I appreciate NOSB member  
11 participation as called, and for all your work  
12 serving on the Board.

13 This webinar provides the opportunity  
14 for the public to provide comments to the  
15 National Organic Standards Board as part of the  
16 Board's upcoming public face-to-face meeting  
17 scheduled for October 31 to November 2.

18 And at that time, at that meeting, the  
19 National Organic Program will also be providing  
20 an update on NOP activities. Please consult the  
21 National Organic Program website for further  
22 information about the face-to-face meeting.

1                   This meeting, like other meetings of  
2                   the National Organic Standards Board operates  
3                   under the auspices of the Federal Advisory  
4                   Committee Act. I am looking forward to hearing  
5                   comments from the public to assist the National  
6                   Organic Standards Board in preparing their  
7                   recommendations to USDA.

8                   I also want to thank my National  
9                   Organic Program Standards Division colleagues for  
10                  their help and their tireless work behind the  
11                  scenes to bring us to today's teleconference.

12                  I would like to now turn to the chair  
13                  of the National Organic Standards Board, Tom  
14                  Chapman. Tom, thank you for chairing today's  
15                  meeting.

16                  MR. CHAPMAN: Thank you, Paul. Sorry  
17                  it took me a moment to find my own unmute button,  
18                  so following my own advice. On behalf of the  
19                  Board, I would like to welcome everyone to the  
20                  public comment webinar prior to our Fall meeting,  
21                  which will be our sixth meeting with a webinar,  
22                  and I think everyone sees the tremendous value

1 and increased access with these web meetings  
2 given, so much that we're going to be doing two  
3 sessions this time with another session on  
4 Thursday.

5 Let me please ask for some forgiveness  
6 up front from everybody as we're having IT  
7 issues, and I know it's hard, and I've said it a  
8 couple times, but most importantly, please  
9 remember to keep yourself on mute. Star 6 to  
10 mute, star 7 to unmute, or use the handy mute  
11 button on your hand-held device. But don't put  
12 us on hold, no matter how lovely your hold music  
13 may be.

14 So after the introductory formalities,  
15 we'll be beginning public comment period, and  
16 then we'll go in order. If someone is not  
17 present at the time they are called upon, and  
18 there is time remaining at the end of the comment  
19 period, I'll run through the list again of those  
20 missed.

21 I will be calling on the next speaker  
22 as well as the next one or two on deck so you'll

1 have a little bit of a heads-up if you're coming  
2 up. If you cannot find your phone number on the  
3 list of phone numbers here, we may ask for a  
4 specific commenter to message us with your phone  
5 number. Also be sure that you're not muted.

6 When called upon, commenters are asked  
7 to give your name and affiliation for the record.  
8 We ask that you disclose all relevant  
9 affiliations pertaining to matters or business  
10 before the Board. I encourage anyone that is  
11 with us be, and if you want further  
12 clarification, to ask questions after the public  
13 commenter finishes their comments.

14 The initial comment time will be three  
15 minutes per commenter. We'll hear a buzzer at  
16 that three minute mark, and I ask our respective  
17 Board and all the other commenters that you try  
18 to finish your sentence as soon as you hear that  
19 buzzer.

20 At that point we'll field questions,  
21 if there are any, from the Board, and then move  
22 on to the next commenter. There will be

1 transcripts of this call, and that will be  
2 bundled with the transcripts for the entire  
3 meeting when they are available.

4 With that, I think we're about ready  
5 to get started. Michelle, would you be so kind  
6 to do a roll call of the Board present.

7 MS. ARSENAULT: Indeed. Thank you  
8 Tom. All right. Sue Baird. Sue, I know you're  
9 online, I can see you.

10 MS. BAIRD: I'm sorry. Here.

11 MS. ARSENAULT: That's okay. Harriet  
12 Behar?

13 MS. BEHAR: I'm here.

14 MS. ARSENAULT: Hi Harriet. Asa  
15 Bradman?

16 MR. BRADMAN: I'm here.

17 MS. ARSENAULT: Hey, Asa. Jesse Buie?

18 MR. BUIE: Present.

19 MS. ARSENAULT: Hello Jesse. Tom  
20 Chapman, we know you're here, but would you like  
21 to say it?

22 MR. CHAPMAN: Present.

1 MS. ARSENAULT: Lisa De Lima?

2 MS. DE LIMA: Here.

3 MS. ARSENAULT: Hello there. Steve

4 Ela?

5 MR. ELA: I'm here.

6 MS. ARSENAULT: Hi Steve. Dave

7 Mortensen?

8 MR. MORTENSEN: I'm here.

9 MS. ARSENAULT: Hi Dave. Joelle

10 Mosso?

11 MS. MOSSO: Here.

12 MS. ARSENAULT: Welcome Joelle. Emily

13 Oakley?

14 MS. OAKLEY: Present.

15 MS. ARSENAULT: Hi Emily. Scott Rice?

16 MR. RICE: Present, thanks.

17 MS. ARSENAULT: Thanks Scott. A-Dae

18 Romero-Briones?

19 MR. ROMERO-BRIONES: I'm here.

20 MS. ARSENAULT: Hey A-Dae. Dan Seitz?

21 MR. SEITZ: Present.

22 MS. ARSENAULT: Hello Dan. Ashley

1 Swaffar?

2 MS. SWAFFAR: Here.

3 MS. ARSENAULT: Hi there. And Francis  
4 Thicke? Francis, I know you're on. If you're  
5 talking, we can't hear you. No, still not. So I  
6 know you're present because I can see you on my  
7 screen.

8 MR. CHAPMAN: I unmuted you Francis.  
9 You were muted on yours, not on ours.

10 MS. ARSENAULT: Not there? All right.  
11 He's talking? So Francis, can you try again?  
12 Okay, well hopefully we'll work that out Tom, and  
13 get his audio working. Thank you.

14 MR. CHAPMAN: All right. With that,  
15 we'll get started. First up we have Steve Etko.  
16 Following Steve will be Harold Austin and Ruth  
17 Watts. Steve, if you could start with your name  
18 and relevant affiliation.

19 MR. ETKO: Thank you. My name is  
20 Steve Etko and I'm with the National Organic  
21 Coalition. The funding process is in full swing  
22 in Congress and NOC and its member organizations

1 and D.C. partners are very much in the middle of  
2 those discussions.

3 NOC's focus has been on funding for  
4 organic research and certification cost-share  
5 programs, expanding farmer access to regionally  
6 adapted feeds, and strengthening NOC resources,  
7 and enforcement to deal with fraudulent organic  
8 imports.

9 But unfortunately, there is also a  
10 debate taking place about the NOSB itself, with  
11 some congressional critics of organic posing  
12 questions about possible statutory changes in the  
13 Board.

14 My belief is that the current  
15 statutory structure of the Board is sound and  
16 most carefully crafted by NOC to insure full  
17 participation by all sectors of organic. While  
18 pure added changes to the NOSB process can be  
19 made administratively, it is dangerous unarguably  
20 to be making changes to the statutory NOSB  
21 structure and authority.

22 We value your work in the transparent

1 and inclusively your undertaking. NOC continues  
2 to appreciate NOSB's work to put together  
3 research priorities, and the growing list is a  
4 great example of why we are pushing for more  
5 organic research funding.

6 Some of these priorities relate to  
7 challenges regarding sunset decisions. In the  
8 state of the NOC's comments, we support the  
9 relisting of 6-copper and copper sulfate because  
10 they are critical to us for farmers and are near  
11 viable alternatives.

12 Yet, we also strongly support research  
13 targeted to finding alternatives because of the  
14 negative effects of these formulations on soil  
15 health. We appreciate the addition of organic  
16 livestock breeding to the research priority list  
17 and emphasize its importance to the integrity of  
18 organic poultry in particular.

19 More studies are needed, but  
20 investigating our way of management and feeding  
21 practices that can provide adequate total protein  
22 and thiamine for bird health and well-being, as

1 well as breeding for traits in a more suitable,  
2 thriving and organic outdoor and pasture systems.

3 We'd also like to see research  
4 priority focus on the integrity of breeding lines  
5 used in organic plant breeding and seed  
6 production, and identifying the best methods for  
7 preventing and mitigating unwanted GE material in  
8 seed used by organic operations.

9 In the better data, to better  
10 understand the extent of the problem and research  
11 that evaluates the effectiveness of methods for  
12 preventing the problem.

13 In closing, I want to thank NOSB and  
14 NOP for setting up the open dockets for the  
15 public to dialogue with the Board on an ongoing  
16 basis. It's our hope that that process can be a  
17 two-way dialogue for the Board to interact in  
18 real time with the public.

19 And that would include posting  
20 documents on key issues early to get feedback  
21 throughout the process instead of waiting just  
22 before the meeting when there's a time crunch.

1 Right now we have a one-way docket, and we need  
2 to make sure that the open docket doesn't simply  
3 become an empty docket. Thank you.

4 MS. ARSENAULT: Wow, great timing.

5 MR. CHAPMAN: Thank you, Steve. Any  
6 questions for Steve? Being none, we'll be moving  
7 on to our next speaker. Next up is Harold,  
8 followed by Ruth Watts, and after Ruth is  
9 Jeanette Hanna. Harold, are you with us?

10 MR. AUSTIN: I am.

11 MR. CHAPMAN: Can you start with your  
12 name and relevant affiliations please.

13 MR. AUSTIN: Good day everyone.  
14 Harold Austin, past member of the NOSB. I would  
15 like to thank the NOP for allowing us the  
16 opportunity to provide oral public comment via  
17 the webinar process. This is a great use of  
18 today's technology for the benefit of organics  
19 and the various stakeholders that comprise it.

20 I would also would like to thank each  
21 of you currently on the NOSB for taking the time  
22 out of your busy schedules to serve your

1 stakeholder group as well as the organic  
2 community. Thank you guys. I know the time that  
3 it takes.

4 I support the CACS's proposal on  
5 eliminating incentive to convert native  
6 ecosystems to organic production. This needs to  
7 be done.

8 I support the renewal of those  
9 materials for handling that are currently up for  
10 sunset vote at this upcoming meeting. These  
11 materials remain important to those handling  
12 operations that currently use them in their daily  
13 operations and production process.

14 I fully support the re-listing of the  
15 chlorine materials currently up for sunset review  
16 for both handling and crop production uses.  
17 These various chlorines, along with other types  
18 of sanitizers and disinfectants and other various  
19 controlled measures, are used in a variety of  
20 steps in organic crop production and handling.

21 These materials are most often used in  
22 different steps of process in order to avoid a

1 resistance build-up to one specific material or  
2 substance by the various pathogens being treated  
3 for. Thus having different forms of chlorine,  
4 along with other sanitizing materials, is  
5 important to insure proper steps have been taken  
6 to see that consumer expectations have been met  
7 and that food safety is always our number one  
8 goal.

9 The implementation of the Food Safety  
10 Modernization Act has made meeting these  
11 expectations now a legal requirement for crop  
12 producers and handlers alike.

13 I support the re-listing of those  
14 materials up for sunset review and vote for use  
15 in organic crop production. I would like to  
16 stress the importance of maintaining coppers on  
17 the national list.

18 With the removal of the  
19 oxytetracycline and streptomycin, copper has now  
20 become our number one material for control of  
21 various blight, such as fire blight and Coryneum  
22 blight that attack our crops. Without this

1 material on the national list, we would not be  
2 able to farm many of the varieties that we  
3 currently farm.

4 And we do implement a lot of  
5 horticultural practices along with these  
6 materials, so it's not just like this is a  
7 panacea. We are doing everything we can and we  
8 still have to use the copper in order to control  
9 fire blight and Coryneum blight.

10 Finally, while not perfect, the  
11 National Organic Program has helped to grow  
12 consumer and organic stakeholder confidence in  
13 the organic label and the integrity that it  
14 represents and stands for. That includes not  
15 just here in our country, but globally.

16 Miles McEvoy, during his eight years  
17 as of the head of the NOP, accomplished some  
18 amazing things that were for the good of the  
19 organic community and its various stakeholder  
20 groups. If anybody thinks otherwise, you truly  
21 do not know Miles and how strongly committed to  
22 organics he was and always has been.

1           He is the reason we have organics in  
2           our state, and we will always be appreciative of  
3           his embodiment of what organics truly represent  
4           and stand for. A way of life. Our way of life.

5           MR. CHAPMAN: Thank you Harold. Any  
6           questions for Harold? I've got one. Ashley.

7           MS. SWAFFAR: Hi Harold. Thank you  
8           for your comments. I just want to talk a little  
9           bit about the chlorine materials, and you  
10          mentioned how they're important to rotate through  
11          for resistance. Can you kind of maybe go into  
12          that a little bit more? I would like to hear  
13          your thoughts on that.

14          MR. AUSTIN: Sure. For us,  
15          particularly as a tree fruit, we use the  
16          different materials, the sanitizers and the  
17          disinfectants. We use them out in the field to  
18          treat our equipment when we are treating or  
19          cutting the limbs for fire blight control. We'll  
20          treat them with a lot of things, maybe it's with  
21          chlorine, maybe it's with peracetic acid,  
22          something like that, or hydrogen peroxide.

1           We treat our bins. We rinse our bins  
2 out. When coming to the packing facility, we  
3 also have to disinfect and clean and sanitize our  
4 storages. And when coming to our packing lines,  
5 our bins get dumped and immersed into water that  
6 has chlorine added to it. It gets transported  
7 through brushes, across some conveyor belts,  
8 maybe through some sizer cups or belts.

9           So there's a multitude of different  
10 areas where our foods get contacted with various  
11 surfaces. So we can't rely on just one material.  
12 We've got to rely on different materials so that  
13 we're breaking up the cycle of contact with the  
14 different pathogens so we're managing the systems  
15 management and control.

16           So for us, you know, having one or two  
17 materials isn't going to be adequate because of  
18 the different various control points where we're  
19 treating to control these pathogens.

20           And now the implementation of the Food  
21 Safety Modernization Act, it's now a legal  
22 requirement that we have to ensure that we're

1 providing a good, safe product for the consumer  
2 to buy and to give to their families and their  
3 children.

4 So sanitizers, especially the  
5 chlorines, are extremely important to us. We use  
6 the chlorines in our dip tanks. We use them in  
7 multiple other steps, but we intermix it with  
8 some of the other materials, such as ozone for  
9 example.

10 So we need them. Without them, I  
11 think we'd have a real tough time meeting  
12 compliance with the Food Safety Modernization Act  
13 to be honest.

14 MR. CHAPMAN: Thank you very much  
15 Harold.

16 MR. AUSTIN: Thank you guys.

17 MR. CHAPMAN: All right. Up next we  
18 have Ruth Watts followed by Jeanette Hanna, with  
19 Zea Sonnabend on deck. Ruth, are you guys hooked  
20 up?

21 MS. WATTS: Yes, thank you. This is  
22 Ruth Watts. I'm with BASF Biopolymers, and I

1 focus primarily on development of agriculture  
2 opportunities. I want to acknowledge and thank  
3 the NSOB and the NOP for the opportunity to speak  
4 at this time and for all the commitments that you  
5 guys have toward soil and environments to enrich  
6 it.

7 Slide 1 please. As citizens, we are  
8 all responsible for the health and safety of this  
9 planet. As professional stewards of the  
10 agriculture industry, we have a responsibility to  
11 not only be good stewards of water and energy  
12 usage, but we are also responsible for managing  
13 our resources efficiently by minimalizing and  
14 managing our waste.

15 Slide 2 please. Since the early  
16 1960's, the benefits of polyethylene mulch film  
17 have been known. Particularly for organic  
18 farmers, the benefits of increased yield to meet  
19 the increasing demand of organic produce,  
20 reduction or elimination of herbicides for wheat  
21 management, and reduced water consumption.

22 Despite all these great benefits which

1 already have been realized with polyethylene  
2 film, farmers are still -- they are prevented  
3 from being good stewards of the planet due to the  
4 end-of-life challenges of polyethylene mulch  
5 film.

6 Slide 3 please. Due to the high soil  
7 content of the used film, recyclers and land-  
8 fillers will not accept this material. Or if  
9 they do, the high keeping fees are extremely  
10 high.

11 Therefore, many do not have an outlet  
12 for the film, so it sits on the side of the  
13 fields. In some cases it is burned. So the  
14 question that has been proposed to me: Why are  
15 we putting our trash in somebody else's back  
16 yard?

17 Did you know that in order to get  
18 polyethylene mulch film out of the field at the  
19 end of the growing season, it requires a film  
20 thickness greater than 30 to 40 percent of what's  
21 really needed to provide those benefits that we  
22 previously mentioned.

1                   This is necessary just to be able to  
2                   extract the film from the field, including the  
3                   fragments which are created due to the loss of  
4                   mechanical properties.

5                   Slide 4 please. We've discussed that  
6                   the current commercial biodegradable mulch films  
7                   not only deliver the same benefits for the  
8                   farmers as the PE mulch film, but it addresses  
9                   the end-of-life issues in a safe and efficient  
10                  manner.

11                  What may not be discussed yet is the  
12                  biodegradable mulch films can meet these  
13                  performances as PE at very lower film thickness  
14                  since it does not have to be removed from the  
15                  film.

16                  This reduction in film thickness  
17                  demonstrates better use of input materials, and  
18                  past and present studies both from the industry  
19                  and academia show that there's no harm to the  
20                  soil or plant growth.

21                  At BASF, we are responsible for  
22                  stewardship of all of our technologies, including

1 those which are used in biodegradable mulch  
2 films. As good stewards, we all continue with  
3 research in access of biodegradable mulch  
4 technologies.

5 We would ask the Board, the NSOB, to  
6 vote not to sunset biodegradable mulch films.  
7 And we also ask the Board to recommend that the  
8 NOP remove the Memo 15-1. Thank you very much.

9 MR. CHAPMAN: Thank you. Any  
10 questions for Ruth?

11 MR. BRADMAN: This is Asa Bradman. I  
12 have a question. You can email this to me.  
13 Could you send me the weight per square meter of  
14 the biodegradable mulch? And I want to look at  
15 that in relation to the mass of the soil in  
16 making --.

17 MS. WATTS: Sure.

18 MR. BRADMAN: If you could send me  
19 that, that would be great. Just the, you know,  
20 grams or milligrams whatever per square meter of  
21 the different materials.

22 MS. WATTS: Sure. Of the different

1 types or what's needed for the actual  
2 application, because it depends on the type of  
3 film and what's required based on the, you know,  
4 the environmental condition. So I can give you a  
5 range. Would that be helpful?

6 MR. BRADMAN: A range. Yes, different  
7 types for different materials. Different types  
8 of film.

9 MS. WATTS: Yes, I'll be glad to do  
10 that.

11 MS. ARSENAULT: And Ruth --

12 MS. WATTS: Should I send that through  
13 you Michelle? Is that what I should do?

14 MS. ARSENAULT: That's exactly what I  
15 was about to tell you. So yes, send them to me  
16 and I'll distribute them. Thanks.

17 MS. WATTS: Yes, absolutely. Thank  
18 you guys.

19 MR. CHAPMAN: Also a question from  
20 Harriet.

21 MS. BEHAR: Hi Ruth.

22 MS. WATTS: Hi Harriet.

1 MS. BEHAR: Hi. My understanding is  
2 is the bioplastic that you have, when it  
3 biodegrades, it is recognized by the microbes as  
4 a food and they consume it.

5 But there are other petroleum products  
6 that are sold as synthetic fertilizers that have  
7 the same characteristic. That they are synthetic  
8 fertilizers, but are picked up by plant roots and  
9 used by microbes to fertilize plants.

10 So perhaps again, something you can  
11 send to us is explaining how your biopolymer is  
12 different than the petroleum-based fertilizers  
13 that we don't allow in organics.

14 MS. WATTS: Okay. I'll ask Dr.  
15 Schlegel, with whom you guys met last time, to  
16 see if she can address this for you.

17 MS. BEHAR: Thank you.

18 MS. WATTS: Okay, thank you.

19 MR. CHAPMAN: Up next I have Jeanette  
20 Hanna with Zea Sonnabend on deck, followed by  
21 Guernina Hamza and Brian Filipowich. All right,  
22 Jeanette, if you could start with your name and

1 affiliation.

2 MS. HANNA: Sure, my name is Jeanette  
3 Hanna and I work in Market Development for the  
4 biopolymers business at BASF. I'd like to thank  
5 the Board for taking the time to listen to the  
6 input from the participants in today's webinar,  
7 and today I wish to address the topic of  
8 biodegradable mulch film.

9 My role in market development is to  
10 work with all the stakeholders throughout the  
11 agricultural and composting industries to help  
12 identify where more sustainable practices might  
13 be possible, and then insure these practices are  
14 successfully implemented along with the proper  
15 tools.

16 The goal is that these collaborations  
17 will result in a more sustainable future for all  
18 of us. As the certification body, your work is  
19 essential for supporting developments toward this  
20 sustainable future, and as an organization which  
21 defines its standards based on ideals supporting  
22 healthy and safe farming practices to insure

1 stewardship of our planet, you are an important  
2 influencer and gatekeeper for the introduction of  
3 new technologies.

4 One of the most valuable features of  
5 the Organic Program is it has the liberty of  
6 taking a holistic view of the program. The  
7 benefit of viewing from 50,000 feet is that we  
8 can insure successful long-term outcomes, but  
9 also, perhaps unexpectedly, in some cases a high-  
10 level view also adds clarity to the details  
11 taking place at 5,000 feet.

12 In one example at 50,000 feet, there  
13 have been no shortages of publications  
14 demonstrating the impact of organic farming on  
15 soil health and global warming. This is, after  
16 all, the priority to insure that organics is a  
17 leader in materials and practices for a more  
18 sustainable future.

19 And as such an example, I see the  
20 discussion document for field and greenhouse  
21 container production is also from a high-level  
22 viewpoint. Here, the consideration includes the

1 resources required for farming by this method,  
2 and end-of-life outcomes for the materials used.

3 In particular, for the use of  
4 polyethylene film, some of the challenges that  
5 they pose for sustainable farming are described.  
6 We see here that biodegradable mulch films would  
7 either eliminate or reduce these pain points for  
8 farmers using mulch films for their crops.

9 Finally, as we take a look at the big  
10 picture, I would like to address the topic of  
11 feedstocks. This is not only an issue for  
12 biodegradable mulch film with regard to Memo 15-  
13 1, but it is relevant for current petitions and  
14 future discussions in organics.

15 For example, I reviewed some of the  
16 public comments on the Anaerobic Digestion  
17 petition. The comments expressed an urgency to  
18 define feedstocks for the AD process. I  
19 challenge this public perception by saying it is  
20 not the feedstock into the AD process which must  
21 be defined. It is the final output of the  
22 reactor which much be specified.

1                   Anaerobic digestion processes  
2           transform incoming feedstocks. It is the  
3           resulting product which is then considered as an  
4           organic farming input based on its performance  
5           and merits alone.

6                   I therefore propose that it is not the  
7           feedstocks that are important. The important  
8           thing is to define a performance standard for  
9           farm input.

10                   In the case of biodegradable mulch  
11           films, the standard for performance has already  
12           been defined and is written into the regulation.

13                   To conclude, I thank you for your time  
14           and request that you vote to keep biodegradable  
15           mulch film on the list and recommend that you  
16           request the NOP remove Memo 15-1.

17                   MR. CHAPMAN: Thank you Jeanette. Any  
18           questions from the Board? I see A-Dae.

19                   MR. ROMERO-BRIONES: Sorry, I just  
20           pressed the wrong button.

21                   MR. CHAPMAN: Okay. Any other  
22           questions from the Board? Being none, thank you

1 Jeanette for your comment. Up next we have Zea  
2 Sonnabend, followed by Guernina Hamza. Guernina,  
3 if you can message us with your phone number,  
4 we're not finding you on the webinar, and are  
5 followed by Brian Filipowich. And after Brian is  
6 Donald Lusk. So up next is Zea Sonnabend, if you  
7 could start with your name and affiliation for  
8 the record.

9 MS. SONNABEND: Am I --

10 MR. CHAPMAN: Zea, can you start over.  
11 We just unmuted you.

12 MS. SONNABEND: Okay, you can hear me?

13 MR. CHAPMAN: I can hear you, yes.

14 MS. SONNABEND: Okay, thank you. Good  
15 morning everyone. Zea Sonnabend, former NOSB  
16 member representing CCOF and from Fruitilicious  
17 Farm.

18 I'm pretty sure I'm not going to speak  
19 on every single subject today. I am going to  
20 speak just on four of the subjects.

21 First of all, an excluded message. As  
22 one of the main instigators of this effort, I

1 really do appreciate forward movement on it, but  
2 we feel that the proposal as put out needs a  
3 little more specificity to explain exactly what's  
4 being prohibited here.

5 We would like to see each of the terms  
6 defined and a particular statement about the  
7 distinction between the term cisgenesis in this  
8 context and the cell fusion within plant families  
9 that's the subject of the 2013 NOP memo.

10 There was a lot of confusion even  
11 amongst ourselves who know this stuff about it,  
12 and we do think that it would be stronger if that  
13 was clarified.

14 Next is the impurity discussion  
15 document. During the April 2016 comment period,  
16 the input was almost unanimously in favor of  
17 creating an impurity task force. All of the  
18 other ideas put forward in that last discussion  
19 document would be addressed by such a task force  
20 and a possible testing pilot program would  
21 emerge.

22 So we were disappointed that we didn't

1 see any mention of the task force in your  
2 discussion document, and we urge you to take this  
3 under consideration.

4 Next, the non-certified handler  
5 operation. We understand the problem and we  
6 appreciate your efforts to try and deal with the  
7 handlers that are not certified. However,  
8 farmers also use a lot of non-certified  
9 operations such as storage facilities; both cold  
10 storage and not cold storage.

11 An example such as apple and berries,  
12 watermelons, and winter squash, nuts, olive oil  
13 in drums and many other things. The storage is  
14 almost always, but not exclusively, for the  
15 farmer who has been taking the products back when  
16 they're ready to sell it.

17 This proposal places an excessive  
18 amount of new language on bulk containers for  
19 farmers who are just trying to put their own  
20 products somewhere in a designated storage. So  
21 this will be a significant burden on farmers, and  
22 we do urge you to modify the proposal to exempt

1 that situation.

2 Last of all, converting native  
3 ecosystems. CCOF appreciates the efforts to  
4 protect native ecosystems and we appreciate the  
5 NOSB trying to do something towards it. But we  
6 are very concerned that this proposal is  
7 unrealistic for certifiers to enforce.

8 Official maps and imaging services are  
9 not always reliable, and the CCOF written  
10 comments give some examples of this. Ten years  
11 of verifiable information is not achievable and  
12 will hold up a lot of eligible land from  
13 certification. And the law now is only for three  
14 years, so we question the legal authority to make  
15 it longer. Thank you very much.

16 MR. CHAPMAN: Thank you Zea. Any  
17 questions for Zea? I see one from Harriet.

18 MS. BEHAR: Hi Zea.

19 MS. SONNABEND: Hi.

20 MS. BEHAR: Just so you know, we have  
21 been working with the NOP in trying to get  
22 something, a seed purity task force is on our

1 agenda almost every subcommittee call. But with  
2 all the changes in the administration, and now  
3 changes here within the NOP, things have been on  
4 hold. But, just so you know, I am still carrying  
5 that torch for you and for everyone else.

6 MS. SONNABEND: I understand and we  
7 just have to keep pushing. I want to especially  
8 thank you for my ability to now go farm and not  
9 have to stay here and listen to the whole  
10 webinar.

11 MS. BEHAR: We give you permission for  
12 that, too.

13 MS. SONNABEND: Thank you.

14 MR. CHAPMAN: I also have a question  
15 from Ashley.

16 MS. SWAFFAR: Hi Zea.

17 MS. SONNABEND: Hi.

18 MS. SWAFFAR: I've got a question for  
19 you on the non-certified handler operation where  
20 you talked about, you know, like farmers going to  
21 cold storage and just other storage. Do you  
22 think there's any risk factors there that we

1 really should address? Or should we just exempt  
2 them all?

3 MS. SONNABEND: No, because as an  
4 inspector it's very easily auditable. We have  
5 what's called an affidavit that the cold storage  
6 operator signs. And they have to have a  
7 designated organic area within it, and only keep  
8 organic products in there. And yes, it's fairly  
9 easily auditable. And if it came up in  
10 inspection that there might be a problem, we  
11 could always go visit. The inspector could visit  
12 each storage facility.

13 MR. CHAPMAN: Any other questions for  
14 Zea? So Zea, this is Tom. I also have a  
15 question on food operations. Two questions, or a  
16 question and a statement really.

17 So the first question is, do you think  
18 it's an unreasonable burden to require small  
19 farmers to have a label on their products being  
20 sent to the third-party storage that specifies  
21 what's organic, who certified it as organic, and  
22 who they are?

1 MS. SONNABEND: Yes. I mean right now  
2 we only, we have to label things of course, but  
3 bin tag labels for instance only say organic, and  
4 the name of the farm, and what the product is.  
5 We don't have to say who certifies it or who's  
6 going to handle it later because it's us. The  
7 name of the firm is already the handler.

8 And then the size of the bin tag, you  
9 know, then you'd have to design it like a  
10 professional label and CCOF would have to approve  
11 it, or you know, whoever certify it. It's a  
12 pain.

13 And one other thing to that is  
14 sometimes when a farmer puts it into storage,  
15 they don't know who's going to handle it. If I  
16 have apples that aren't sold yet, and I might  
17 send them out for juice or packing, I don't know  
18 who's handling it.

19 MR. CHAPMAN: The name wouldn't be the  
20 future handler. The name would be the last  
21 handler, which in this case would be your  
22 operation in your example.

1 MS. SONNABEND: Oh, well that's not  
2 clear from the proposal.

3 MR. CHAPMAN: So any future labeling  
4 of that certified product would then need to be a  
5 certified operation in and of itself with  
6 labeling and expiration?

7 MS. SONNABEND: Yes.

8 MR. CHAPMAN: And then one other  
9 comment I did have on this, and we'll need to go  
10 back and look further, cites a plan to talk about  
11 at the meeting, but I don't know if the way we  
12 wrote our guidance if it would affect third-  
13 party warehousing. Because I think we mostly  
14 would mostly direct it toward the sale of  
15 products.

16 So a third-party warehouse itself, in  
17 the warehousing activities is not, you know,  
18 involved in sales, unless you are selling to that  
19 warehouse, which is a different situation. But  
20 if you're just contacting for the storage  
21 situation, I don't know if that was covered under  
22 ours and I would need to go back and read it in

1 detail for --.

2 MS. SONNABEND: It's very vague. I  
3 mean it's, it could be or it couldn't be. It's  
4 not written clear enough for that in my opinion.

5 MR. CHAPMAN: Any other questions for  
6 Zea? Zea, thank you very much for your time and  
7 go enjoy farming.

8 MS. SONNABEND: All right. Thank you.

9 MR. CHAPMAN: Up next we have Guernina  
10 Hamza. I haven't seen her on, so Guernina going  
11 once, going twice, all right. Up next we have  
12 Brian Filipowich followed by Donald Lusk, who we  
13 also haven't seen. So Donald, if you're there,  
14 can you send a message in to us with your phone  
15 number? After Donald, we have David Zuckerman.  
16 Brian, if you could start with your name and  
17 affiliation for the record.

18 MR. FILIPOWICH: Yes. You can hear  
19 me?

20 MR. CHAPMAN: Yes, we can.

21 MR. FILIPOWICH: Hi. I'm Brian  
22 Filipowich. I'm commenting from the Aquaponic

1 and Hydroponic Organic Coalition. I'm also the  
2 Aquaponics Association.

3 The organic label is ultimately about  
4 empowering consumers to find products that match  
5 their values, means that a consumer doesn't have  
6 to walk into a grocery store and spend an hour  
7 researching every head of lettuce they buy, like  
8 where it came from.

9 So then the question is, what are  
10 these values that consumers care about that they  
11 want to see in the organic label? And if you  
12 look at them, you will find that aquaponics and  
13 hydroponics can meet all these things that  
14 consumers care about.

15 The first is that there's --  
16 aquaponics and hydroponics grow produce without  
17 synthetic pesticides or fertilizers. They are  
18 also very good at cycling resources and being  
19 very efficient with resource use, so they're very  
20 sustainable.

21 And thirdly, production that relies on  
22 biological systems and robust microbiology.

1 Consumers want to know that their produce has  
2 been grown in the same way that it's been grown  
3 since the dawn of time, rather than in some  
4 sterile environment.

5 So Aquaponics and Hydroponics mesh all  
6 these things that the consumers want in their  
7 produce when they see that label.

8 Now we approach a time in development  
9 of the organic program in which there's a big  
10 supply shortage. There's many places in our  
11 country where they don't have access to much or a  
12 large variety or affordable organic produce.

13 So according to the laws of supply and  
14 demand, there should be investors and growers  
15 rushing in to meet this supply shortage. Why  
16 aren't they?

17 For soil growers, it's because they  
18 have to go three years leaving their fields  
19 fallow. So you can't just start growing new  
20 organic crops.

21 For aquaponic and hydroponic growers,  
22 it's this indecision about whether they will

1 retain the organic eligibility because the  
2 organic price premium is so important in business  
3 decisions, and brings people into the market.

4           So if the NOSB is able to send a clear  
5 signal that aquaponics and hydroponics remain  
6 eligible for organic certification, we'll see  
7 resources flood into aquaponic and hydroponic  
8 growing. And this will be a benefit for  
9 everybody.

10           It will be a benefit for sustainable  
11 growers. These are the people that are trying to  
12 make the changes we need in our agricultural  
13 system to save our planet. They will gain  
14 financial viability, access to more resources,  
15 skilled labor and technical advancements.

16           Consumers will see more and more  
17 affordable organic produce. The environment will  
18 benefit because aquaponic and hydroponic systems  
19 are constructed as closed-loop systems with  
20 minimal to no agricultural runoff, and minimal  
21 water and resource use.

22           And finally, the economy will benefit

1 because aquaponic and hydroponic systems, they  
2 create controlled environment, year-round jobs,  
3 even in urban areas and drought-stricken areas.  
4 So everyone benefits from organic aquaponic and  
5 hydroponic. That concludes.

6 MR. CHAPMAN: Thank you Brian. Any  
7 questions for Brian? Being none, thank you Brian  
8 for your time. Up next I have Donald Lusk  
9 followed by David Zuckerman and then Nicole  
10 Dehne. Donald Lusk, are you here?

11 MS. ARSENAULT: Tom, I don't see him  
12 in the list. There was an area code that, his  
13 area code, but I guess it's not him.

14 MR. CHAPMAN: Donald going once,  
15 Donald going twice. All right. We're moving on  
16 to David Zuckerman. David, are you here?

17 MR. ZUCKERMAN: I am here. Can you  
18 hear me?

19 MR. CHAPMAN: I can. Hold on one  
20 second David. David, we'll go with you next,  
21 followed by Nicole Dehne, and then Jackie  
22 DeMinter after that. David, if you could start

1 with your name and affiliation for the record.

2 MR. ZUCKERMAN: Sure. My name is  
3 David Zuckerman. I'm a certified organic farmer.  
4 I'm also the Lieutenant Governor of Vermont with  
5 many friendly organic communities across Vermont  
6 and elsewhere.

7 Thank you for taking the time to  
8 listen to many of us with our thoughts and  
9 concerns. My comments are related to the  
10 hydroponic issues that was actually just recently  
11 spoken to you by Brian.

12 In general, by the way I would also  
13 state that I don't grow crops that are in  
14 competition right now with hydroponics or even  
15 about my individual business in any significant  
16 way.

17 But I will say as Lieutenant Governor,  
18 I recognize that consumer confidence in the  
19 product and product accuracy in labeling is  
20 critically important. In Vermont, we have  
21 experienced that with maple syrup and other  
22 products where the consumer possession of the

1 product and the label does create value, and  
2 that's critically important to organics as well.

3 I am frankly concerned that  
4 hydroponics are part of the organic labeling  
5 system at this time, and I would like to see it  
6 be discontinued.

7 Because Brian, one of the things he  
8 mentioned, was production since the dawn of time,  
9 production of vegetables has not been done  
10 hydroponically since the dawn of time.

11 Vegetables have been soil-based, and organic  
12 production fundamentally is soil-based. We need  
13 this production as building the soil, and  
14 building it healthier for the future.

15 What people think organic means and  
16 what people want it to mean are very important.  
17 There is 2016 Consumer Reports perception survey  
18 on words like natural and organic. And  
19 throughout, it was clear that what people wanted  
20 was clearly more; more strict and more clear, not  
21 more broad.

22 I couldn't find a survey question

1 specifically that said, do you think organic  
2 means grown in soil, or should it be grown in  
3 soil. So I don't know the answer of the consumer  
4 perception. But with my customers, I can  
5 certainly hazard to guess that they clearly  
6 expect it to be grown in soil.

7 And what organic is about is building  
8 the soil and making it healthier. That's why we  
9 rotate crops, we plant cover crops, and we test  
10 our soils for soil health issues. But this  
11 includes in depth microbes; all the different  
12 interactions in the soil and the associated  
13 relationships with the plants.

14 And while we all do want organics to  
15 be more accessible to more people, as Brian  
16 states, the way to make it more accessible is  
17 about a better economic justice system. And  
18 that's not really the purview of obviously this  
19 committee.

20 But what we should not be doing is  
21 expanding production or reducing costs to the  
22 consumer by watering down the standards. And I

1 do mean double entendre there.

2 Strong standards are the key to the  
3 integrity of organic products. That's what will  
4 build the consumer demand which will then have  
5 more farmers meet that demand and expand  
6 interest. We're not leading an immediate  
7 gratification society. We need to change  
8 accordingly.

9 In closing, as an elected official and  
10 a realistic organic farmer, I want to paint the  
11 following parallel. Organic farming without soil  
12 is like democracy without people. Thank you very  
13 much.

14 MR. CHAPMAN: Thank you. Any  
15 questions for David? I see Harriet.

16 MS. BEHAR: Hello David. There's a  
17 lot of perception that consumers only care about  
18 the inputs used on organics. That they buy  
19 organic produce just because they believe there's  
20 no pesticide residues. I personally don't  
21 believe that. I think that they care more about  
22 the greater ecosystem. Can you speak to that a

1 little?

2 MR. ZUCKERMAN: Well, I don't have  
3 statistics to speak to that, but I would  
4 certainly be able to indicate through my CSA and  
5 the customers that I have at the farmers market,  
6 you know, well over 1,000 to 2,000 people between  
7 those two, that the inputs are clearly one piece  
8 of it.

9 But there's no doubt in my mind that  
10 individual health, they perceive it as healthier.  
11 Now one could argue hydroponics may meet that  
12 criteria. But I do think many also consider  
13 organic better for water quality in terms of the  
14 streams and rivers. And if we have more organic  
15 being done through hydroponics at a lower cost,  
16 we can actually have more conventional  
17 agriculture on the lands next to rivers and  
18 streams.

19 So our consumers, certainly in  
20 Vermont, are pleased to see water quality  
21 improvements through organic agriculture which I  
22 think goes to that broader message that you were

1 just asking about in terms of taking beyond  
2 themselves, but to what is the long-term food  
3 production system in terms of soil health,  
4 climate.

5 I happen to raise chicken and pigs,  
6 which means I've also pastured to organic  
7 standards and beyond organic standards according  
8 to some animals that are raised organically out  
9 there without very much access to pasture. But  
10 with rotational grazing, we're also sequestering  
11 carbon.

12 And so many consumers are seeing  
13 organic as a far more holistic production system  
14 than just what the inputs are and what the  
15 product produced is.

16 MR. CHAPMAN: Thank you. Any other  
17 questions for David? David, I have a question  
18 for you. You kept using the term hydroponics and  
19 talked a little bit about aquaponics, but there's  
20 a spectrum between in-ground and, you know, fully  
21 listed hydroponic operations. Where do you think  
22 the line is appropriately drawn?

1                   MR. ZUCKERMAN: I'm not sure I know  
2                   the distinction you've just indicated because I  
3                   don't produce using any of those methods, so I'm  
4                   not an expert in them. So if you could either  
5                   give me a little more clarity on what the  
6                   differences are, I could tell you where it would  
7                   fall.

8                   But in general, I think it should be,  
9                   production should be soil-based. And so if  
10                  there's hydroponics and aquaponics, whether it's  
11                  one of those with fish and so forth, then, you  
12                  know, that's still -- neither of those are soil-  
13                  based as far as I understand it. And if I'm  
14                  mistaken, please understand that I may be.

15                 MR. CHAPMAN: There's also a spectrum  
16                 of container-style production that's grown in  
17                 containers with what's possibly known as potting  
18                 soil?

19                 MR. ZUCKERMAN: Well, I think if it's  
20                 better, geology matters, and again I don't know  
21                 the expert there, but if you're growing in  
22                 compost and soil and that soil is getting turned

1 back in and then new soil is used, and you're  
2 again part of a soil-based medium that is  
3 potentially recycled into, you know, a compost  
4 facility or broader soil arenas.

5 Then we are also taking soil from  
6 those places to grow in pots to use better water  
7 management, then I think that's reasonable. But  
8 if there isn't soil and all of the associated  
9 microbes and complexity affiliated, I would lean  
10 towards staying more strict than going more  
11 loosely.

12 I just don't think that we should  
13 loosen standards to meet ancillary demand around  
14 organic. We should work to bring more people to  
15 the high quality standard, the holistic standard  
16 that organic was originally intended to be, even  
17 before there was a national standard.

18 MR. CHAPMAN: I don't see any other  
19 questions at this time, so thank you for your  
20 comments.

21 MR. ZUCKERMAN: Thank you.

22 MR. CHAPMAN: Next up we have Nicole

1 Dehne followed by Jackie DeMinter, and then  
2 Lillie Snow. Nicole, are you here?

3 MS. DEHNE: Yes, can you guys hear me?

4 MR. CHAPMAN: Yes, we can. Can you  
5 start with your name and affiliation for the  
6 record.

7 MS. DEHNE: Absolutely. So hello. My  
8 name is Nicole Dehne. I'm the Certification  
9 Director for Vermont Organic Farmers. That's  
10 NOLA Vermont's USDA accredited certification  
11 program. We currently certify over 700 organic  
12 farmers and processors in Vermont.

13 And I appreciate the opportunity to  
14 comment on a few issues that are critical to our  
15 certified producers today, and I want to  
16 acknowledge and thank Board members for their  
17 hard work and dedication being on the NOC.

18 So to start, regarding the organic  
19 seed guidance, the OS supports NOC's  
20 recommendation clarifying the NOC guidance  
21 document 5029. However, we do not support the  
22 additional record-keeping requirement that asks

1 producers to justify the use of non-organic seed  
2 for each variety on the list.

3 This language we feel is too  
4 prescriptive and is not a sound and sensible  
5 approach. In addition, we do not agree that the  
6 regulations should include language that requires  
7 full compliance of 205, 204A, and it doesn't seem  
8 fair to burden the farmer with sourcing organic  
9 seed and planting staff that may not exist. We  
10 suggest including language that requires  
11 continual improvement without requiring full  
12 compliance.

13 In regards to hydroponics, as you just  
14 heard, our certified organic producers feel very  
15 strongly that hydroponic, aeroponic, and  
16 aquaponic should not be labeled as organic.

17 Our preferred approach is to require  
18 that organic crops are grown in the ground while  
19 exempting production sold in pots like herbs and  
20 bedding plants.

21 However we appreciate the work and the  
22 questions posed in the NOC discussion document

1 regarding field and greenhouse container  
2 production, and we strongly agree that these  
3 issues need to be addressed.

4 As far as artificial light, there  
5 would be no significant impact to Vermont  
6 producers if the standards required all natural  
7 lighting. In fact, we believe that it's against  
8 the principles of organic production to use  
9 artificial light in lieu of a renewable resource,  
10 the sun.

11 In addition, the use of artificial  
12 light seems counter to the principles that  
13 require livestock to have daily access to direct  
14 sunlight. So we feel that if natural light is  
15 important for animal health, then we should  
16 acknowledge that it's also important for the  
17 production of healthy plants.

18 As far as synthetic mulches, producers  
19 who use synthetic mulch in outside production  
20 areas, we feel they should be required to  
21 implement practices that would create habitat for  
22 wildlife and promote biodiversity. So covering

1 acres of fields with synthetic mulch, we feel  
2 that's going to have a negative impact on soil  
3 and the surrounding natural environment.

4 As far as crop residues and  
5 substrates, organic producers should be held  
6 responsible for recycling crop residues and  
7 substrates. In addition, we think that producers  
8 should be required to recycle plastic or non-  
9 compostable containers, and all certified  
10 producers should be required to address the use  
11 of plastic on the farm. I really liked the  
12 comments from the biodegradable mulch folks in  
13 some of those pictures.

14 And then as far as clarifying  
15 emergency for synthetic parasiticide usage, we  
16 feel that the NOC did a great job on that  
17 proposal, and it's going to help us with  
18 enforcing those regulations consistently.

19 MR. CHAPMAN: Thank you, Nicole. Any  
20 questions for Nicole? I don't see any questions  
21 for Nicole. Thank you very much for your  
22 comment.

1 MS. DEHNE: Yep. Thank you.

2 MR. CHAPMAN: Up next we have Jackie  
3 DeMinter followed by Lillie Snow, and then Joel  
4 Kelly. Lillie, I have not seen on the list, so  
5 if you're here, can you text us your phone number  
6 in the chat. And Jackie, are you here? Jackie,  
7 I've got you muted, hold on. Jackie are you  
8 unmuted now?

9 MS. DeMINTER: I believe I'm unmuted.  
10 Can you hear me?

11 MR. CHAPMAN: You are unmuted.  
12 Jackie, could you start with your name and  
13 affiliation for the record.

14 MS. DeMINTER: Good afternoon. My  
15 name is Jackie DeMinter. I am a Certification  
16 Policy Manager at MOSA. We certify approximately  
17 2,000 operations throughout the United States  
18 including dairy, livestock operations and about  
19 1,700 certified per crop.

20 My comments will address clarifying  
21 emergency for use of synthetic parasiticides and  
22 strengthening feed guidance. Thank you for the

1 opportunity to comment on those topics. The  
2 NOSB's position to encourage and embrace growth  
3 of the organic industry and to strengthen the  
4 organic field, we appreciate and encourage a  
5 patient process for coming to the right final  
6 recommendation.

7 We support the general direction of  
8 the NOSB to further define parameters for custom  
9 management plans on organic operations. The  
10 proposal gets at the right intent, but suggested  
11 text and location in the current rule had us  
12 recommending that this be further discussed.

13 As certifiers, we need real language  
14 that's enforceable and clear. Guidance would  
15 probably present the most flexibility for  
16 examples in considerations in different  
17 circumstances, but that idea aside, our written  
18 comments offer alternate language and placements  
19 in the rule.

20 We think that a new proposed rule  
21 would be better located in CFI 238D, where the  
22 allowance fee of such medication is located,

1 known preventive practices and better married  
2 biologics are inadequate to prevent sickness.

3 We are hopeful that the OLPP Rule will  
4 become a factor and it will immediately have  
5 strengthened the attention to parasite management  
6 plan. Our intention was to better assess the  
7 plan for prevention already in place, emergency  
8 measures planned in the event of an outbreak, and  
9 why such a situation may arise.

10 In our experience, an emergency would  
11 occur when one or more animals are going to die,  
12 or be permanently damaged, or going to spread  
13 their parasites to more livestock if they do not  
14 receive treatment right away.

15 We have to be sure that adequate  
16 prevention methods are built in to the organic  
17 management system. But even with these best  
18 measures in place, parasites are adaptive and  
19 they can appear quickly.

20 On the flip-side, we would not  
21 consider regular outbreaks as a result of  
22 inadequate pasture management to be an emergency.

1 We appreciate that the proposed approach could  
2 curtail regular, routine use of parasiticides due  
3 to inadequate management activity.

4 Moving on to the proposal for  
5 strengthening feed guidance, we've provided  
6 detailed comments in the Spring and have again  
7 this Fall. We appreciate and support the  
8 Committee's efforts to strengthen the organic  
9 feed guidance.

10 However, we do have some concerns  
11 about certifier enforceability impracticality.  
12 For example, having full compliance with organic  
13 food usage seems impractical for some growers,  
14 and requiring the farmer to prevent and avoid  
15 contamination from the stated methods seems as if  
16 it would be particularly challenging to enforce.  
17 Our written comments outline concerns and  
18 questions, and offer alternate language in some  
19 cases.

20 Thank you for your work on these  
21 challenging and precedent-setting topics.

22 MR. CHAPMAN: Thank you, Jackie. Any

1 questions for Jackie? I see Ashley.

2 MS. SWAFFAR: Hi Jackie. Thank you  
3 for your comments. You were talking so quickly,  
4 I was trying to take notes. Did you feel that  
5 guidance would be better for emergency --  
6 defining emergency use for parasiticides?

7 MS. DeMINTER: I think guidance would  
8 provide the most flexibility for such a robust,  
9 you know, step-up type program the NOSB is  
10 talking about. We talked about this in the  
11 Spring, too, and -- you know, guidance was one  
12 idea, and you know obviously of the proposal  
13 here. And if I remember seeing that you guys had  
14 put that through. So setting aside the idea of  
15 guidance, we are proposing alternate rule  
16 placement and language for your consideration.

17 MS. SWAFFAR: Thank you. You know how  
18 I feel about guidance.

19 MS. DeMINTER: I do.

20 MR. CHAPMAN: Okay, Harriet.

21 MS. BEHAR: Hi Jackie.

22 MS. DeMINTER: Hi Harriet.

1 MS. BEHAR: Also what I wanted to just  
2 bring up about guidance versus rule. And part of  
3 that is also providing the operator somewhat of a  
4 road map so they understand. Guidance is kind of  
5 more for the certification wonks. It's very rare  
6 for an operator to actually try to figure out  
7 what is the regulation they have to follow by  
8 going and looking at guidance.

9 So that was part of the thought of  
10 putting it in the rules so people could see. But  
11 I've been a little bit drowning in hydroponic  
12 comments, but I will make sure that I get to  
13 yours when I look at the emergency treatments.

14 MS. DeMINTER: If you have any  
15 questions about our suggestions or ideas about  
16 location or placement in the rules, feel free to  
17 contact me.

18 MS. BEHAR: Okie dokie.

19 MR. CHAPMAN: Okay, thank you very  
20 much.

21 MS. DeMINTER: Thank you very much.

22 MR. CHAPMAN: I don't see any other

1 questions at this time. Up next we have Lillie  
2 Snow, followed by Joel Kelly, followed by --  
3 sorry if I butcher this -- Joszhe -- J-O-S-Z-H-E  
4 -- Tosa. Lillie Snow, are you on the line? I  
5 don't see your phone number.

6 MS. ARSENAULT: I'm not finding Lillie  
7 either, Tom.

8 MR. CHAPMAN: All right. Lillie going  
9 once, going twice. Joel Kelly. Joel Kelly, are  
10 you here? I'm not seeing Joel on the list.

11 MS. ARSENAULT: No, I don't see Joel  
12 either.

13 MR. CHAPMAN: Joel going once, going  
14 twice. All right. Joszhe -- J-O-S-Z-H-E, sorry  
15 again for butchering your name -- are you on the  
16 line? I'm also not seeing your phone number.  
17 All right. Going once, going twice. Up next, and  
18 I --

19 (Telephonic interference.)

20 MS. ARSENAULT: Can everybody hear me  
21 okay?

22 MR. CHAPMAN: Yes.

1 MS. ARSENAULT: We're getting some  
2 feedback.

3 MR. CHAPMAN: We're getting feedback.  
4 (Simultaneous speaking.)

5 MS. ARSENAULT: Is that better?

6 MR. CHAPMAN: Yes, that solved the  
7 problem. All right. If you'll give me one  
8 second, I'll announce the next people. So after -  
9 -

10 (Telephonic interference.)

11 MS. ARSENAULT: If you could, if  
12 you're on your computer and on the phone, make  
13 sure your speakers on your computer are off.  
14 That's generally how we end up with feedback like  
15 that.

16 MR. CHAPMAN: So after Alexis, we have  
17 Cody Kiroff and Amalie Lipstreu. And Alexis, if  
18 you could begin with your name and affiliation  
19 for the record. Alexis, are you there?

20 MS. BADEN-MAYER: Yes, I'm going to  
21 turn you off and then begin.

22 MR. CHAPMAN: Okay.

1 MS. BADEN-MAYER: Hi, I'm Alexis  
2 Baden-Mayer, the Political Director of the  
3 Organic Consumers Association. OCA is the  
4 largest network of organic consumers. We reach  
5 400,000 people via email each week, and connect  
6 with millions each day via social media. Thank  
7 you to the NOSB and the National Organic Program  
8 for providing this online public comment  
9 opportunity.

10 I am here today to speak in favor of  
11 the Crops Subcommittee proposal for hydroponic  
12 and container growing recommendations with the  
13 comment that sunlight and fresh air should be  
14 required.

15 This week I submitted 15,000  
16 signatures on a petition in support of the  
17 proposal. That petition continues to gather  
18 signatures and we'll update you in Jacksonville  
19 on the final numbers.

20 Health currently is the number one  
21 reason why people buy organic foods. So our  
22 members were alarmed to learn that hydroponic

1 greens can cause high concentrations of nitrate,  
2 which can be toxic and have been linked to  
3 stomach cancer.

4 Health drives most sales of organic  
5 foods. What a significant percentage of organic  
6 consumers, especially among the hard-core, cite  
7 healthy environment as one of the reasons they  
8 buy organic.

9 A 2016 Pew Research Center study found  
10 that among the people who say most or some of the  
11 food they eat is organic, 88 percent said they  
12 ate organic to get healthier food, and 48 percent  
13 of those said they ate organic to help the  
14 environment as well.

15 Our team at the Organic Consumers  
16 Association is particularly passionate about the  
17 potential of organic agriculture to reverse  
18 climate change. In 2014, we formed an  
19 international coalition to advocate for this  
20 cause. The coalition, Regeneration  
21 International, is working to increase  
22 participation in the Four for 1,000 global

1 initiative to increase carbon sequestration in  
2 soils for food security and climate.

3 So far this global agreement has been  
4 signed by 37 countries, and it's humanity's best  
5 hope of drawing excess carbon, carbon dioxide,  
6 from the atmosphere to get CO2 levels back down  
7 below the dangerous tipping point of 350 parts  
8 per million.

9 We promote organic agriculture as the  
10 best way to do this. But that argument doesn't  
11 work if you're talking about so-called organic  
12 production practices that don't use soil.

13 And, in fact, as the crops committee  
14 pointed out in its proposal, the energy use and  
15 the consequences of carbon footprint of indoor  
16 soilless growing systems is enormous.

17 Indoor lettuce is a carbon sasquatch.  
18 That's how Tamar Haspel, the Washington Post  
19 food columnist put it.

20 The Organic Consumers Association  
21 strongly supports the 2010 NOSB recommendation on  
22 production standards for terrestrial plants in

1 containers and enclosures, greenhouses.

2 We are very glad that the crop  
3 subcommittee continues to support the reasoning  
4 of that recommendation.

5 I'll close by reading from that  
6 recommendation, quote, the organic farming method  
7 derives its name from the practice of maintaining  
8 or improving the organic matter, carbon  
9 containing content of the farm soil through  
10 various methods and practices.

11 I urge the entire NOSB to hold true to  
12 this most important organic principle and approve  
13 the crop subcommittee's recommendation with the  
14 caveat that soil, per se, sunlight and fresh air  
15 to be included.

16 Thank you.

17 MR. CHAPMAN: Any questions from the  
18 Board?

19 Ashley, I see you have a question.

20 MS. SWAFFAR: Hi, I actually want to  
21 thank you for your comment.

22 I didn't quite get everything you

1       said, though. But, first, you made a statement  
2       that for the hydroponic lettuce has higher, did  
3       you say, nitrates when it was growing? Is that  
4       what you said?

5                   MS. BADEN-MAYER: No, that's actually  
6       from the subcommittee's proposal. I had not  
7       heard of that before I read the subcommittee's  
8       proposal.

9                   But then I looked it up and,  
10       apparently, there was an expose in the U.K. where  
11       hydroponic greens were tested for nitrates  
12       because they have a limit on the amount of  
13       nitrates that can be in food, maybe greens  
14       specifically in the U.K.

15                   And they found that hydroponically  
16       grown greens had levels of nitrate above that  
17       limit. And so that's how people became aware of  
18       this problem. Yes.

19                   MR. CHAPMAN: Ashley, do you have a  
20       follow up or is that --

21                   MS. SWAFFAR: Yes, I do. Was that in  
22       organic or was that conventional? Do you, I

1 mean, do you know?

2 MR. CHAPMAN: Hold on.

3 MS. BADEN-MAYER: I believe that was  
4 conventional hydroponics that had the highest  
5 levels of nitrate. And I don't think they had  
6 organic in their study when this happened.

7 But it's certainly something that, you  
8 know, as the crop subcommittee proposal points  
9 out, this is something that happens because the  
10 nitrogen fertilizer is in liquid form. And so,  
11 the plant takes it up very quickly and it can  
12 accumulate dangerous levels of nitrate in that  
13 way.

14 So, it could happen in a so-called  
15 organic hydroponic system that had liquid  
16 nitrogen fertilizer.

17 MR. CHAPMAN: Okay --

18 MS. SWAFFAR: I just want to follow  
19 up.

20 MR. CHAPMAN: Okay, yes, we'll go for  
21 one more.

22 MS. SWAFFAR: Yes, I just want to

1 point out that you said it could happen. There's  
2 no research saying that because those were all in  
3 the conventional hydroponic systems, not organic  
4 systems? That's all I have.

5 MS. BADEN-MAYER: Yes, I would love to  
6 have the data, you know, what we're considering  
7 an organic hydroponic system should check their  
8 nitrate levels.

9 But, you know, this is something that  
10 wouldn't be monitored under the current  
11 regulations.

12 MR. CHAPMAN: Okay, next I have Asa,  
13 then Steve, then Sue. Asa?

14 PARTICIPANT: With all due respect,  
15 may I chime in just for a brief second on a  
16 question for that last speaker?

17 MR. CHAPMAN: No, no, sir. We don't  
18 take any questions from the public, only from the  
19 Board.

20 PARTICIPANT: Thank you very much.

21 MR. CHAPMAN: Asa?

22 MR. BRADMAN: Yes, one quick thing.

1 I mean, I've been agonizing over these issues and  
2 I've talked to many people in certainly at least  
3 in California and many people in different  
4 strata.

5 And pretty much everyone on the  
6 consumer side is really comfortable with  
7 hydroponic and non-soil systems, you know, if you  
8 look at it online.

9 So, I'm curious, you know, it sounds  
10 like your membership differs from that, certainly  
11 bigger than the sample I have. But I'd like to  
12 have more comment on that.

13 The second thing is about the energy  
14 inputs related to lettuce. I mean, I think  
15 that's, you know, an interesting issue and really  
16 important.

17 What it leads to, though, and this is  
18 where I'm kind of concerned is that, essentially,  
19 what you're saying is that we should calculate  
20 the carbon footprint of every product.

21 So, you know, for importing cotton  
22 from India or, you know, berries from South

1 America or hydroponic production in Arizona or,  
2 you know, something grown in California, it kind  
3 of leads to a trend that, you know, it seems  
4 like, I mean, that's the ultimate implication of  
5 what you're saying.

6 So, I was wondering if you want to  
7 comment on that? And, certainly, I would  
8 actually support calculating the carbon footprint  
9 of every product, you know, in really every arena  
10 so we understand that.

11 But I think there's an implication  
12 that goes much beyond just the soil, you know,  
13 non-soil debate.

14 MS. BADEN-MAYER: Well, soil is  
15 essential, actually, to this debate, it's central  
16 because, conventional agriculture, when you total  
17 up every aspect of the supply chain starting with  
18 cutting down trees to -- et cetera.

19 Then all the way through to global  
20 transportation, refrigeration, et cetera.

21 About 57 percent of the global  
22 greenhouse gas emissions come from our global

1 food system.

2 Now, organic is the only aspect of the  
3 global food system that's reversing that trend  
4 through having the capacity to suppress the  
5 carbon in the soil.

6 And conventional agriculture can't do  
7 that. It can reduce soil erosion, soil loss. It  
8 can reduce emissions from conventional  
9 agriculture, but it can't start to reverse that  
10 trend and actually draw carbon out of the  
11 atmosphere and trap it in the soil. Only  
12 regenerative, organic agriculture processes can  
13 do that.

14 And so, if we promote, you know, my  
15 organization promotes organic agriculture on a  
16 climate change position. But we can't do that if  
17 we're doing this carbon sasquatch lettuce, you  
18 know, growing indoors using all artificial energy  
19 inputs.

20 You know, they even blend natural gas  
21 in some hydroponic systems to pump carbon dioxide  
22 into the indoor environment.

1           So, it's all, you know, and they have  
2 to, of course, replace the energy of the sun with  
3 artificial light. It's no wonder that this is  
4 the most energy intensive way to produce food  
5 possible.

6           So, yes, we're very opposed to that  
7 type of system. You know, you asked sort of the  
8 side question about whether I think that we  
9 should calculate the carbon footprint of our  
10 entire food system. And, of course, many people  
11 have.

12           I don't know if that fits into the  
13 organic standard, but I think that, you know,  
14 intuitively, when the organic law was passed in  
15 1990 before we were calculating carbon footprint  
16 in agriculture the way we are today, I believe,  
17 you know, the public is more aware.

18           There is this intuitive understanding  
19 of soil and soil health as essential to organic.  
20 And that's just as good of a reason to approve  
21 organic systems.

22           MR. BRADMAN: Yes, and I -- let's

1 give me one extra question in there.

2 I totally understand, okay, but what  
3 I'm asking about is the product specific carbon  
4 footprint. And, I guess that's just something  
5 that's maybe more, you know, maybe it's a little  
6 more on the philosophy end.

7 But if we're going to rate products  
8 and rate production system, I just think it's  
9 important to really look both at the detail level  
10 and at the general level.

11 And I totally understand what you're  
12 saying about, you know, soil sequestration of  
13 carbon and the potential benefits of that. I  
14 mean, I think, you know, I'm sure all of us are  
15 on board with that.

16 MS. BADEN-MAYER: And to be real clear  
17 that, you know, while I used that phrase lettuce  
18 is a -- indoor lettuce is a carbon sasquatch, it  
19 wasn't about lettuce, it just happened to be that  
20 they studied lettuce because they, you know, you  
21 have to study something specific and there aren't  
22 that many studies done on this.

1           So, I don't think that, you know, like  
2 looking at a soil system versus a soilless  
3 system, obviously, the soil system, especially an  
4 organic soil system has the capacity to reverse  
5 that kind of impact with carbon sequestration.

6           Whereas, the soilless system with all  
7 of this energy intensive input is always going to  
8 be a carbon sasquatch. It doesn't matter if it's  
9 lettuce or if it's something else. It's --  
10 that's the whole system is obviously a carbon  
11 bomb.

12           MR. CHAPMAN: Okay. I think I have  
13 Steve, then Sue. Ask your question, Steve.

14           MR. ELA: Yes, I guess my question  
15 comes to, we had statements to the Board and on  
16 the Board, that the perception, you know, of  
17 organic is that there is this no pesticides and  
18 no GMOs and that's really to most consumers what  
19 is important, you know, for being organic.

20           And that, you know, you said that 88  
21 percent of your consumers went to 44 percent want  
22 to help the environment.

1                   And we certainly heard claims or  
2 statements that hydroponic or container grown  
3 systems help the environment because they use  
4 less water, they have less runoff and some of  
5 these other things.

6                   But you're talking about the soil, the  
7 carbon sequestration, but can you just say from  
8 your organization standpoint or your consumer  
9 surveys a little more about, you know, that 44  
10 percent wanting to help the environment, what  
11 that -- could you flesh that out a little more?

12                   It seems that we're at this debate of,  
13 you know, what does organic mean to the  
14 consumers? You know, if you just said, no, from  
15 this prospective, most consumers, they just want,  
16 you know, they don't really care about the  
17 hydroponic issues.

18                   MS. BADEN-MAYER: Well, we didn't  
19 conduct this study ourselves, it was the Pew  
20 Research Center. The 2016 Pew Research Center  
21 study on attitudes towards food amongst consumers  
22 on a wide range of issues.

1           So, organic was one piece of that.  
2           And, in their published report, they didn't break  
3           it down any further than that. They said, 88  
4           percent said they ate organic to get healthier  
5           food and 48 percent of those said they ate  
6           organic to help the environment as well.

7           So, I mean, I'll fully admit that  
8           health is the number one driver for consumers  
9           learning about and getting to access organic  
10          food.

11          But once they're doing it, and you  
12          learn that there are environmental benefits as  
13          well, I think that could only make you more  
14          committed to the cause of organic.

15          MR. CHAPMAN: Thank you. And up next  
16          I have a question from Sue.

17          MS. BAIRD: Yes, hi, I'm really -- I  
18          appreciate your comments. I am a little  
19          concerned that you have used a study for  
20          conventional hydroponics to assert that organic  
21          hydroponics are full of nitrates.

22          It's my understanding, talking and

1 reading this hydroponics both organic and non-  
2 organic because that is the key differentiation  
3 between the organic hydroponic production and  
4 conventional hydroponic production.

5           Conventional is, in fact, a large  
6 commercial survey is what a lot -- it's all  
7 implicated. They use urea in the medium, they  
8 use nitrate in the medium, and it's all about  
9 adding various nitrates or just nitrogen  
10 production systems of import -- in nitrates in  
11 their systems.

12           Organic hydroponic consultant assert  
13 that they are using biologically safe input that  
14 does not result in the nitrates or very low  
15 additions of nitrates.

16           So, could we address that and then  
17 I'll do one follow up question, is that you're  
18 saying, at least to me, it seems to imply that  
19 you had stated that organic hydroponics always  
20 uses a lot of artificial light.

21           And yet, people that I've seen and  
22 heard of hydroponics, both conventional and

1 organic, many of them, I would say, a majority of  
2 those that I visit are being produced in  
3 greenhouses which allows the natural light to  
4 come through the greenhouses.

5 So, two questions, please.

6 MS. BADEN-MAYER: So, the nitrate  
7 issues are covered very well in the subcommittee  
8 proposal. But I'll just read one piece of that.

9 It says, in addition to bypassing  
10 naturally occurring co-evolved relationships  
11 between plant roots and the many functional trait  
12 types of rhizospheric organisms, nutrient bathing  
13 is an unbuffered system.

14 For example, nutrient solutions  
15 contain high concentrations of nitrate which  
16 plants can accumulate beyond their requirements  
17 storing excess nitrate in leaf and root vacuoles.

18 This is particularly problematic for  
19 some species like spinach and chard. Nitrate is  
20 toxic in food, has been linked to stomach cancer  
21 and can kill livestock.

22 So, you know, that's all from the

1 subcommittee proposal. And, as I mentioned, I  
2 did look that up to verify that.

3 So, you know, maybe this proposal  
4 needs to have something about testing for nitrate  
5 levels. But, you know, their proposal tries to  
6 remedy it by requiring more of a soil-like  
7 growing medium and limiting the liquid  
8 fertilizer.

9 MS. BAIRD: Thank you, I appreciate  
10 that.

11 Again, my understanding is that  
12 organic hydroponics are not using nitrate  
13 additions. If -- unless it would be lettuces,  
14 and some of them are using less than 20 percent  
15 nitrates, which is also allowed currently in soil  
16 production.

17 They're not -- they're using a  
18 biological base input. That's what I'm  
19 understanding.

20 Could you address my question about  
21 using artificial light in hydroponics as opposed  
22 to using artificial light in regular soil-based

1 greenhouses, please?

2 MS. BADEN-MAYER: Yes, we think that  
3 sunlight is best, I mean, just to state it most  
4 simply. And it would be great to have a  
5 requirement in here for sunlight for these  
6 growing systems.

7 MS. BAIRD: But it should be written in  
8 for strictly the hydroponics but not soil-based?  
9 It seems to me that that almost contradicts  
10 requiring more one type of production than the  
11 other.

12 MS. BADEN-MAYER: Not at all, I don't  
13 think that the soil-based systems would have any  
14 trouble meeting that sunlight requirement. So,  
15 sure, it could be a requirement for everybody.

16 MR. CHAPMAN: Okay, thank you Board  
17 Members for your questions. And thank you,  
18 Alexis, for your time.

19 And we're going to have to move on  
20 down the list at this time, but we appreciate the  
21 good dialogue there.

22 So, up next I have Cody Kiroff, a call

1 by Amalie Lipstreu and then up after Amalie,  
2 James Sbarra.

3 Cody, are you here? We are not  
4 showing you on the list. All right, Cody, going  
5 once, going twice.

6 Amalie, you are up.

7 MS. LIPSTREU: Can you hear me okay?

8 MR. CHAPMAN: Yes, we can. And let's  
9 get started with your name and affiliation for the  
10 record.

11 MS. LIPSTREU: I'm Amalie Lipstreu of  
12 the Ohio Ecological Food and Farm Association.  
13 And I'll speak to two issues this afternoon.

14 And the first is organic imports. Our  
15 farmers have been feeling the effects of the  
16 rising imports long before Washington placed NOP  
17 action.

18 Producers were told their grain was no  
19 longer needed, as imported grain surged into the  
20 U.S.

21 When domestic products are overlooked  
22 in favor of cheaper, and, we now know, fraudulent

1 imports, the issue is more than the need to  
2 increase domestic supply, it's also about efforts  
3 to subvert the integrity of the organic industry  
4 to meet economic goals.

5 We appreciate NOSB's quick action to  
6 move this issue through guidance. We ask for  
7 your continued diligence. Please ensure  
8 everything that can be done is being done to  
9 ensure a level playing field and monitor NOP  
10 compliance with the nine recommendations and time  
11 lines outlined in the recent audit report of the  
12 USDA Office of Inspector General.

13 Oversight improvements cannot happen  
14 soon enough for our organic producers who have  
15 lost significant income as well as faith in the  
16 ability of the NOPS to take swift action.

17 Secondly, the impact of the oil and  
18 gas industry on organic farms requires your  
19 attention.

20 We face from California to  
21 Pennsylvania, Oklahoma to Wisconsin and more, the  
22 oil and gas industry is creating negative impacts

1 on organic farms.

2 We have proposed discrete action the  
3 NOSB can take to better understand how organic  
4 farmers are uniquely impacted by this industry.

5 Support certifiers that need to  
6 provide guidance to operators, and also, that we  
7 prevent the loss of certified operations.

8 Farmers like James, whose picture you  
9 can see, who has three pipelines crossing the  
10 grazing fields of his third-generation dairy  
11 farm.

12 In the past year and a half, OEFFA  
13 supported James, providing tools in the form of  
14 an organic add impact mitigation plan and worked  
15 to ensure adoption of the recommendations that  
16 continue.

17 Despite the incredible disruptions of  
18 his farm soil, animals, and pasture, he has been  
19 able to keep in operation, to keep his  
20 certification and, importantly, to keep his  
21 contract so that he remains on the milk truck and  
22 will not be the generation to lose the family

1 farm.

2 Please consider one or more of the  
3 seven actions outlined in our written comments as  
4 they move forward on this important issue.

5 Thank you.

6 MR. CHAPMAN: Thank you. Any questions  
7 from the Board?

8 (No response)

9 MR. CHAPMAN: Hearing none, thank you  
10 very much for your comments.

11 Up next, I have James Sbarra followed  
12 by Luke Howard and Erin McQuaig, sorry if I  
13 butchered that name or botched it up.

14 James, are you here?

15 MR. SBARRA: I am, yes. You ready?

16 MR. CHAPMAN: Yes, we can. James, can  
17 you give us your name and affiliation for the  
18 record?

19 MR. SBARRA: Yes, my name's James  
20 Sbarra. I am an aquaponic farmer; we've been  
21 doing it for five years.

22 MR. CHAPMAN: Excellent, go ahead,

1 James, with your comments.

2 MR. SBARRA: Yes, so the question,  
3 what is more important, water or soil? If there  
4 is no water, plants cannot uptake nutrients and  
5 they wither and die.

6 So, why does it matter if the  
7 nutrients are suspended in water or suspended in  
8 soil? And the mechanism to make them available  
9 to the plant is water. Without water, there is  
10 no life.

11 We have proven we can go without soil,  
12 and you know you cannot go without water. So,  
13 which one is more important?

14 And to judge the aquaponics, it seems  
15 like the Board is concerned about food safety.  
16 It seems the area where we either easy to address  
17 the difference between a fish tank and plant life  
18 and a proper setup systems with fish waste should  
19 never come in contact with plants and roots.

20 Instead, that waste is mineralized and  
21 released as nutrients into the water, then that  
22 water is taken to the plant.

1           We have never had a food safety issue  
2           in five years and we get ourselves tested  
3           regularly.

4           And the exemptions, it seems like the  
5           review committee is trying to allow some  
6           exemptions is in the future needs.

7           For instance, urban spread could be  
8           allowed to be soilless. The review board states  
9           that's too hard to grow them in soil. Well, why  
10          is that? You can definitely grow herbs in soil,  
11          there is no logical reason why some plants should  
12          be allowed to go soilless while others cannot.

13          And addressing the high nitrates,  
14          aquaponic farmers do not rely on adding nitrates  
15          as they happen organically from bacteria that  
16          convert the ammonia produced by fish into  
17          nitrates.

18          This biology exists, it's backed by  
19          studies and the fact that the fish have died,  
20          without that biology is proof enough.

21          It seems like a big change in soil  
22          health. Their document stated that all organic

1 farmers should get their soil fertility from  
2 compost.

3 There are over 3,000 OMRI listed  
4 fertilizers. If all organic farmers were getting  
5 their nutrients from compost, then why do all  
6 these products exist?

7 Not one person against aquaponics has  
8 pressed on the topic that we do improve the soil  
9 health by adding fish waste to the soil. Using  
10 waste as a compost producer.

11 There are so many opinions and not  
12 facts in that document. For instance, there is  
13 one plant that's different in aquaponic plants,  
14 nitrate toxicity, shifting impacts of nutrients.

15 Aquaponics, as I note, ecological  
16 complexities and it is --- to all life, energy  
17 needs.

18 Are we going to disqualify a farm for  
19 using fossil fuels to ship their products to  
20 other countries?

21 Should we impose a time limit on  
22 tractor use?

1                   Just because, you know, just in  
2                   creating, say, daylight, use too much energy with  
3                   tractors, they've being paying their fines in,  
4                   seems a little crazy.

5                   Just in conclusion, we really think a  
6                   good compromise would be to have a label and that  
7                   states whether it's aquaponic or field grown.  
8                   And if any action is going to be taken that more  
9                   studies need to be done so that every point and  
10                  counterpoint has an actual cited study that's  
11                  relevant to the points at hand.

12                  Thank you for your time.

13                  MR. ARSENAULT: Tom, maybe you're  
14                  still on mute or --

15                  MR. CHAPMAN: Yes, I was, sorry.

16                  James, thank you very much. And that  
17                  explained why I was trying to interrupt you and  
18                  you kept going.

19                  MR. SBARRA: Sorry.

20                  MR. CHAPMAN: No problem, James.

21                  Thank you for your comments.

22                  Questions from the Board? I see Steve.

1 Steve, you had a question for --

2 MR. ELA: I've Steve --

3 MR. CHAPMAN: Go ahead.

4 MR. ELA: No problem, I was trying to  
5 be --

6 Just one quick question on your  
7 comment, yes, saying that it makes no difference  
8 whether the plant were suspended in water or soil  
9 because they're taking up all the nutrients from  
10 the water regardless.

11 But, I mean, there's a number of new  
12 studies coming out now about the mycorrhizal  
13 component of plant roots and that interaction  
14 between the soil nutrient solution and the plant  
15 root.

16 Could you speak to that as how, you  
17 know, how the mycorrhizal interaction is covered  
18 in your hydroponic system?

19 MR. SBARRA: Yes, so, again, we are  
20 running an aquaponic system. I can't speak for  
21 organic hydroponics outside of aquaponics.

22 But, for us, we are a 100 percent

1     reliant on biology because, like I said, without  
2     that, the fish would die from the ammonia  
3     toxicity that builds up. That's when the  
4     bacteria comes and converts that ammonia to  
5     nitrates eventually.

6             In terms of all the studies, I've been  
7     talking with, there's been some really cool  
8     studies going on with that. I don't think there  
9     are any studies for organic hydroponics or  
10    aquaponics that show that there is or isn't.

11            What I do know is that, our plants  
12    love it and our customers love it and, yes, I  
13    really, as I said, without water, there seems to  
14    be a very heavy emphasis on soil, for reasons  
15    that ignore aquaponics as a method to grow  
16    organically.

17            And it just seems like, well, water's  
18    a more important factor here because, without  
19    water, none would exist. Without water, that  
20    fungus isn't going to grow, that bacteria is not  
21    going to grow and the plant's not going to grow.

22            So, water seems to be the one thing

1 that we can't live without in terms of growing.  
2 And, so, why the focus is all of a sudden on soil  
3 when water has tons of biology in it already. It  
4 might be different biology, it might be the same.  
5 I don't have the study to show either way.

6 But I do think if we're going to make  
7 a decision on that, we should actually have those  
8 studies so we can make an educated decision.

9 MR. CHAPMAN: Thank you, James.

10 I am not seeing any questions from the  
11 Board at this time, so we'll move on down the  
12 list. Thank you for your comments.

13 Up next --

14 MR. SBARRA: Thank you.

15 MR. CHAPMAN: -- I have Luke Howard  
16 followed by Erin McQuaig and I don't see you on  
17 the line, just sending that message out asking  
18 for your phone number.

19 After that, I'm going to butcher this  
20 name as well, Abdeljalil, A-B-D-E-L-J-A-L-I-L,  
21 Mekkaoui. If you're here, please submit your  
22 number as well because we're not seeing you.

1                   And, after that, it's Stanley Edwards.  
2                   Stanley, I'm also not seeing you, if you could  
3                   send us your number.

4                   So, up next is Luke. Luke, are you  
5                   here?

6                   MR. HOWARD: I am here. Can you hear  
7                   me?

8                   MR. CHAPMAN: Yes, we can, Luke. If  
9                   you could.

10                  MR. HOWARD: Sure. Good morning and  
11                  afternoon. My name is Luke Howard and I am from  
12                  Blue River Organic Seed.

13                  Blue River Organic Seed is an organic  
14                  seed producer and retailer based in Ames, Iowa.  
15                  We focus on organic field corn, soy beans,  
16                  sorghum sudangrass and alfalfa seed.

17                  We have a nationwide dealer network  
18                  and a product line that can provide organic seeds  
19                  to low crop farmers in every state.

20                  But, before I get started, I just want  
21                  to say thank to the NOSB members for the time  
22                  that you commit to serving our organic community.

1 Without your hard work and commitment, we would  
2 not be as strong of a community as we are.

3 We at Blue River would like to  
4 emphasize the need to strengthen the organic seed  
5 rule. We believe that the crops committee has  
6 made great strides in providing recommendations  
7 for strengthening the rule.

8 But it must go further if we're going  
9 to protect the integrity of our industry and  
10 maintain our consumers' confidence.

11 There are a few points I'd like to  
12 make.

13 First, be careful making exceptions on  
14 using non-organic seeds. The best intentions  
15 never go unpunished. They may actually be used  
16 as a path on how to avoid using organic seeds.

17 Next, on farms like variety trials  
18 would be a dangerous method of measuring  
19 performance on the farm. Unless these are  
20 professionally executed and measured in an  
21 unbiased approach, the results could equal the  
22 opinion.

1                   My final point is, by allowing  
2                   conventional non-GMO seeds as it currently  
3                   stands, is an unfair process. Conventional seed  
4                   does not go through the same testing or protocols  
5                   that organic seed goes through. Those facilities  
6                   are not inspected for organic standards and the  
7                   seed is not held to the same standards that  
8                   organic seeds are held to.

9                   We should be looking at the integrity  
10                  of all seed used on the organic farms. By using  
11                  conventional seed, we're allowing a large gap in  
12                  our process.

13                  In conclusion, I would like to remind  
14                  you that sourcing organic seed is very different  
15                  in an organic growing farm than it is our organic  
16                  vegetable farm.

17                  In general, grain farmers are not  
18                  choosing varieties based on flavor and consumer  
19                  preference, but merely on performance-based  
20                  methods.

21                  I want to say thank you for your time  
22                  and hope to continue to work on this document and

1 make it work correctly for our organic industry.

2 Thank you.

3 MR. CHAPMAN: Thank you, Luke.

4 Any questions for Luke? I see  
5 Harriet.

6 MS. BEHAR: Hello, Luke.

7 So, on the on-farm trialing, as an  
8 organic inspector, I always encourage that. Of  
9 course, I couldn't tell people to do it, but I  
10 would ask the question, are you trialing things?

11 And, over time, I did see people buy  
12 a few bags of organic seed and then end up buying  
13 exclusively organic seed of the variety that  
14 worked well for them on their farms.

15 I think that trialing, if done  
16 correctly, we're not trying to prove that it was  
17 108-day corn instead of a 112-day corn. We're  
18 just trying to see, is it of an equivalent  
19 variety which is what our regulation requires to  
20 the non-organic seed that they're using.

21 So, I'm hoping that we can work  
22 through that. And I know that the Organic Seed

1 Alliance is actually working on an on-farm  
2 trialing guidebook to help farmers really be able  
3 to prove to their certifiers that the organic  
4 seed was of not an equivalent variety or perhaps  
5 that it was.

6 And so, I've actually seen on-farm  
7 trialing work in the -- to the benefit of the  
8 organic seed producer. And maybe you can help us  
9 with that.

10 On the other side, I have also heard  
11 some farmers that, especially in alfalfa, that  
12 they're having some problems here in Wisconsin  
13 finding alfalfa seed that really perform as they  
14 wish of the organic variety.

15 MR. HOWARD: Can I comment on both of  
16 those, Tom?

17 MS. BEHAR: Sure.

18 MR. CHAPMAN: Yes, yes, Luke.

19 MR. HOWARD: Great. Harriet, good to  
20 talk to you.

21 And on-farm variety trials are  
22 extremely important. And we're on the same page

1 but they really have to be done right because,  
2 you know, being out in the field with Blue River,  
3 I've seen the opposite approach where a farmer is  
4 using pioneer untreated corn and is really  
5 married to the brand.

6 And he tries a bag or two of organic  
7 seed and, lo and behold, it's in a low spot in  
8 the field or a high spot in the field and doesn't  
9 perform equally across the field.

10 So, I've also had the same experience  
11 that you talked about where a farmer tries some  
12 organic seed and says, yes, it works great.

13 But I think we have to be careful when  
14 we do variety trials that they're done in an  
15 unbiased approach.

16 And so, we're very close to being on  
17 the same page. When it comes to alfalfa seed,  
18 there is a major crisis that we've all been  
19 dealing with in the organic alfalfa seed  
20 marketplace. And we're all starting to recover  
21 from that.

22 And so, alfalfa seed would be maybe an

1 exception to the rule at this point. But I think  
2 in a few years that exception would go away.

3 MR. CHAPMAN: Thank you, Luke. I also  
4 have a question for you from Ashley.

5 Ashley?

6 MS. SWAFFAR: Hey, Luke, thank you for  
7 your comments.

8 Just kind of this whole trial thing,  
9 do you see farmers, in your experience and out  
10 there working with them, they'll say, yes, I  
11 tried organic last year then that one didn't work  
12 for me so I'm just going to go back to  
13 conventional? Do you see any of that happening  
14 there?

15 MR. SBARRA: Yes, and I tend to think  
16 that we have -- I'm going to say this  
17 unofficially, but one of our largest competitors  
18 in the marketplace in organic seed is Pioneer  
19 Untreated Seed.

20 And so, we often have farmers that try  
21 a few bags or try, you know, a 100 acres of  
22 organic seed and then go back to the brand that

1 they're most comfortable with.

2 You know, I'm a farmer, and changing  
3 brands or changing what's sort of a pattern is a  
4 hard thing to do. But, in order to support out  
5 industry, we really have to be on board with  
6 organic seed.

7 MS. SWAFFAR: Thank you.

8 MR. CHAPMAN: Thank you, Luke.

9 Any other questions for Luke?

10 (No response)

11 MR. CHAPMAN: Hearing none, thank you  
12 for your time.

13 And we'll move on to the next speaker,  
14 Erin McQuaig, are you here? Erin? Going once,  
15 going twice. I don't see you.

16 All right, next one, I'm going to  
17 butcher this again, Abdeljalil. Michelle, you  
18 want to try that name?

19 MS. ARSENAULT: Maybe Abdeljalil?

20 MR. CHAPMAN: There we go.

21 MS. ARSENAULT: Mekkaoui?

22 MR. CHAPMAN: Are you here? And,

1 going once, going twice.

2 All right, third up is Stanley  
3 Edwards. Stanley, are you here?

4 MS. ARSENAULT: I haven't seen Stanley  
5 on the line nor his area code, either.

6 MR. CHAPMAN: No, neither have I.

7 MS. ARSENAULT: I just left him a  
8 message for him. We're about 20 minutes ahead.

9 MR. CHAPMAN: Tracy, are you here?

10 MS. MISIEWICZ: I'm here.

11 MR. CHAPMAN: All right, thank you.  
12 So, Tracy, you'll be up next.

13 Following Tracy is Kelsey Maben and  
14 Amber Pool.

15 Tracy, could you start with your name  
16 and affiliation?

17 MS. MISIEWICZ: Hi, my name is Tracy  
18 Misiewicz and I'm the Associate Director of  
19 Science Programs for the Organic Center.

20 We're a nonprofit organization that  
21 conveniently communicates scientific research on  
22 organic agriculture. And we collaborate with

1 academic and governmental institutions to fill  
2 gaps in our knowledge.

3 So, first of all, I just want to say  
4 thank you to the material subcommittee for its  
5 recommendation on research priorities. We  
6 appreciate both the creation of the Research  
7 Priority Framework and the efforts in each  
8 subcommittee to bring forth their priorities.

9 We're particularly pleased to see the  
10 inclusion of research priorities related to plant  
11 and safe management and the development of  
12 alternative materials on the national list.

13 We rely on your research priorities to  
14 guide the development of our own research  
15 projects and we've heard this same type of voice  
16 as priorities issues by many of the stakeholders  
17 that we work with regularly.

18 We have a number of paths in ongoing  
19 research projects that have been informed by and  
20 directly addressed in NOSB research priorities.

21 Some of our ongoing projects include  
22 one to develop organic solutions for citrus

1 greening disease, another to develop integrated  
2 pest management strategies in the U.S. organic  
3 rice systems, and a project aimed at developing  
4 an organic alternative to celery powder for  
5 curing organic meat.

6 Our suggestions for additional  
7 research priorities for 2018 to be considered for  
8 inclusion include the topic of biodiversity.

9 And, in particular, we see a need for studies  
10 that assess not just the effect of different  
11 practices on biodiversity, but also the economic  
12 costs and benefits of implementing those  
13 practices on the farm.

14 So, this information --

15 (Telephonic interference)

16 MS. MISIEWICZ: -- the increasing  
17 farmer's option of those prices --

18 (Telephonic interference)

19 MS. MISIEWICZ: -- systems, believe  
20 that it's particularly relevant as the NOPs new  
21 biodiversity in resource conservation guidance  
22 comes online.

1           We also suggest a consideration of  
2 soil health for the inclusion of research  
3 priorities for 2018. Soil health has been  
4 getting a lot of attention lately, but there's  
5 still significant disagreement among the academic  
6 and agronomic communities on how to define soil  
7 health, how to measure it and the best  
8 recommendations to make to farmers.

9           We request that NOSB ensure that  
10 organic stakeholder voices are represented by  
11 requesting mandatory organic representation on  
12 USDA research boards and committees to ensure  
13 that the organic sector's interest and research  
14 needs are adequately and fairly represented.

15           And then, finally, regarding  
16 hydroponics and container production, we want to  
17 highlight that research identifies organic  
18 farming as a production method that can reduce  
19 the severity of climate change by increasing soil  
20 carbon sequestration.

21           However, it's still important to  
22 remember that organic systems do release

1 greenhouse gases and, when calculated on a per  
2 yield basis, most organic production systems are  
3 still not carbon negative or even carbon neutral.

4 So, we urge the prioritization of  
5 research that meaningfully quantifies the impact  
6 of different agricultural systems and products to  
7 mitigate climate change by including both  
8 greenhouse gas emissions and carbon  
9 sequestration.

10 Thank you.

11 MR. CHAPMAN: Okay, any questions from  
12 the Board? Emily has a question. I know you're  
13 muted, hold on. Emily, do you have a question?

14 MS. OAKLEY: Yes, can you hear me  
15 okay?

16 MR. CHAPMAN: Yes, we can now.

17 MS. OAKLEY: Great, thank you.

18 I was wondering if you could elaborate  
19 a little bit on one of the research priorities  
20 you suggested regarding biodiversity and the  
21 economic impacts of adopting biodiversity  
22 practices on the farm?

1 MS. MISIEWICZ: Sure.

2 Yes, so, there's lots of studies that  
3 show that organic -- different organic practices  
4 increase biodiversity on farms and there's lots  
5 of studies that show that there are benefits to  
6 farmers from implementing those studies.

7 So, things like, you know, increased  
8 beneficial predators that keep pest levels down.  
9 But there's also some research that's emerging  
10 that's showing that sometimes on the farm, there  
11 are tradeoffs.

12 So, one example is the research that's  
13 actually in review right now coming out of UC  
14 Berkeley. But just through communication with  
15 those researchers, what they found is that, you  
16 know, while they increase beneficial predators on  
17 those farms, they are also increasing the birds  
18 on the farms that are eating predators and  
19 they're eating strawberries in strawberry fields.

20 So, when it came down to it, when they  
21 quantified that effect, there was actually no  
22 benefits to increasing biodiversity when it comes

1 from, you know, an economic perspective because  
2 the farmers were still losing crops to those  
3 beneficial predators.

4 MS. OAKLEY: Thank you.

5 MR. CHAPMAN: Any other questions from  
6 the Board?

7 I had a question, you mentioned  
8 research on citrus greening. Was that research  
9 that you said you guys were already undertaking  
10 or research that you are recommending us as a  
11 priority?

12 MS. MISIEWICZ: Oh, that's research  
13 that we already undertaking and we're happy to  
14 see that it's continued to be a priority.

15 MR. CHAPMAN: Thank you. Any other  
16 questions from the Board?

17 (No response)

18 MR. CHAPMAN: Hearing none, we'll  
19 continue to move down the list. Thank you,  
20 Tracy.

21 Up next, I have Kelsey Maben followed  
22 by Amber Pool then Peter Nell and Megha Shah

1 Even.

2 Kelsey, are you here?

3 MS. MABEN: Yes.

4 MR. CHAPMAN: Kelsey, if you can start  
5 with your name and affiliation for the record?

6 MS. MABEN: Sure.

7 My name is Kelsey Maben. I work at  
8 CCOF as a Grower and Livestock Certification  
9 Specialist.

10 I just wanted to talk basically today  
11 about the proposal for emergency pesticide use  
12 clarification.

13 We really appreciate the work being  
14 done to clarify and strength this area of  
15 resolution. However, we see that there is  
16 potentially some further clarity needed in the  
17 proposed language.

18 For instance, in the proposed language  
19 of Part A states, quote, examples of materials  
20 management, activities and goals, you could  
21 include, and then it goes on to state some  
22 possible merits to the practices.

1           Following that, it then states that,  
2 when practices provided for above are  
3 insufficient.

4           The way this wording is laid out, it  
5 seems to first suggest that these are suggested  
6 parasite prevention areas. And then, in Part V  
7 it then seems to suggest that this may be  
8 required steps. And we feel that there's wording  
9 that could be slightly more clear.

10           The accepted area is the accepted  
11 parasite threshold suggested in the proposed  
12 language. A certifier looking to enforce these  
13 regulations, we think there may need to be a lot  
14 further guidance on what these accepted parasite  
15 thresholds will be to prevent discrepancies among  
16 certifier if it was used more meaningfully.

17           Thank you.

18           MR. CHAPMAN: Okay, any questions from  
19 the Board?

20           MS. SWAFFAR: Hi.

21           MR. CHAPMAN: Sue?

22           MS. SWAFFAR: This is for the record.

1 MR. CHAPMAN: Actually --

2 (Simultaneous speaking)

3 MS. ARSENAULT: Hi, there. This is  
4 Michelle. If you guys could put yourself on  
5 mute, we're getting some background  
6 conversations. Thanks.

7 MR. CHAPMAN: Ashley?

8 MS. SWAFFAR: Okay, thanks. Kelsey,  
9 thank you for your comments.

10 Would you care to submit what you have  
11 said to Michelle on there? Because that varies  
12 from your written comments a little bit. So, I'd  
13 like to -- I was trying to take notes and  
14 couldn't get that down all the way.

15 MS. MABEN: Sure, I can submit that  
16 information.

17 MS. SWAFFAR: And then, the other  
18 question I had, I see there's more CCOF folks  
19 coming up, but it sounds like you're the right  
20 thought person.

21 On oxytocin, and you said 37 of your  
22 members have oxytocin on their OSP right now. Do

1 you know, have they explored other natural  
2 options or is oxytocin credible for them?

3 MS. MABEN: I can't speak for every  
4 operation specifically, but generally, we allow  
5 oxytocin as a kind of emergency situation.

6 We like to know what materials they're  
7 going to use and having that looked at as an  
8 option ahead of time allows them.

9 MS. SWAFFAR: Do you use it in  
10 situations that come up quickly?

11 MS. MABEN: Many of our operations do  
12 explore other routes, whether that's like a more  
13 typical removal of the retained test or using  
14 non-synthetic fire.

15 But it varies from operation to  
16 operation. But that 37 number comes up because  
17 that's the number that you have listed that may  
18 potentially use it if a situation warrants that.

19 And then, our inspectors follow up on  
20 how that material is used.

21 MR. CHAPMAN: All right.

22 MS. SWAFFAR: Can I follow up, Tom?

1 MR. CHAPMAN: Yes.

2 MS. SWAFFAR: Yes, so, if we remove  
3 oxytocin and that's kind of what the subcommittee  
4 wrote was. I'm not sure that that's really going  
5 to happen, but looking like it.

6 Have any of your clients reached out  
7 to you being very concerned with that if this was  
8 to be removed?

9 MS. MABEN: We haven't had a large  
10 amount of concern, no. It seems that, in  
11 general, producers tend to enjoy having a larger  
12 tool kit rather than a smaller one so there's  
13 always some level of resistance for removing  
14 things.

15 That said, we haven't heard much about  
16 oxytocin.

17 MS. SWAFFAR: Thank you.

18 MS. MABEN: Thank you.

19 MR. CHAPMAN: All right, up next, I  
20 had a question from Sue. Sue, if you could try  
21 to speak up, you're a little faint last time you  
22 were asking a question.

1 MS. BAIRD: Yes, hi.

2 No, Ashley asked my question. I was  
3 a little confused about the emergency parasite  
4 effect in the position, but she asked that and I  
5 appreciate that.

6 MR. CHAPMAN: Okay, thank you, Sue.

7 Any other questions? Hearing none,  
8 thank you for your time, Kelsey.

9 And, up next, we have Amber. Amber,  
10 are you here?

11 MS. ARSENAULT: Amber is on the line,  
12 Tom. I do see her and I'm just going to ask once  
13 more, if you're not speaking, please mute  
14 yourself. I hear somebody typing. Thanks.

15 MR. CHAPMAN: And I see you on the  
16 line, but we don't hear you. Are you muted on  
17 your end? Still not hearing you, Amber.

18 I don't know if there's someone else,  
19 I know we have a couple CCOF folks in a row that  
20 can throw stones at Amber.

21 And I'm getting your message, Amber,  
22 that you're here, but we're not hearing you.

1 I'm going to go next to Peter and  
2 hopefully, we can figure out a way to get Amber  
3 on the line while Peter's commenting.

4 Peter, are you here?

5 MR. NELL: Yes, hello?

6 MR. CHAPMAN: I can hear you.

7 MR. NELL: All right.

8 MR. CHAPMAN: So, we'll go to Peter,  
9 Amber if we can figure out how to get audio for  
10 you, we'll do you next. And then, I have Megha  
11 after that and then Zak -- followed by Zak. If  
12 you're here to send in a message because I don't  
13 see your phone number as well on the phone as  
14 well.

15 So, Peter, you're up, and name and  
16 affiliation, if you can.

17 MR. NELL: Hello, my name is Peter  
18 Nell and I am the Policy Assistant at CCOF.

19 Today, I will be talking to you on  
20 various proposals.

21 First, sincere support to Amalie's  
22 proposal to be reclassify potassium acid tartrate

1 to reflect its production methods. Potassium  
2 acid tartrate should be classified as a non-  
3 synthetic agricultural substance.

4 CCOF supports the need to classify it  
5 as such provided in the proposal.

6 Second, it's unclear whether the  
7 proposal to clarify the annotations under the  
8 materials is even in scope on the national list  
9 of allowed and prohibited substances will affect  
10 CCOF members.

11 The marine materials our members often  
12 use do not work for the binomial of their source  
13 on the material safety data sheets.

14 Because of this, it's difficult for  
15 CCOF to determine if our members would be  
16 affected by the proposed annotation changes.

17 Third, CCOF supports the material  
18 subcommittee's research priority. The  
19 subcommittee identified important topics that  
20 researchers should consider.

21 Fourth, this is just thanks to the  
22 crops subcommittee for their ongoing work on the

1 organic seed guidance. CCOF supports steps to  
2 encourage more organic seed usage, increasing the  
3 volumes organic seed sector.

4 Finally, CCOF encourages the members  
5 of the Board to make use of their time by asking  
6 questions to aquaponics and hydroponic growers  
7 who are present at the webinar currently who may  
8 not be able to travel to Jacksonville.

9 Thank you for the opportunity to  
10 comment today. And Amber is with me now. So,  
11 she'll comment after.

12 MR. CHAPMAN: Thank you, Peter. Any  
13 questions for Peter?

14 (No response)

15 MR. CHAPMAN: All right, no questions  
16 from the Board. Peter, thank you for your time.  
17 And, Amber, you're up next.

18 MS. POOL: Hi, I'm here this time. I  
19 don't know what happened with my audio. Sorry  
20 about that.

21 MR. CHAPMAN: No problem, we can hear  
22 you just fine now. If you could start with your

1 name and affiliation for the record.

2 MS. POOL: Hi, I'm Amber Pool, I'm the  
3 Farm Certification and Technical Specialist for  
4 CCOF.

5 I appreciate the opportunity to  
6 comment via the webinar. And I'd like to thank  
7 the Board for continuing to offer the webinars  
8 for farmers who would not otherwise be able to  
9 travel and interact with the NOSB Board members.

10 Currently, 511 CCOF members list soap-  
11 based herbicides on their OSP. I remember that  
12 is one of the biggest hurdles to any conditions  
13 to organic production.

14 If these herbicides can be used on  
15 roadways, ditches and around structures, while I  
16 do not support their use in organic field  
17 production, continued listing of these materials  
18 allow an entire operation to be certified organic  
19 rather than just their field or production areas.

20 If any organic production areas are  
21 certified, a farming operation might choose to  
22 use a harder prohibited herbicide around the

1 roads and the structures instead of just softer  
2 spaces.

3 I'd like to briefly mention that once  
4 the NOP updates annotations, the Board should  
5 then review under the main annotations.

6 And with that, I'm done.

7 MR. CHAPMAN: Thank you, Amber.

8 Any questions for Amber? I have a  
9 question from Asa.

10 MR. BRADMAN: I'm sorry, Amber, I  
11 didn't quite hear what you said about the soap-  
12 based herbicides. It -- you went out a little  
13 bit. You said 111 users use the soap-based  
14 herbicide?

15 MS. POOL: We currently have 511  
16 members that list that soap-based herbicide on  
17 their organic system plan. It doesn't mean that  
18 they're all using it, but they do have it in  
19 their toolbox if they want to do that.

20 MR. BRADMAN: It sounded like you were  
21 or were not opposed to some uses?

22 MS. POOL: Oh, I agree that the

1 annotation should say that it can only be used on  
2 roadways, ditches and around structures.

3 I don't want that changed. I don't  
4 think it should be used in the fields, but it  
5 should be allowed to be used around roads and  
6 structures. That way -- entire operation under  
7 the organic system plan instead of field areas,  
8 food area from the organic system plan and then  
9 probably choose to use harder herbicides that  
10 aren't compatible with organic production.

11 MR. BRADMAN: Okay, okay. Thank you  
12 for that clarification.

13 MS. POOL: No problem.

14 MS. ARSENAULT: Tom, are you still  
15 there?

16 MR. CHAPMAN: I put myself on mute,  
17 sorry.

18 MS. ARSENAULT: That's okay.

19 MR. CHAPMAN: I'm getting over a cold,  
20 so when I cough I try not to be loud. I apologize  
21 when I do that.

22 MS. ARSENAULT: We appreciate that,

1 thank you.

2 MR. CHAPMAN: Yes.

3 Okay, thank you, Amber. I'm not  
4 seeing any other questions from the Board at this  
5 time, so we'll move on to the next speaker. I  
6 have Megha.

7 And, following Megha, I have Zak and  
8 then Preston Farris.

9 Megha, are you here?

10 Ms. SHAH: I am.

11 MR. CHAPMAN: Excellent. If you'd  
12 start with your name and affiliation.

13 MS. SHAH: Sure. My name's Megha  
14 Even, I'm a Senior Farm Certification Specialist  
15 with CCOF.

16 MR. CHAPMAN: Okay, go ahead and  
17 comment.

18 MS. SHAH: Okay.

19 Today, I will be commenting on the  
20 crop subcommittee's proposal and discussion  
21 document related to EPO production systems.

22 I've been working for CCOF for two and

1 a half years and, in that time, I reviewed 460  
2 farms, including more than 52 being a base  
3 production system.

4 Other continuous operations, I have  
5 reviewed approximately two-thirds to this  
6 perennial crops, blueberries, a small number of  
7 seasonal blackberries, and strawberries on  
8 elevated structures.

9 The remaining container based  
10 operations I have reviewed grow annual crops,  
11 specifically tomatoes, cucumbers and peppers.

12 I would like to share some of the  
13 practices used by certified organic container  
14 producers focusing on mainly on soil management  
15 and natural resource standards of the  
16 regulations.

17 First, I would like to emphasize that  
18 container producers must be a complete OSP as a  
19 document complaint with all areas of the organic  
20 standards.

21 CCOF requires container producers that  
22 they get additional OSP forms and include

1 detailed descriptions and photographs of their  
2 production system.

3 The OSP submitted by container  
4 producers are often lengthier and includes more  
5 and more detail when compared to OSPs submitted  
6 by in-ground producers.

7 An example of this is that each  
8 component of their growing system must show how  
9 it supports biological activity. You must  
10 explain how your life expectancy of the container  
11 substrate and how the growing substrate was  
12 disposed of at the end of the growing cycle.

13 For annual crops, I see one to two  
14 month rotations with lettuce inside containers  
15 and the use of cover crops as a natural mulch in  
16 wood topped container systems.

17 The perennial crops, there's so little  
18 vegetation in between growth, but then you have  
19 those systems where containers were placed under  
20 shade crops.

21 Container producers must know how to  
22 calculate portions of the entire production site

1 and are required to keep natural resources and  
2 biodiversity monitoring lines impacted for the  
3 verified it in sections.

4 Outdoor container producers with plant  
5 pollinator and may enhance the developer in more  
6 habitat and non-crop areas of their farm. And  
7 like the indoor container producers with  
8 inspectors of health just outside their  
9 greenhouse.

10 All container based systems are  
11 reviewed with containers, grow back, and the  
12 container substrate is either composted or  
13 incorporated into the soil outside the production  
14 area at the end of the growing cycle.

15 Container producers are comparable to  
16 in-ground producers and vary depending on the  
17 specific operation. The vast majority is not all  
18 container production producers.

19 I have reviewed the compost on the  
20 biological activity. Materials include compost  
21 made onsite. With respect to the reviewer, I  
22 support any producer that demonstrates inside the

1 organic standards, irrespective of their  
2 production.

3 Thank you.

4 MR. CHAPMAN: Thank you, Megha.

5 Any questions from the Board? I see  
6 Francis.

7 MR. THICKE: Am I on? Can you hear  
8 me?

9 MR. CHAPMAN: Yes, we can hear you,  
10 Francis.

11 MR. THICKE: The question I have is of  
12 the container growers that you've certified, are  
13 some of them 100 percent up on liquid feeding or  
14 virtually 100 percent and what percentage of your  
15 hydroponic growers are virtually all liquid  
16 feeding?

17 MS. SHAH: I personally have not  
18 reviewed any operations that are 100 percent  
19 hydroponic, although CCOF does have a handful of  
20 operations that use a 100 percent liquid media.

21 MR. THICKE: What would you say most  
22 of them are? Like what percentage liquid feeding

1 would most of them be?

2 MS. SHAH: I wouldn't be able to give  
3 a percentage. I could estimate maybe five to ten  
4 producers out of 3,500 that we've certified.

5 MR. THICKE: Five to ten, I'm sorry,  
6 I didn't quite follow that. Five to ten are 100  
7 percent hydroponic liquid feeding?

8 MS. SHAH: Correct. Yes, that's my  
9 best estimate.

10 MR. THICKE: Okay, all right, thank  
11 you.

12 MS. SHAH: You're welcome.

13 MR. CHAPMAN: Thank you, Francis.

14 Up next, I have Steve.

15 MR. ELA: Sure, this is just kind of  
16 following up on Francis's question. It's buried  
17 in there and I didn't quite catch when you were  
18 talking about the vermicompost, the compost and  
19 such, and, you know, that you needed to, you  
20 know, provide documentation of that.

21 Which then tells me that we hear so  
22 much about so many of these container systems

1 being in coconut cores, but then you're talking  
2 about maybe a document for the vermicompost and  
3 the compost and things.

4           Could you elaborate on that a little  
5 more? I didn't quite follow you and what you  
6 were saying.

7           MS. SHAH: Yes, sure. I apologize, I  
8 tried to fit in way more than I probably could do  
9 in this.

10           But what I see with our container  
11 producers are, the annual -- the producers of  
12 annual crops, you are correct, they specifically  
13 use cocoa core, a combination of cocoa core  
14 compost and sometimes volcanic rock as their  
15 substrate.

16           And then the perennial producers use  
17 peat moss, cocoa core, usually perlite or saw  
18 dust and compost as well. They use a typical  
19 substrate mixes that I've seen.

20           Does that answer question?

21           MR. ELA: You have. And I guess I  
22 just, you know, it's kind of like Francis said, I

1 mean, it sounds like only very few of your  
2 producers use a 100 percent liquid feeding.

3 Are they putting like in the  
4 vermicompost and the compost, are they adding  
5 those to throughout the growing season or is that  
6 just the initial substrate that they're putting  
7 those in?

8 MS. SHAH: Yes, that's correct. They  
9 are typically replenishing throughout the  
10 production cycle but the starting media it's in  
11 the compost and then the compost is replenished  
12 through the growing cycle.

13 MR. ELA: And do you have any sense.  
14 I guess we've had lots of discussion about liquid  
15 feeding versus using things like compost and  
16 containers.

17 I mean, it sounds like that's adding  
18 the compost is a pretty critical component of  
19 that system or -- I'm just trying to kind of get  
20 around what they're actually doing here.

21 MS. SHAH: Right. The thing is highly  
22 dependent on the operation. I do think it's of

1 enhancing biological activities.

2           They're, you know, some inherent  
3 biological activity in the cocoa core and in the  
4 peat moss. And they keep adding the compost just  
5 as an additional boost to that. That's my  
6 understanding just from a reviewer's perspective.

7           MR. CHAPMAN: Okay, I have a question  
8 from Harriet.

9           MS. BEHAR: Hi, you mentioned that the  
10 inspectors can review a biodiversity plan. Do  
11 you think that you could send that off to the  
12 shelf so we can see how you are monitoring that  
13 on these operations that use landscape cloth and  
14 shade cloth and those systems?

15           I'm just kind of curious how you're  
16 monitoring that and what percentage of the land  
17 that is being certified needs to be planted to  
18 pollinator plantings and that sort thing.

19           MS. SHAH: Sure, we provide sample  
20 monitoring routes. We're seeing a number of our  
21 operations use that as a starting point and then  
22 develop their own record keeping system, so how

1 they do that.

2 But I'd be happy to pass along an  
3 example of something that some of our operation  
4 that use it.

5 They often do some numerical counts of  
6 different wildlife and things that they've seen  
7 around their operations. They sometimes submit  
8 photos. They will often submit photos of  
9 plantings that they've done outside their  
10 greenhouse, for example, you would see probably  
11 some sunflowers.

12 And so, they'll submit photos of that  
13 -- of those practices in order to naturally  
14 requirement.

15 MR. CHAPMAN: Thank you. I also have  
16 a question from Asa.

17 MR. BRADMAN: Yes, hi. I don't know  
18 if this is the place to talk about it or if  
19 perhaps somebody else from CCOF will be talking  
20 about it in comment.

21 But I'm looking at the standard that  
22 you're proposing and the comments you submitted.

1 And the last three sentences are about basically  
2 labeling, suggesting container grown,  
3 hydroponically grown, aquaponically grown as  
4 essentially a compromise on some of these issues.

5 And I also know that, you know, you  
6 have a pretty diverse board and different  
7 opinions on this. I see this in all -- almost  
8 every other organization organic that I'm  
9 involved in.

10 So, I'm wondering if you have any  
11 insight on that and any feedback on obstacles or  
12 acceptance or comments?

13 And if somebody else was going to  
14 comment on that on the webinar from CCOF, then we  
15 can defer.

16 MS. SHAH: Sure, thank you, yes. That  
17 was going to be my comment because I haven't been  
18 directly involved in those discussions, but our  
19 Policy Director, Paula Deanwood, will be at the  
20 meeting and she will be able to answer any  
21 questions that are submitted via written comments  
22 at that time.

1 MR. BRADMAN: Okay, thank you.

2 MS. SHAH: Sure.

3 MR. CHAPMAN: All right, and I have  
4 one question as well.

5 I feel it's -- you know, and answer it  
6 to the best of your ability as a reviewer that's  
7 seen a lot of these operations. But how many of  
8 these container operations have you guys  
9 certified today would be able to meet the  
10 recommendations proposed by the crops  
11 subcommittee for containers? You know, with  
12 either their operations today or with some minor  
13 modifications?

14 MS. SHAH: From my perspective, it's  
15 very, very difficult to estimate that number.  
16 I'm not entirely confident that most of our  
17 operations will be able to meet the proposed  
18 requirements, some might be able to.

19 MR. CHAPMAN: Okay.

20 MS. SHAH: Sorry, that wasn't very --

21 MR. CHAPMAN: No worries, I know I'm  
22 putting you on the spot there. You can't answer

1 for every people about the operations.

2 MS. SHAH: It --

3 MR. CHAPMAN: Again --

4 MS. SHAH: There's some operations may  
5 be able to get it depending on the economic  
6 situation and how much time and resources they  
7 have.

8 MR. CHAPMAN: So, what you're saying  
9 is it would be a change to operations they would  
10 need to invest in new equipment, most likely?

11 MS. SHAH: Correct, I would believe so.

12 MR. CHAPMAN: Okay.

13 Francis?

14 MR. THICKE: Yes, in your proposed  
15 certification standard, you have kind of  
16 container grown hydroponics are grown and  
17 aquaponics are grown.

18 And for those that are 100 percent  
19 liquid feeding, would you require them to use the  
20 hydroponically grown label? It's a little  
21 ambiguous the way you sort of lump hydroponics  
22 into container growing.

1                   But, I'm curious, would you actually  
2                   require under that scheme 100 percent liquid  
3                   feeding operations to use the term hydroponic?

4                   MS. SHAH: I believe the proposal is  
5                   that the operations can decide for themselves  
6                   which terminology to use, whether they would like  
7                   to use hydroponically grown or container grown.

8                   MR. THICKE: That's what just like, to  
9                   me, that they could just put what they wanted on  
10                  there, right?

11                  MS. SHAH: I'm sorry, I didn't hear  
12                  your last question very clearly.

13                  MR. THICKE: It appeared to me from  
14                  the verbiage that they could decide which one  
15                  they wanted to put on, that's what I wanted to  
16                  verify.

17                  MS. SHAH: That's correct, you're  
18                  right, yes.

19                  MR. THICKE: Thank you.

20                  MR. CHAPMAN: All right, any other  
21                  questions from the Board?

22                  (No response)

1           MR. CHAPMAN:  Seeing none, thank you,  
2  Megha, for your time and answering our questions.

3           Up next I have Zak from Oregon Tilth  
4  then Preston Farris and Zen Honeycutt after that.  
5  And, Zak, are you still here?

6           MR. WIENGAND:  Can you hear me?

7           MR. CHAPMAN:  Yes, we can, Zak.  Zak,  
8  if you'd start with your name and affiliation for  
9  the record.

10          MR. WIENGAND:  Sure.  My name is Zak  
11  Wiengand.  I am the Technical -- the Harvesting  
12  Program Technical Specialist for Oregon Tilth.

13          MR. CHAPMAN:  Okay, and go ahead with  
14  your comments.

15          MR. WIENGAND:  All right.

16                 So, I'm here today to provide some  
17  insights into the efforts Oregon Tilth is making  
18  towards ensuring integrity in the organic supply  
19  chain.

20                 We feel that the discussion around  
21  excluded operations and the supply chain is a  
22  good start to the proposal.  But the discussion

1 extends to areas of certification that are also  
2 challenging, as you well know, such as imports of  
3 organic products.

4 To combat these issues, we have  
5 implemented several policies and enacted certain  
6 procedure changes that I would like to summarize  
7 for you guys and possibly inspire the NOSB.

8 Since the beginning of the year, we  
9 have implemented a policy on imported organic  
10 products, organic livestock purchase and sales  
11 and excluded operation record keeping  
12 requirements.

13 Our imported products policy was  
14 implemented in July of this year and requires  
15 that all -- that certified operations importing  
16 specific organic products, primarily grain, from  
17 outside of the U.S. notify Oregon Tilth of  
18 shipments, provide traceability documentation and  
19 get written approval from us prior to use.

20 Because of this policy, we have  
21 actually been able to identify several  
22 discrepancies in certification documentation

1 which are currently under investigation by the  
2 relevant issuing certifiers.

3 Note that this policy is actually in  
4 addition to the NOP Directive that was issued to  
5 certifiers.

6 Second, our livestock broker policy  
7 was implemented early this month. It requires  
8 that Oregon Tilth certified operations purchase  
9 organic livestock only from other certified  
10 operations.

11 Previously, we permitted purchase to  
12 uncertified brokers so long as loads are not  
13 split or combined.

14 Due to receipt of several complaints  
15 from a variety of sources about issues with  
16 uncertified brokers fraudulently representing  
17 conventional livestock as organic, we decided to  
18 take some action on that.

19 Third, we have an increased focus on  
20 verification efforts centered around purchase of  
21 organic ingredients to excluded operations as  
22 well as the record keeping expectations for

1 certified operations.

2 As part of this, we provided  
3 additional information and resources about the  
4 expectations for record keeping when purchasing  
5 organic products to excluded operations. And we  
6 have instructed inspectors to focus on verifying  
7 records for purchases in these situations this  
8 year as well as the next.

9 We do see gaps in the ability to  
10 verify a lot of this information because of the  
11 record keeping requirements for excluded  
12 operations or lack thereof.

13 But we're employing as much policy as  
14 we can to help ensure organic integrity in the  
15 supply chain and without further changes.

16 We do see the proposal for excluded  
17 operations in the supply chain and a step in the  
18 right direction to help address these issues but  
19 there's definitely more to it.

20 Thank you.

21 MR. CHAPMAN: Thank you, Zak.

22 Any questions for Zak?

1                   Scott?

2                   MR. RICE: Thanks.

3                   Zak, I just wanted to convey to you  
4 and others who are reading that document that,  
5 you know, that is not a catch-all standalone  
6 document or proposal. And, you know, fully  
7 acknowledge all of the other efforts that are  
8 happening in the community around this issue.

9                   And when the NOP came to us with their  
10 request that we look specifically at imports, we  
11 were already kind of focusing more on this  
12 excluded operations angle. And so, we chose to  
13 kind of continue in that direction.

14                   And, as a result, came up with this  
15 proposal. But, just to let you and everyone  
16 know, we will be moving forward on that request  
17 from the NOP in this next term to look  
18 specifically at imports.

19                   So, thanks for all of the  
20 implementation of practices you guys are doing  
21 and always good to examples of how that's  
22 working. Thanks.

1 MR. CHAPMAN: Thank you, Scott. Any  
2 other questions for Zak?

3 (No response)

4 MR. CHAPMAN: Hearing none, thank you,  
5 Zak, for your comments.

6 Up next, we have Preston Farris,  
7 followed by Zen Honeycutt and then Kieran Foran.  
8 Kieran, I don't -- we don't see your phone  
9 number, if you can message that to us it would be  
10 appreciated.

11 Preston, are you here?

12 MR. FARRIS: Yes, sir.

13 MR. CHAPMAN: All right, Preston, if  
14 you could start with your name and affiliation  
15 then you can just go forward with your comments.

16 MR. FARRIS: Yes, good afternoon. My  
17 name is Preston Farris. I'm a Ranch Manager for  
18 Rider Brothers, Incorporated based in Oxnard,  
19 California.

20 In my role with the company, I am  
21 involved heavily in organic berry production on  
22 several cultivars.

1           The purpose of my statement today will  
2 be to make an argument that the proposal on  
3 hydroponics and container growing recommendations  
4 put forward by the crop subcommittee be sent back  
5 to the subcommittee for further discussion.

6           In the proposal put forth, there are  
7 clear regulations that control farming practices  
8 and excludes certain growers, especially in  
9 regards to fertility management.

10           The proposal clearly states that 50  
11 percent of the plant's annual nitrogen needs must  
12 be present in the soil on the day of planting and  
13 then only 20 percent of the additional nitrogen  
14 in that year may be provided for liquid feeding.

15           While this may be possible in certain  
16 annual crops with limited growth time per year,  
17 for perennial crops and site-specific locations  
18 such as Southern California, it does not make  
19 sense.

20           Having a large amount of unavailable  
21 nitrogen in the soil prior to planting reduces  
22 the health of the root zone. By increasing the

1 salinity at the time of the planting and creates  
2 a situation where the availability of nitrogen is  
3 adverse to the needs of the plant.

4 The only thing that this creates is a  
5 situation in which nitrates are pushed past the  
6 root zone and leaks into the soil below the plant  
7 creating a deficit of nutrition that will need to  
8 be corrected with additional inputs in the  
9 future.

10 This also creates a situation in which  
11 many growers will be tempted to inflate their  
12 yearly nitrogen requirements in order to not be  
13 bound by these fertility restrictions.

14 This is not an efficient use of  
15 resources or sound management of the environment.

16 From a purely practical view, the  
17 proposal creates an increased labor need in a  
18 time where labor is one of California  
19 agriculture's largest challenges.

20 Further, what method of revision or  
21 inspections will be used to assure that growers  
22 are complying with these proposed regulations?

1                   Based on the NOSB's past declarations  
2                   that there would be no proposal put forth that  
3                   creates a double standard between allowed  
4                   containers production and soil regulations, I  
5                   believe that this proposal severely limits the  
6                   ability of every organic farmer to make the  
7                   decisions necessary to promote plant health and  
8                   limit environmental impacts.

9                   Thank you for your time and I welcome  
10                  any questions.

11                  MS. ARSENAULT: Tom, you may be still  
12                  on mute again.

13                  MR. CHAPMAN: Yes, that happened  
14                  again, sorry.

15                  Thank you and I see a question from  
16                  Francis.

17                  MR. THICKE: Yes, my question is, can  
18                  you tell us what you use for a substrate from the  
19                  medium that is for a container?

20                  And, secondly, what percent liquid  
21                  feeding do you do with your system?

22                  MR. FARRIS: On both points, it's very

1 difficult to make blanket statement on what  
2 substrates we're using. It's very site specific  
3 based on the crop.

4 And it's very site-specific on  
5 fertility based on the crop. We use --

6 MS. ARSENAULT: I'm sorry to  
7 interrupt, sorry, if I can just interrupt for  
8 just one second. This is Michelle. If you just  
9 joined us, please make sure you're on mute so we  
10 don't hear your background conversations. Thank  
11 you.

12 MR. FARRIS: Yes, okay.

13 So, it's very difficult to make a  
14 blanket statement on which substrates we're using  
15 because it really varies based on perennial or  
16 annual crops. It varies based on the location,  
17 the size of the container.

18 And, on the liquid feeding, also, we  
19 do use both solid and liquid fertility on an as  
20 needed basis in line with our soil production.

21 And I think, to clarify, there's been  
22 a little bit of, at least on my end, a

1 misclarification of what liquid fertility means.

2           And just because it's liquid, does not  
3 mean that it's available to the plant. All of  
4 the liquid fertilizers that we put on still  
5 require a microbial process to take place to make  
6 that nitrogen available to the plant.

7           So, there's a big difference between  
8 liquid and availability to the plant.

9           MR. THICKE: And the liquid would that  
10 be hydrolyzed soybean meal? Would that be one  
11 mix you use?

12           MR. FARRIS: Not particularly. It's  
13 a very expensive product to use. We use mostly  
14 fish based emulsions if we're using a liquid  
15 nitrogen application.

16           But it's always used in conjunction  
17 with solid fertility dependent on the time and  
18 the ease of use of applications.

19           MR. THICKE: So, for the range of  
20 liquid feeding, would you say it's generally 50  
21 percent or more or 80 percent or more?

22           MR. FARRIS: It's really impossible

1 for me to say. It changes year to year, it  
2 changes crop to crop, it changes site to site.  
3 So, for me to make a blanket statement for every  
4 grower is really would be tough for me to do.

5 MR. CHAPMAN: All right, this is Tom.

6 I have a quick follow up question to  
7 make. I hear that -- I see you can't make a  
8 blanket statement, are you able to give a range,  
9 you know, what you use?

10 MR. FARRIS: I mean, it could be  
11 anywhere as high as 50, it can be anywhere as low  
12 as 20 for the nitrogen. You know, it really  
13 depends on the grower because you're applying  
14 these solid fertilizers takes a lot of manpower,  
15 especially on a perennial crop where you might  
16 have to go back in the second year or the third  
17 year, pull a plant out of the pot, add compost to  
18 the pot, put the plant back in. And we already  
19 don't have enough labor as it is even to get the  
20 fruit off of a plant.

21 Trying to add very similar products  
22 that we're adding through the drop tape on the

1 solid basis purely because they're solid, even  
2 though they're very, very similar products, to  
3 me, doesn't make much sense as a regulation to  
4 require growers to take on that extra burden.

5 MR. CHAPMAN: Okay, thank you.

6 I see that Asa is next followed by  
7 Steve, discussions.

8 Asa?

9 MR. BRADMAN: Excuse me, I have two  
10 questions.

11 One, if you look at a little bit more  
12 about nitrogen being forced out of the pot into  
13 the soil and where it goes after that.

14 And then, the second question is, so,  
15 at the end of the cycle or prunings and  
16 trimmings, what happens to that material? Is it  
17 composted? Is it reused in any way? And what  
18 happens to the containers?

19 MR. FARRIS: Sure, on the first part  
20 on the nitrogen being leaked past the roots, that  
21 really is especially important on perennial crops  
22 because we're going to be required now to put 50

1 percent of the nitrogen into the pot and the time  
2 of planting.

3 But, that plant is not going to need  
4 that nitrogen for probably another six to eight  
5 months.

6 So, that microbial activity is going  
7 to start on the solid fertilizers on day one that  
8 the fertilizer is put into the pot.

9 So, that's going to start breaking  
10 down and there's going to be an excess of  
11 nitrogen in the pot creating a high salinity  
12 environment. And then, that fertilizer is just  
13 going to get washed right across the plant in  
14 both containers and soil, the same thing is going  
15 to happen.

16 And then, when the plant does need  
17 that required nutrition six or eight months down  
18 the road, it's already going to be gone. So now,  
19 I have to go back and put on additional inputs to  
20 make up for that.

21 As far as the trimmings, both the used  
22 substrate and our pruned material, the wood,

1 leaves, berries, everything, that all gets  
2 mulched. It gets chopped up and then mulched and  
3 then goes into either compost or green waste,  
4 technically, a green waste system for use in our  
5 in soil field and also in our vermiculture  
6 applications that we have.

7 MR. BRADMAN: Thank you.

8 I have a related question to the  
9 mulching. You know, there's been concerns about,  
10 you know, potentially covering the earth with  
11 more plastic and used as shade cloths and versus  
12 open soil.

13 And, you know, of course, I've seen  
14 mulch films on, you know, lots of soil systems as  
15 well including polyethylene.

16 But, I'm curious, what you use over  
17 the soil, under the pots, between the rows and  
18 how is that managed and, you know, if you're  
19 using, for example, plastics, do you see  
20 alternatives? That sort of thing?

21 MR. FARRIS: Yes, we use -- we have  
22 both systems where we have weed mats directly

1 under the pot and then the in between rows, the  
2 furrows are left open.

3 And then, we do also have a few  
4 locations where we have weed mats covering the  
5 entire portion of the production area, depending  
6 on how heavy the weed structure is.

7 It does, as previously stated, labor  
8 is a big, big concern for us and trying to go  
9 through and take care of that amount of weeding,  
10 it doesn't -- it is not feasible in certain  
11 locations.

12 The other point I would like to make  
13 is, is it better to have a little bit of cover  
14 and ground that's not touched or do you  
15 consistently running a tracker to that every six  
16 months, eight months, a year over a piece of  
17 ground?

18 So, we do use both applications. We  
19 have open areas and we have covered areas, it  
20 just depends on the site.

21 MR. CHAPMAN: Up next, I have Steve,  
22 a question from Steve and a question from

1 Francis.

2 Steve?

3 MR. ELA: Yes, I'd just like to follow  
4 up, I mean, you know, you basically said you  
5 couldn't tell us, you know, how much liquid  
6 feeding versus solid feeding, et cetera in a year  
7 because it varies so much.

8 Yes, I mean, that's really critical  
9 information, but could you at least tell us what  
10 the decision making process is to decide whether  
11 -- which one you're going to use and how you're  
12 going to use them?

13 MR. FARRIS; Yes, absolutely. First  
14 off would be labor. Do we have the amount of  
15 people that we need to go through and put solid  
16 fertility out on 50 acres of blueberries? You  
17 know, that takes -- it's a very costly and labor  
18 -- high labor need practice to do. So, that's a  
19 big portion of the decision making.

20 As I stated before, many of the  
21 products that we're applying are very similar in  
22 the liquid form or the solid form. They're just

1 -- depends on the way that you want to apply it.

2           And the biggest driver for that is  
3 probably labor and then increased efficiency as  
4 well. Because, through the drip in a container  
5 production system, we can be a little bit more  
6 precise on the quantity of fertilizer that we're  
7 adding to each pot versus when it's done solidly,  
8 because people make mistakes, they grab an extra  
9 handful, they grab a little less handful.

10           Through the drip system, it allows us  
11 to be very, very precise with the timing and the  
12 uniformity of our distribution.

13           That does not mean that it makes it  
14 anymore available to the plant uptake any  
15 quicker, it just allows us to apply it more  
16 cheaply and more uniformly.

17           MR. CHAPMAN: All right.

18           We have a question from Francis and  
19 then from Dave Mortensen and then we're going to  
20 have to stop the questions there and move on.

21           So, Francis?

22           MR. ELA: Yes, regarding your concern

1 about leaking of nitrate, what you're talking  
2 about.

3 Now, what if you had instead more  
4 compost in the pot? We've seen research on  
5 systems where they have a 100 percent compost or  
6 a high percentage of compost and there is no  
7 supplemental feeding period solid or liquid.

8 And so, it sounds to me that you're  
9 feeding a lot of liquid because you have  
10 essentially more plant fertility, is that  
11 correct?

12 MR. FARRIS: No, that's not correct on  
13 two points.

14 The first I'd like to make is, we do  
15 use compost in our pots. So, to say that we  
16 don't is false.

17 MR. ELA: On a percent -- what percent  
18 of compost?

19 MR. FARRIS: It may be ten percent, it  
20 depends and then we add in as a top dress  
21 sometimes for weeding. We'll use a green waste  
22 over the top of the pot to try and keep the weeds

1       pressured out a little bit actually in the  
2       container. So, that's adding some increase  
3       microbial activity and nutrition.

4               And then, the second point that I  
5       would like to make on that is the plant can't  
6       heat compost. But, through the biology, that  
7       compost material still needs to be broken down  
8       into a form that the plant can take up through  
9       the liquid.

10              So, it doesn't matter if you're at a  
11       100 percent compost, the method that the plant  
12       eats is still the same. And if that compost is  
13       breaking down before the plant needs it, then you  
14       have all of that energy going right past the  
15       roots and out of the plant.

16              So, making us put that in at a time  
17       when the plant doesn't need it, doesn't seem, to  
18       me, to be the best use of the resources.

19              MR. CHAPMAN: Up next, Dave.

20              MR. MORTENSEN: Yes, thanks, Preston  
21       for the presentation.

22              Could you give us an idea, aside from

1 the nutrition of the plants that you describes,  
2 could you tell us the difference between your  
3 container production system that you've described  
4 and a neighbor who is conventional?

5 MR. FARRIS: Oh, I mean, it would be  
6 huge. Are you saying between conventional in  
7 soil or conventional saying use of non-organic  
8 products?

9 MR. MORTENSEN: A conventional  
10 container production neighbor nearby you, what  
11 would be the biggest differences? I'm just  
12 trying to picture it.

13 MR. FARRIS: Well, I mean, your forms  
14 of nitrogen or your forms of fertility and all  
15 aspects are completely different.

16 A conventional container producer  
17 would be using urea, they would be using pure  
18 ammonia, they would be using calcium nitrate.  
19 They would be spraying with conventional  
20 pesticides.

21 Those are the things that we are not  
22 allowed to do.

1 I think a more fair comparison would  
2 be our organic container production and our  
3 organic soil production. I mean, really, the  
4 only difference between those two is the thing  
5 that the plant roots are sitting in. That's  
6 really the only difference.

7 I mean, the difference between an  
8 organic container production and a conventional  
9 container production is huge. I mean, you can't  
10 even compare the two. All of the tools are  
11 different.

12 MR. MORTENSEN: Thanks.

13 MR. CHAPMAN: I have a quick follow up  
14 to that one.

15 So, are you suggesting that your  
16 inputs are very similar in your in-ground  
17 production of strawberries than they are for your  
18 container production of strawberries?

19 MR. FARRIS: They're almost identical.

20 MR. CHAPMAN: How would they differ?

21 MR. FARRIS: On an as needed basis.

22 You know, in the substrate we have a little bit -

1 - or in the container production, we have a  
2 little bit more ability to manipulate what's  
3 happening before we plant. So, we can jump start  
4 a little bit of the microbial activity.

5 We have a better idea of the processes  
6 that are taking place. Wherein, the soil, it's,  
7 you know, if you have a disease or you have an  
8 issue, it's much harder to address that in the  
9 soil.

10 So, those would be really the only  
11 differences. But, we use, you know, just pretty  
12 much the same products, you know, whatever's  
13 available to us on the labeling are by both the  
14 soil and the container production.

15 I mean, it would be -- if you looked  
16 at a listed input from one of our organic soil  
17 fields and one of organic container fields, and  
18 nobody told you which one was which, you would  
19 not be able to decide.

20 MR. CHAPMAN: Thank you. And I know  
21 I said no more questions, I'm going to throw the  
22 last question to Emily and then we'll have to go

1 on to the next speaker.

2 Emily?

3 MS. OAKLEY: Thanks. Did you unmute  
4 me?

5 MR. CHAPMAN: I did, yes, I think.

6 MS. OAKLEY: Great, thanks.

7 So, you kind of touched on this, but  
8 if you had both in ground and container  
9 production already, what is the benefit to you of  
10 the container production? Why don't you just do  
11 all of your production in the ground?

12 And, Tom, you can put me back on mute.

13 MR. FARRIS: Well, I mean, as you may  
14 know or may not know, here in Southern  
15 California, land is decreasing, you know,  
16 available agricultural land is decreasing every  
17 year.

18 And a lot of the organic ground that  
19 we have has been commercially farmed organically  
20 for quite some time and the ground is a little  
21 bit tired.

22 And it also allows us to take a piece

1 of ground that may not be suited for a particular  
2 cultivar, then you have the really -- you know,  
3 it might be fine organic ground, but it might be  
4 a really heavy clay soil with a high water table.

5 And it wouldn't be very suitable for  
6 growing blueberries, but we can turn that around  
7 and now grow organic blueberries on that same  
8 piece of ground.

9 So, it opens up a lot of new avenues  
10 for an organic farmer to provide quality organic  
11 fruit to the marketplace in a time where that's  
12 becoming more and more difficult to do.

13 And, as a young grower, having new  
14 tools and new opportunities taken away from me  
15 doesn't feel very good. So, it's something that  
16 I feel very passionate about and I hope that all  
17 of these points have been taken into  
18 consideration.

19 MR. CHAPMAN: Okay, thank you,  
20 Preston, thank you for your time with us and  
21 answering all our questions.

22 MR. FARRIS: Thank you very much.

1 MR. CHAPMAN: Up next, I have Zen  
2 Honeycutt followed by Kieran Foran and then Megan  
3 Debates.

4 Zen, are you here? Did you get your  
5 audio working? And we're not hearing you. I'm  
6 just going to check to see if you're mute on your  
7 end.

8 MS. HONEYCUTT: Yes, can you hear me?

9 MR. CHAPMAN: Yes, I can hear you now,  
10 Zen.

11 MS. HONEYCUTT: Okay, is it okay like  
12 this or should I put a headset in?

13 MR. CHAPMAN: No, this is perfect. If  
14 you can start with your name and affiliation and  
15 then you can go straight into your comments.

16 MS. HONEYCUTT: Great.

17 My name is Zen Honeycutt and I'm the  
18 Executive Director of Moms Across America. And I  
19 want to say thank you for listening to me today  
20 and having me on the call.

21 I'm all once are grateful because our  
22 children's lives depend on what all of you do and

1 I just want to say thank you so much.

2 I'm going to speaking from the  
3 perspective of the consumer on hydroponics. And  
4 what we want to say is that we need more  
5 organics. We need more organic, not less. We  
6 need GMO-free and toxin free food.

7 I have driven across the country twice  
8 and have seen a massive deficit of organic food  
9 in the stores.

10 Regarding hydroponics specifically,  
11 our moms prefer organic food to be grown in the  
12 soil and we would like to have the right to  
13 choose between food grown in the soil or water.

14 We do prefer a separate logo for  
15 hydro-organic, meaning, we would like the word  
16 organic to be on it if it is, in fact, organic.

17 So, we are most concerned with the  
18 toxins, however, and we think the surface of the  
19 discussion should be not so much about keeping  
20 organic in the soil, but about keeping the toxins  
21 out of our soil, water and food. And this  
22 contamination issue is being widely ignored and

1 it is a huge problem.

2 So, if you ask any person at a  
3 farmer's market, do you buy produce if it's  
4 pesticide free but not organic? You will almost  
5 always say yes. So, their primary concern is the  
6 toxins in the food, not the label.

7 So, I ask NOSB and the organic  
8 community to consider the following points with  
9 the possibility of incorporating some of the  
10 benefits of hydroponics into organic in order to  
11 further protect consumers.

12 One of the huge benefits of  
13 hydroponics is that the product being grown is  
14 protected from aerial spraying.

15 Many consumers do not trust USDA  
16 Organic now because we know aerial spraying is  
17 happening and because this issue is not being  
18 addressed by the National Organic Program.

19 Number two, another consideration is  
20 the inputs in hydroponics. And we want to make  
21 sure that those are a 100 percent organic.

22 The field grown organics, we are

1 concerned that the glyphosate remaining in the  
2 soil for up to 20 years is impacting the quality  
3 of our food.

4 And also, glyphosate is being found in  
5 rain and irrigation water.

6 With hydroponics, one would have more  
7 control as you could test the water and filter  
8 it, if necessary. Obviously, this cannot be done  
9 with rain.

10 Number three, the last concern in  
11 nutrition. We request NOSB and the organic and  
12 hydroponic organizations test their similar crops  
13 for nutrition levels and let the consumers know  
14 the results.

15 If hydroponic nutrition levels are  
16 comparable in nutrition and a 100 percent of the  
17 organic inputs are used, then hydroponically  
18 grown food could carry the hydro-organic label as  
19 safe for consumption and maybe even less toxic  
20 than organic grown in soil.

21 This may, in fact, be the way of the  
22 future due to our increasing toxic environment

1 and climate change.

2 You know, we ask you to consider that  
3 temperatures are rising and that 50 percent of  
4 the wheat crop will be lost in the Midwest if the  
5 temperature rises, you know, two degrees, this  
6 you know.

7 And we've already lost 50 percent of  
8 the crop. So, just to reiterate, we must  
9 consider that parents depending on food supply is  
10 a real threat when we import 80 percent of our  
11 food, especially soy and that they can  
12 contaminate our soy -- our food.

13 And that we ask to have a separate  
14 label, hydro-organics.

15 MR. CHAPMAN: Thank you, Zen. I'm  
16 going to have to stop you there. So, thank you  
17 for your comments. Any questions from the Board?

18 (No response)

19 MR. CHAPMAN: I'm seeing no questions.  
20 So, Zen, thank you very much for your comments.

21 And we will continue moving down.

22 Next up, I have Kieran Foran followed by Megan

1 Debates and then Peter Overgaag.

2 Kieran, are you here?

3 MR. FORAN: Yes, I'm here. Can you  
4 guys hear me?

5 MR. CHAPMAN: Yes, we can. Can you  
6 start with your name and affiliation for the  
7 record and then proceed with your comments?

8 MR. FORAN: Awesome, thank you very  
9 much to everyone for taking the time to hear all  
10 of our opinions on this important issue.

11 My name's Kieran Foran. I'm from  
12 Trifecta Ecosystems and we're a company that is a  
13 commercial aquaponics growing and we're also have  
14 others in our local communities start their own  
15 aquaponics or hydroponics operations.

16 So, what we did is we sort of started  
17 by taking a poll of our consumers and sort of  
18 seeing what they thought about the organic brand  
19 and sort of what they were looking for with that  
20 brand.

21 And we even chose to pursue advanced  
22 certification just to sort of help the consumer

1 understand how the crops were grown, the way that  
2 communicates that crops are grown with all  
3 organic ingredients and without the use of  
4 harmful chemicals.

5 So, the consumers is willing to pay a  
6 little bit more for these crops and support in  
7 the organic farmer and the organic frame.

8 So, we polled our consumers, the word  
9 they associated most with organic is the word  
10 clean. You know, there isn't a bunch of, you  
11 know, pesticides or herbicides in their food and  
12 that's nothing in there that should be.

13 And the second word that they  
14 associated with the brand was trust. Trust that  
15 there's some sort of standard in place, that puts  
16 this food at a higher standard than  
17 conventionally grown food, whether it contains  
18 GMOs or not.

19 So, that certified organic brand helps  
20 the consumer avoid pesticides. But, even organic  
21 foods, you know, can still end up being grown in  
22 nutrient parsed soils, with some of those poorly

1 managed aquaponics or hydroponic systems.

2 So, it's really the management and the  
3 practices that lead to the healthy product and so  
4 hydro and aquaponics we feel will be grown to  
5 organic standards and using organic inputs.

6 Hydroponic and aquaponic facilities  
7 have been eligible for organic certification for  
8 over 20 years. And anything qualifies that  
9 they're able to follow the same guidelines as  
10 organic crops grown in the ground.

11 You know, to us, organic is really  
12 more about what you don't do. You don't use  
13 synthetic fertilizers or pesticides. You don't  
14 use genetically or GMO seeds.

15 The other thing, is burgeoning or  
16 contamination, you know, you're not getting  
17 sludge on our farm and there's no radiation of  
18 the products.

19 So, all that has led to a burgeoning  
20 interest in organic, especially on the consumer  
21 side of things, which is a real good thing.

22 But there's also a lot pressure on

1 that standard. So, you know, you have products  
2 coming into the market that they minimal level of  
3 what is required sitting right next to another  
4 product that's also labeled organic, but there's  
5 much more.

6 So, we're just, you know, obviously  
7 trying to figure out a way that we can all sort  
8 of make the consumer feel good about what they're  
9 getting is actually what they want.

10 We feel if all of our nutrients are  
11 organic, all of our pesticides and herbicides ,  
12 which we personally don't use for some  
13 hydroponic, then the outcome seems to me it  
14 should be organic.

15 All right, so that was my time?

16 MR. CHAPMAN: Yes.

17 MR. FORAN: Okay.

18 MR. CHAPMAN: Any questions? We  
19 currently have a question from Sue.

20 MS. BAIRD: Yes, hi, I've heard quite  
21 a bit of discussion today on hydroponics,  
22 aquaponics --

1 MS. ARSENAULT: Sue, this is Michelle,  
2 we can barely hear you. If you could speak up  
3 please? Thanks.

4 MS. BAIRD: Is it better?

5 MS. ARSENAULT: Better, thanks.

6 MS. BAIRD: Okay. I've heard a lot of  
7 discussion today on container growing and hydro,  
8 aquaponic growing. Do you have any position on  
9 aeroponic and would you differentiate that  
10 between what we consider to be hydroponic?

11 MR. FORAN: I would not differentiate  
12 it between hydroponic. The main difference is  
13 just how the water gets directed to the root of  
14 the plant.

15 So, in aeroponic, it's usually being  
16 sprayed usually on to the roots, you know, with  
17 some sort of mixer. But, the water itself, you  
18 know, it being managed the same way that a  
19 standard hydroponic farm would be there's just  
20 usually a lot less water involved.

21 So, that can be done with synthetic  
22 fertilizers or that can be done with organic

1 fertilizers.

2 MS. BAIRD: Could I do a follow up  
3 question?

4 MR. CHAPMAN: Yes.

5 MS. BAIRD: Okay. There's been --  
6 we've heard from a lot of aquaponics people and  
7 hydroponics people that said there is a lot of  
8 biological activity in their systems.

9 Would you commit whether that same  
10 biological activity would be present on the  
11 aeroponics because it is in the air?

12 MR. FORAN: Yes, so, as long as the  
13 tanks where they're holding their water is being  
14 properly managed, you know, even, yes, it should  
15 have the same microbiology as you would find in a  
16 standard hydroponic system, but I don't have any  
17 personal experience with that.

18 But, there have been numerous studies  
19 and they have found that hydroponic systems and  
20 aquaponic systems compare to the microbial  
21 activity of compost.

22 So, there are very microbial active

1 and there's no reason that an aeroponics system  
2 should be any different.

3 MS. BAIRD: Okay, thank you.

4 MR. CHAPMAN: Thank you very much for  
5 your comments, Kieran.

6 We're going to move on, next up, I  
7 have Megan Debates followed by Peter Overgaag.  
8 Peter, if you're still here, we do not see you  
9 online anymore. Please message us.

10 After Peter, we will have Joel Kelly  
11 and Tim Mann.

12 Megan, are you here?

13 MS. DEBATES: Hi, Megan Debates,  
14 Director of Legislative Affairs and Coalitions  
15 for the Organic Trade Association.

16 I want to specifically comment on  
17 NOSB's proposed guidance on excluded operations.  
18 OTA is extremely supportive of NOSB's efforts to  
19 address the critical issue of organic fraud.

20 And we are generally in support of  
21 this proposal. We strongly believe that a  
22 regulatory modification to limit the types of

1 operations that may be excluded from  
2 certification is imperative.

3 But, in addition, we also support the  
4 important role guidance and training have and  
5 strengthening and clarifying the regulations.

6 Acknowledging that this is one of many  
7 actions that must be taken to adequately address  
8 organic fraud, OTA supports passing the proposal  
9 of this meeting.

10 Going forward, we encourage NOSB to  
11 work on identifying the types of operations that  
12 must be certified, be it a modification to the  
13 regulations along with any additional guidance  
14 that may be needed within NOP 50-31 or beyond.

15 OTA has been pursuing legislative  
16 changes for the next Farm Bill to give NOP the  
17 tools it needs to prevent fraud.

18 Our direction is shaped by a survey we  
19 conducted through which over 500 organic  
20 stakeholders communicated that a top priority is  
21 a stronger program to increase the transparency  
22 and tracking of international trade.

1                   As a result, about a month ago,  
2                   Representative John Faso introduced the Organic  
3                   Farmer and Consumer Protection Act.

4                   Most relevant to the NOSB proposal we  
5                   are discussing today is that the legislation  
6                   requires USDA to close regulatory loopholes by  
7                   mandating that uncertified entities such as  
8                   ports, brokers, importers and online auctions  
9                   become certified.

10                  The legislation achieves this goal by  
11                  calling for a modification to the regulations to  
12                  limit the type of operations that are excluded  
13                  from certification.

14                  The language in the bill imposes a  
15                  deadline of no later than one year of passage of  
16                  the Farm Bill for USDA to issue these  
17                  regulations.

18                  We bring this legislative action to  
19                  the attention of NOSB because of the obvious and  
20                  important intersection it has with NOP's request  
21                  to NOSB to provide recommendations on improving  
22                  the oversight and control procedures to verify

1 organic claims for imported products.

2 We also acknowledge that with the new  
3 administration and transition taking place, that  
4 rulemaking can be delayed.

5 If the NOSB decides to propose changes  
6 in the future that require rulemaking to address  
7 the issue of operations that are currently  
8 excluded from certification, OTA supports that  
9 path.

10 The legislative language proposed for  
11 the Farm Bill compliments NOSB's work on this  
12 issue and reinforces that action should be taken  
13 on this matter sooner rather than later and  
14 provides the backstop to ensure that rulemaking  
15 takes place in a timely manner via congressional  
16 oversight.

17 Thank you for the opportunity to  
18 provide comments on this proposal and share our  
19 perspective.

20 MR. CHAPMAN: Thank you. Any  
21 questions for Megan?

22 (No response)

1           MR. CHAPMAN: Hearing none, Megan,  
2 thank you for your comments. Up next, we have  
3 Peter Overgaag. Peter, are you here?

4           MR. OVERGAAG: Yes, I am. I lost my  
5 connection, but I am on the phone and ready.

6           MR. CHAPMAN: Okay, Peter, if you --  
7 after Pete, we have Joel Kelly and then Tim Mann.

8           If you can start with your name and  
9 affiliation.

10          MR. OVERGAAG: Okay, I'm Pete Overgaag  
11 from Hollandia Produce. We're a certified  
12 organic hydroponic grower of lettuce and crisp  
13 products. We're an e-shop, so 100 percent  
14 employee owned. So you could say our employees  
15 are actually a group of 150 small farmers.

16          Through all of these discussions about  
17 what should or shouldn't be called organic,  
18 everyone has become so fixated on their own  
19 business needs that they have seemingly all but  
20 forgotten about the end consumer.

21          By limiting organic certification in  
22 soil based plants only, you are essentially

1 reducing availability in products that are  
2 healthier, better for the environment, for small  
3 farmers and for the climate.

4 Consumers have come to understand that  
5 organic means all natural inputs and nothing  
6 synthetic.

7 Our growing process results in  
8 products that deliver everything consumers care  
9 about when shopping for organic products. And,  
10 in some cases, they are actually safer for the  
11 consumer, and here's why.

12 We use all natural inputs, nothing  
13 synthetic, no chemicals, no exceptions. So,  
14 everything we give our clients is the same as  
15 growers whose plants are in the earth. The only  
16 difference that there are no grains of sand  
17 around our roots, for the rest, everything's the  
18 same.

19 Just like in the soil, we have the  
20 whole ecosystem of natural bacteria  
21 microorganisms living in -- corresponding around  
22 the roots of the plants.

1           So, all natural inputs, nothing  
2           synthetic in a natural ecosystem for our plants  
3           results in clean, healthy produces for our  
4           consumers.

5           In many cases, our products are  
6           cleaner, safer and healthier than plants grown in  
7           the earth. This is because we control the inputs  
8           but plants only have access to the already  
9           approved natural inputs that we give them.

10           An example of this would be cadmium.  
11           There are farming regions in the USA that have  
12           naturally high levels of cadmium in the soil,  
13           either the natural volcanic makeup of the soil.

14           The cadmium, of course, ends up in the  
15           vegetables that are growing in it.

16           And, you may have heard, cadmium is  
17           referred to as the new lead. It is a heavy metal  
18           known to cause learning disabilities in children  
19           and many other negative health effects.

20           I urge the NOSB to keep it simple by  
21           supporting modern, cleaner, more sustainable and  
22           healthier measures of growing by supporting

1 certified organic hydroponics, aquaponics,  
2 aeroponics and container growing.

3 If soil growers believe their products  
4 are different, they should come up with their own  
5 designation such as soil grown and stop trying to  
6 complicate and change the organic program.

7 Thank you.

8 MR. CHAPMAN: Any questions?

9 MS. ARSENAULT: Tom, if you're  
10 talking, you're on mute.

11 MR. CHAPMAN: Sorry. All right, so I  
12 have a few questions from Asa and Francis. I'm  
13 going to stop it there, we're running out of  
14 time. So, keep it short.

15 So, Asa, then Francis, then if they  
16 can response short as well, that would be  
17 appreciated.

18 MR. BRADMAN: Hey, just a quick  
19 question about labeling. It's come up now a  
20 couple times in today's discussion that, you  
21 know, to have like an organic hydroponic, organic  
22 aeroponic. And I wonder what you are -- an

1 opinion on that one is.

2 MR. OVERGAAG: I think it's wiser to  
3 keep it simple and instead of having lots of  
4 different designations that, if farmers who are  
5 growing this soil that they can mark it soil  
6 grown and let the consumers decide.

7 So, I would lean in that direction.

8 MR. BRADMAN: Thank you.

9 MR. CHAPMAN: Francis?

10 MR. MORTENSEN: Yes, in your lettuce  
11 growing, can you tell us what you use for a  
12 substrate and what percent liquid feeding you  
13 use?

14 MR. OVERGAAG: So, we start our seeds  
15 in a small cube of it's about an inch and a half  
16 by inch and a half. And it's mainly peat moss  
17 and we add other nutrients, a little bit of  
18 compost, castings and those type of things.

19 But, of course, the cube being so  
20 small and not -- it's not a high percentage of  
21 what the plants need. Because, in our case, our  
22 -- most of the growing is done in the water.

1 MR. MORTENSEN: Thank you, Pete.

2 MR. CHAPMAN: Okay, we're going to  
3 have to stop the questions there and move on to  
4 our next commenter.

5 Next up is Joel Kelly. Joel, are you  
6 on the line with us?

7 MR. KELLY: I am, can you hear me  
8 okay?

9 MR. CHAPMAN: Yes. And then after  
10 Joel will be Tim, that'll be our last commenter  
11 for the day.

12 Joel, if you could start with your  
13 name and affiliation and then go to your  
14 comments?

15 MR. KELLY: Okay, my name is Joel  
16 Kelly and I'm an organic aquaponics farmer from  
17 Portland, Oregon.

18 Although I believe there are great  
19 arguments to be made for organic certification in  
20 aquaponics and hydroponics based on biology and  
21 sustainability, I do not consider myself an  
22 expert in these areas. I'm an entrepreneur and

1 I'm classically trained at reading market trends  
2 and monitoring the potential outcomes of  
3 strategic decisions.

4 This will be my primary in this  
5 statement.

6 In 2009, the Sahara Force Project  
7 estimated the world population would climb to 9.5  
8 billion people by 2050.

9 Hydroponics and aquaponics have  
10 potential to help feed this growing population.

11 This as well also estimated that the  
12 hydroponics food industry has grown an average of  
13 4.5 percent per year for the past five years and  
14 that number is expected to grow exponentially  
15 over the next five years.

16 Basically, it's clear that the  
17 hydroponics industry is here to stay and the  
18 industry is going to take a significant market  
19 share over the next 10 to 20 years.

20 You, the members of the NOSB, have the  
21 responsibility to help better decide what this  
22 new potentially massive industry is going to look

1 like.

2 Some seem to want to paint the picture  
3 that this issue is about big ag farms wanting to  
4 steam the organic market from, quote, unquote,  
5 real organic farmers.

6 Like the soil farming industry, there  
7 are farms in the soilless industry if you use  
8 methods requiring chemicals and unsustainable  
9 practices.

10 However, many certified organic  
11 soilless farms like mine, a family owned farm  
12 with 15 employees see aquaponics as a way to  
13 provide healthy chemical-free and non-GMOs  
14 sustainability grown produce.

15 To communicate these values to our  
16 customers, we've become certified organic and  
17 there's no other way to communicate these values  
18 on the market today like the term certified  
19 organic.

20 If we weren't able to use the word  
21 organic to communicate this to our customers, we  
22 would lose our advantage against farms in our

1 industry who use worst practices and have a lower  
2 price.

3 Farms like mine would then be forced  
4 to either go out of business or sacrifice our  
5 values in order to compete.

6 Think for a moment about what this  
7 would create. We need you to consider the  
8 possibility that a large portion of our food  
9 supply someday could come from soilless farms.

10 So, we want this industry to be  
11 dominated by farms using low costs, unsustainable  
12 methods with no incentive to use organic  
13 practices, an industry in which the only  
14 incentive is to create the lowest priced products  
15 regardless of the quality or what it does to the  
16 environment.

17 This to me seems short-sighted. In  
18 today's day and age, we need to encourage as many  
19 people as possible to grow organically. I think  
20 we can all agree that increasing the number of  
21 farmers who use organic methods, that are good  
22 for the planet and the consumer would be better

1 for everyone.

2 I propose that we allow soilless  
3 farmers to use the word organic on their label  
4 and require that they label their products with  
5 their growing method.

6 Let the consumers decide if they want  
7 to buy -- if they don't want to buy our produce  
8 because it's grown without soil. I can tell you  
9 from experience handing out pamphlets, talking to  
10 customers and giving tours to thousands of people  
11 that our customers love what we do.

12 Thank you.

13 MR. CHAPMAN: Thank you, Joel. Any  
14 questions for Joel?

15 (No response)

16 MR. CHAPMAN: Seeing none, we'll move  
17 on to our last speaker just under the wire. Tim  
18 Mann, are you on the line?

19 MR. -- I am on the line. Can you  
20 hear me?

21 MR. CHAPMAN: Yes, we can. Tim, if  
22 you can start with your name and affiliation and

1 then go into your comments.

2 MR. MANN: Great, my name's Tim Mann.

3 I have a farm called Friendly Aquaponics,  
4 Incorporated in Hawaii with my wife and we have  
5 been aquaponics farmers for the last ten years.

6 My wife's farm was the first in the  
7 world to get USDA organically certified through  
8 Oregon Tilth in 2008 and certified again two  
9 years later to the Organic Certifiers in Southern  
10 California, two of the biggest certifiers in the  
11 U.S.

12 We've taught hundreds of students in  
13 our commercial aquaponics courses how to get  
14 organically certified. And many of them have.

15 If aquaponics was not inherently  
16 certifiable, then I believe these two certifying  
17 agencies would never have certified us nor any of  
18 our students.

19 In fact, aquaponics may be more  
20 ecologically sound and sustainable than organic  
21 soil growing because of the following reasons.

22 Number one, we recirculate all our

1 water and use as little as five percent of what's  
2 used in soil growing.

3           Number two, we use much less energy  
4 that growing in the soil, possibly as little as  
5 one-quarter as much. And energy used is  
6 electrical and can be provided from renewable  
7 energy sources. You don't use any diesel,  
8 period. And we don't pollute.

9           Three, because we grow so densely, we  
10 have land area requirements of only one-tenth as  
11 much as growing in soil.

12           Four, because we don't need soil to  
13 plant, we can use infertile or marginal land that  
14 the soil farmers can't use.

15           Separate from this testimony, I'd be  
16 happy to send you our research and course that  
17 illustrates how aquaponics and build soil within  
18 five years from soil that was previously all rock  
19 and gravel.

20           Next, we can farm on rooftops and  
21 inside buildings and where our communities need  
22 the food and where no fields exist for soil

1 farming.

2 Next, organic soil growing depends on  
3 the farmer's integrity to the produce to be truly  
4 organic. And, according to some of the USDA's  
5 own reports, a number of importers and even some  
6 domestic producers cheat.

7 In addition, there is the issue of  
8 toxic conventional over spray on to organic  
9 fields from aerial sprayers which you heard about  
10 earlier in this conversation, which soil growers  
11 cannot prevent.

12 In contrast, aquaponics is mostly done  
13 inside greenhouse so to protect the crops with a  
14 barrier from any aerial spraying.

15 Also, it's impossible for an unethical  
16 aquaponics farmers to cheat their system because  
17 their fish would die if we used any unapproved  
18 substances.

19 Last, aquaponics grows protein also in  
20 the form of fish which is very difficult to do in  
21 the soil.

22 With the NOSB denies organic

1 certification for aquaponics, we may end up in a  
2 long series of legal battles when I hear you've  
3 deniers and the organic aquaponics community.  
4 And no one needs that.

5 I'm almost done, by relaxing, letting  
6 go of our fears and working together. Don't we  
7 all have better things to do with our time?

8 And, finally, thanks for your time.

9 MR. CHAPMAN: Thank you, Tim. Any  
10 questions for Tim?

11 (No response)

12 MR. CHAPMAN: Seeing none, Tim, I  
13 would appreciate if you could send that research  
14 that you mentioned to Michelle.

15 MR. MANN: I'm happy to.

16 MR. CHAPMAN: And that concludes our  
17 last public comment. So, we're just over our  
18 time here at 1:03 Pacific Time.

19 I want to thank all members of the  
20 public for your thoughtful comments and would  
21 like to thank the members of the Board for their  
22 time and questions, their attention as well.

1                   And, lastly, thank the National  
2 Organic Program for facilitating this meeting. I  
3 think it went fairly smoothly.

4                   So, with that, we'll be standing in  
5 recess until our next public comment session on  
6 Thursday at 1:00 p.m. Eastern Time.

7                   Thank you, everyone.

8                   MS. ARSENAULT: Thank you. Thanks,  
9 Tom, for everything, great job. Thank you  
10 everyone for keeping it nice and quiet out there.

11                   All right, I'm going to disconnect the  
12 line.

13                   (Whereupon, the above-entitled matter  
14 went off the record at 4:04 p.m.)

15  
16  
17  
18  
19  
20  
21  
22

<b>A</b>		
<b>A-B-D-E-L-J-A-L-I-L</b> 93:20	<b>add</b> 85:14 146:17,21 153:20 179:17	165:6 175:9 180:13 184:22
<b>A-Dae</b> 1:20 9:17,20 30:18	<b>added</b> 11:18 19:6	<b>affiliations</b> 7:9 14:12
<b>Abdeljalil</b> 93:20 101:17 101:19	<b>adding</b> 79:9 88:14 89:9 128:4,17 129:4 146:22 152:7 154:2	<b>affordable</b> 41:12 42:17
<b>ability</b> 35:8 84:16 132:6 138:9 143:6 157:2	<b>addition</b> 12:15 53:5 54:11 55:7 80:9 137:4 172:3 187:7	<b>afternoon</b> 56:14 83:13 94:11 140:16
<b>able</b> 17:2 23:1 42:4 48:4 85:19 98:2 117:8 118:8 126:2 131:20 132:9,17,18 133:5 136:21 146:8 157:19 167:9 182:20	<b>additional</b> 52:22 104:6 122:22 129:5 138:3 141:13 142:8 148:19 172:13	<b>ag</b> 182:3
<b>above-entitled</b> 189:13	<b>address</b> 26:16 27:7 29:10 36:1 55:10 56:20 79:16 81:20 87:16 138:18 157:8 171:19 172:7 174:6	<b>age</b> 183:18
<b>absolutely</b> 25:17 52:7 151:13	<b>addressed</b> 32:19 54:3 103:20 162:18	<b>agencies</b> 185:17
<b>academia</b> 23:19	<b>addresses</b> 23:8	<b>agenda</b> 35:1
<b>academic</b> 103:1 105:5	<b>addressing</b> 88:13	<b>ago</b> 173:1
<b>accept</b> 22:8	<b>adds</b> 28:10	<b>agonizing</b> 71:1
<b>acceptance</b> 131:12	<b>adequate</b> 12:21 19:17 58:15	<b>agree</b> 53:5 54:2 119:22 183:20
<b>accepted</b> 110:10,10,14	<b>adequately</b> 105:14 172:7	<b>agreement</b> 66:3
<b>access</b> 6:1 11:5 24:3 41:11 42:14 49:9 54:13 78:9 177:8	<b>Adjourn</b> 3:16	<b>agricultural</b> 27:11 42:12,20 106:6 116:3 158:16
<b>accessible</b> 46:15,16	<b>administration</b> 35:2 174:3	<b>agriculture</b> 1:1 21:1,10 48:17,21 65:17 66:9 72:16 73:6,9,12,15 74:16 102:22
<b>accomplished</b> 17:17	<b>administratively</b> 11:19	<b>agriculture's</b> 142:19
<b>accredited</b> 52:10	<b>admit</b> 78:7	<b>agronomic</b> 105:6
<b>accumulate</b> 69:12 80:16	<b>adopting</b> 106:21	<b>ahead</b> 86:22 91:3 102:8 112:8 121:16 135:13
<b>accuracy</b> 44:19	<b>adoption</b> 85:15	<b>aimed</b> 104:3
<b>achievable</b> 34:11	<b>advanced</b> 165:21	<b>air</b> 64:13 67:14 170:11
<b>achieves</b> 173:10	<b>advancements</b> 42:15	<b>alarmed</b> 64:22
<b>acid</b> 18:21 115:22 116:2	<b>advantage</b> 182:22	<b>Alexis</b> 63:16,17,19 64:1 82:18
<b>acknowledge</b> 21:2 52:16 54:16 139:7 174:2	<b>adverse</b> 142:3	<b>alfalfa</b> 94:16 98:11,13 99:17,19,22
<b>Acknowledging</b> 172:6	<b>advice</b> 5:18	<b>alike</b> 16:12
<b>acres</b> 55:1 100:21 151:16	<b>Advisory</b> 2:12 5:3	<b>Alliance</b> 98:1
<b>Act</b> 5:4 16:10 19:21 20:12 173:3	<b>advocate</b> 65:19	<b>allow</b> 26:13 88:5 112:4 118:18 184:2
<b>action</b> 83:17 84:5,16 85:2 90:8 137:18 173:18 174:12	<b>aerial</b> 162:14,16 187:9 187:14	<b>allowance</b> 57:22
<b>actions</b> 86:3 172:7	<b>aeroponic</b> 53:15 169:9 169:15 178:22	<b>allowed</b> 81:15 88:8,12 116:9 120:5 143:3 155:22
<b>active</b> 170:22	<b>aeraponics</b> 170:11 171:1 178:2	<b>allowing</b> 14:15 96:1,11
<b>activities</b> 4:20 38:17 109:20 129:1	<b>Affairs</b> 171:14	<b>allows</b> 80:3 112:8 152:10,15 158:22
<b>activity</b> 59:3 123:9 124:20 129:3 148:6 154:3 157:4 170:8,10 170:21	<b>affect</b> 38:12 116:9	<b>alternate</b> 57:18 59:18 60:15
<b>actual</b> 25:1 90:10	<b>affidavit</b> 36:5	<b>alternative</b> 103:12 104:4
<b>AD</b> 29:18,20	<b>affiliated</b> 51:9	<b>alternatives</b> 12:11,13 149:20
<b>adapted</b> 11:6	<b>affiliation</b> 7:7 10:18 27:1 31:7 39:17 44:1 52:5 56:13 63:18 83:9 86:17 102:16 109:5 115:16 118:1 121:12 135:8 140:14 160:14	<b>Amalie</b> 63:17 83:1,1,6 83:11
<b>adaptive</b> 58:18		<b>Amalie's</b> 115:21
		<b>amazing</b> 17:18
		<b>Amber</b> 102:14 108:22 114:9,9,11,17,20,21 115:2,9 117:10,17 118:2 119:7,8,10
		121:3
		<b>ambiguous</b> 133:21
		<b>America</b> 72:1 160:18
		<b>Ames</b> 94:14
		<b>ammonia</b> 88:16 92:2,4 155:18
		<b>amount</b> 33:18 68:12 113:10 141:20 150:9 151:14
		<b>Anaerobic</b> 29:16 30:1
		<b>Analyst</b> 2:17,20
		<b>ancillary</b> 51:13
		<b>angle</b> 139:12
		<b>animal</b> 54:15
		<b>animals</b> 49:8 58:11 85:18
		<b>annotation</b> 116:16 120:1
		<b>annotations</b> 116:7 119:4,5
		<b>announce</b> 63:8
		<b>annual</b> 122:10 123:13 127:11,12 141:11,16 144:16
		<b>answer</b> 46:3 127:20 131:20 132:5,22
		<b>answering</b> 135:2 159:21
		<b>anybody</b> 17:20
		<b>anymore</b> 152:14 171:9
		<b>apologize</b> 120:20 127:7
		<b>apparently</b> 68:10
		<b>appear</b> 58:19
		<b>appeared</b> 134:13
		<b>apple</b> 33:11
		<b>apples</b> 37:16
		<b>application</b> 25:2 145:15
		<b>applications</b> 145:18 149:6 150:18
		<b>apply</b> 152:1,15
		<b>applying</b> 146:13 151:21
		<b>appreciate</b> 4:10 12:2,15 32:1 33:6 34:4 52:13 53:21 57:4 59:1,7 78:18 81:9 82:20 84:5 103:6 109:13 114:5 118:5 120:22 188:13
		<b>appreciated</b> 140:10 178:17
		<b>appreciates</b> 34:3
		<b>appreciative</b> 18:2
		<b>approach</b> 41:8 53:5,17 59:1 95:21 99:3,15
		<b>appropriately</b> 49:22
		<b>approval</b> 136:19
		<b>approve</b> 37:10 67:12 74:20
		<b>approved</b> 177:9

**approximately** 56:16  
122:5  
**April** 32:15  
**aquaponic** 39:22 41:21  
42:7,18 43:1,4 53:16  
86:20 88:14 89:13  
90:7 91:20 167:6  
169:8 170:20  
**aquaponically** 131:3  
**aquaponics** 40:2,12,16  
41:5 42:5 49:19 50:10  
87:14 89:7,15 91:21  
92:10,15 117:6  
133:17 165:13,15  
167:1,4 168:22 170:6  
178:1 180:16,20  
181:9 182:12 185:3,5  
185:13,15,19 186:17  
187:12,16,19 188:1,3  
**area** 36:7 43:12,13  
87:16 102:5 109:14  
110:10 120:8 124:14  
150:5 186:10  
**areas** 19:10 43:3,3  
54:20 110:6 118:19  
118:20 120:7 122:19  
124:6 136:1 150:19  
150:19 180:22  
**arena** 72:9  
**arenas** 51:4  
**argue** 48:11  
**argument** 66:10 141:2  
**arguments** 180:19  
**Arizona** 72:1  
**Arsenault** 2:12 3:9 8:7  
8:11,14,17,19 9:1,3,6  
9:9,12,15,17,20,22  
10:3,10 14:4 25:11,14  
43:11 62:6,11,20 63:1  
63:5,11 90:13 101:19  
101:21 102:4,7 111:3  
114:11 120:14,18,22  
143:11 144:6 169:1,5  
178:9 189:8  
**artificial** 54:4,9,11  
73:18 74:3 79:20  
81:21,22  
**Asa** 1:14 8:14,17 24:11  
70:12,13,21 119:9  
130:16 147:6,8  
178:12,15  
**Ashley** 1:12 9:22 18:6  
35:15 60:1 67:19  
68:19 100:4,5 111:7  
114:2  
**aside** 57:17 60:14  
154:22  
**asked** 7:6 74:7 114:2,4

**asking** 49:1 75:3 93:17  
113:22 117:5  
**asks** 52:22  
**aspect** 72:17 73:2  
**aspects** 155:15  
**assert** 78:20 79:12  
**assess** 58:6 104:10  
**assist** 5:5  
**Assistant** 2:15 115:18  
**Associate** 102:18  
**associated** 46:12 51:8  
166:9,14  
**Association** 40:2 64:3  
65:16 66:20 83:12  
171:15  
**assure** 142:21  
**ate** 65:12,13 78:4,5  
**atmosphere** 66:6 73:11  
**attack** 16:22  
**attention** 58:5 84:19  
105:4 173:19 188:22  
**attitudes** 77:21  
**auctions** 173:8  
**audio** 10:13 115:9  
117:19 160:5  
**audit** 84:11  
**auditable** 36:4,9  
**auspices** 5:3  
**Austin** 10:16 14:10,13  
14:14 18:14 20:16  
**authority** 11:21 34:14  
**availability** 142:2 145:8  
176:1  
**available** 8:3 87:8 145:3  
145:6 152:14 157:13  
158:16  
**avenues** 159:9  
**average** 181:12  
**avoid** 15:22 59:14  
95:16 166:20  
**aware** 68:17 74:17  
**Awesome** 165:8

---

**B**

**back** 22:15 33:15 38:10  
38:22 51:1 66:6  
100:12,22 124:11  
141:4 146:16,18  
148:19 158:12  
**backed** 88:18  
**background** 111:5  
144:10  
**backstop** 174:14  
**bacteria** 88:15 92:4,20  
176:20  
**Baden-Mayer** 63:20  
64:1,2 68:5 69:3 70:5  
72:14 75:16 77:18

80:6 82:2,12  
**bag** 99:6  
**bags** 97:12 100:21  
**Baird** 1:13 8:8,10 78:17  
81:9 82:7 114:1  
168:20 169:4,6 170:2  
170:5 171:3  
**barely** 169:2  
**barrier** 187:14  
**base** 81:18 122:2  
**based** 25:3 27:21 30:4  
50:13 94:14 96:18  
118:11 119:12 122:9  
124:10 140:18 143:1  
144:3,5,15,16 145:14  
175:22 180:20  
**BASF** 20:22 23:21 27:4  
**basically** 109:10 131:1  
151:4 181:16  
**basis** 13:16 106:2  
144:20 147:1 156:21  
**bathing** 80:12  
**battles** 188:2  
**beans** 94:15  
**becoming** 159:12  
**bedding** 53:20  
**beginning** 6:15 136:8  
**behalf** 5:18  
**Behar** 1:14 8:12,13  
25:21 26:1,17 34:18  
34:20 35:11 47:16  
60:21 61:1,18 97:6  
98:17 129:9  
**behold** 99:7  
**belief** 11:14  
**believe** 47:19,21 54:7  
56:9 69:3 74:16 95:5  
104:19 133:11 134:4  
143:5 171:21 178:3  
180:18 185:16  
**belts** 19:7,8  
**beneficial** 107:8,16  
108:3  
**benefit** 14:18 28:7 42:8  
42:10,18,22 98:7  
158:9  
**benefits** 21:16,18,22  
22:21 23:7 43:4 75:13  
78:12 104:12 107:5  
107:22 162:10,12  
**Berkeley** 107:14  
**berries** 33:11 71:22  
149:1  
**berry** 140:21  
**best** 13:6 58:17 66:4,10  
82:3 95:14 105:7  
126:9 132:6 154:18  
**better** 13:9,9 23:17

46:17 48:13 50:20  
51:6 57:21 58:1,6  
60:5 63:5 85:3 150:13  
157:5 169:4,5 176:2  
181:21 183:22 188:7  
**beyond** 49:1,7 72:12  
80:16 172:14  
**big** 29:9 41:9 88:21  
145:7 150:8,8 151:19  
182:3  
**bigger** 71:11  
**biggest** 118:12 152:2  
155:11 185:10  
**bill** 172:16 173:14,16  
174:11  
**billion** 181:8  
**bin** 37:3,8  
**binomial** 116:12  
**bins** 19:1,1,5  
**biodegradable** 23:6,12  
24:1,3,6,14 27:8 29:6  
29:12 30:10,14 55:12  
**biodegrades** 26:3  
**biodiversity** 54:22  
104:8,11,21 106:20  
106:21 107:4,22  
124:2 129:10  
**biological** 40:22 81:18  
123:9 124:20 129:1,3  
170:8,10  
**biologically** 79:13  
**biologics** 58:2  
**biology** 88:18,20 92:1  
93:3,4 154:6 180:20  
**bioplastic** 26:2  
**biopolymer** 26:11  
**biopolymers** 20:22  
27:4  
**bird** 12:22  
**birds** 107:17  
**bit** 7:1 18:9,12 49:19  
61:11 106:19 111:12  
119:13 144:22 147:11  
150:13 152:5 154:1  
156:22 157:2,4  
158:21 166:6 168:21  
179:17  
**blackberries** 122:7  
**blanket** 144:1,14 146:3  
146:8  
**blend** 73:20  
**blight** 16:21,21,22 17:9  
17:9 18:19  
**Blue** 94:12,13 95:3 99:2  
**blueberries** 122:6  
151:16 159:6,7  
**board** 1:3,8,10 4:5,9,12  
4:15 5:2,6,13,19 7:10

7:17,21 8:6 11:13,15  
 13:15,17 24:5,7 27:5  
 30:18,22 52:16 67:18  
 70:19 75:15 76:15,16  
 82:16 86:7 87:15 88:8  
 90:22 93:11 101:5  
 106:12 108:6,16  
 110:19 117:5,16  
 118:7,9 119:4 121:4  
 125:5 131:6 134:21  
 164:17 188:21  
**Board's** 4:16  
**boards** 105:12  
**body** 27:18  
**bomb** 76:11  
**boost** 129:5  
**botched** 86:13  
**bound** 142:13  
**Bradman** 1:14 8:15,16  
 24:11,11,18 25:6  
 70:22 74:22 119:10  
 119:20 120:11 130:17  
 132:1 147:9 149:7  
 178:18 179:8  
**brand** 99:5 100:22  
 165:18,20 166:14,19  
**brands** 101:3  
**break** 78:2  
**breaking** 19:13 148:9  
 154:13  
**breeding** 12:16 13:1,4,5  
**Brian** 26:21 31:5,5  
 39:12,16,21 43:6,7,7  
 44:11 45:7 46:15  
**BRIDGET** 2:20  
**brief** 70:15  
**briefly** 119:3  
**BRINES** 2:14  
**bring** 5:11 51:14 61:2  
 103:8 173:18  
**brings** 42:3  
**broad** 45:21  
**broader** 48:22 51:4  
**broken** 154:7  
**broker** 137:6  
**brokers** 137:12,16  
 173:8  
**Brothers** 140:18  
**brushes** 19:7  
**Buie** 1:12 8:17,18  
**build** 47:4 186:17  
**build-up** 16:1  
**building** 45:13,14 46:7  
**buildings** 186:21  
**builds** 92:3  
**built** 58:16  
**bulk** 33:18  
**bunch** 166:10

**bundled** 8:2  
**burden** 33:21 36:18  
 53:8 147:4  
**burgeoning** 167:15,19  
**buried** 126:16  
**burned** 22:13  
**business** 7:9 27:4 42:2  
 44:15 175:19 183:4  
**busy** 14:22  
**butcher** 62:3 93:19  
 101:17  
**butchered** 86:13  
**butchering** 62:15  
**button** 5:17 6:11 30:20  
**buy** 20:2 40:7 47:18  
 64:21 65:8 97:11  
 162:3 184:7,7  
**buying** 97:12  
**buzzer** 7:15,19  
**bypassing** 80:9

---

**C**


---

**C-O-N-T-E-N-T-S** 3:1  
**CACS's** 15:4  
**cadmium** 177:10,12,14  
 177:16  
**calcium** 155:18  
**calculate** 71:19 74:9  
 123:22  
**calculated** 106:1  
**calculating** 72:8 74:15  
**California** 71:3 72:2  
 84:20 140:19 141:18  
 142:18 158:15 185:10  
**call** 3:8 8:1,6 35:1 82:22  
 160:20  
**called** 4:11 6:17 7:6  
 36:5 175:17 185:3  
**calling** 6:21 173:11  
**cancer** 65:3 80:20  
**capacity** 73:4 76:4  
**carbon** 49:11 66:1,5,5  
 66:15,17 67:8 71:20  
 72:8 73:5,10,17,21  
 74:9,15 75:3,13,18  
 76:5,8,10 77:7 105:20  
 106:3,3,8  
**care** 40:10,14 47:17,21  
 77:16 111:10 150:9  
 176:8  
**careful** 95:13 99:13  
**carefully** 11:16  
**carry** 163:18  
**carrying** 35:4  
**case** 30:10 37:21  
 179:21  
**cases** 22:13 28:9 59:19  
 176:10 177:5

**castings** 179:18  
**catch** 126:17  
**catch-all** 139:5  
**cause** 65:1,20 78:14  
 177:18  
**caveat** 67:14  
**CCOF** 31:16 34:3,9  
 37:10 109:8 111:18  
 114:19 115:18 116:4  
 116:10,15,17 117:1,4  
 118:4,10 121:15,22  
 122:21 125:19 130:19  
 131:14  
**celery** 104:4  
**cell** 32:8  
**Center** 65:9 77:20,20  
 102:19  
**centered** 137:20  
**central** 72:15  
**certain** 136:5 141:8,15  
 150:10  
**certainly** 46:5 48:4,19  
 69:7 71:2,10 72:7  
 77:1  
**certifiable** 185:16  
**certification** 11:4 27:18  
 34:13 42:6 52:8,10  
 56:15 61:5 85:20  
 109:8 118:3 121:14  
 133:15 136:1,22  
 165:22 167:7 172:2  
 173:13 174:8 175:21  
 180:19 188:1  
**certified** 33:7 36:21  
 38:4,5 44:3 52:15  
 53:14 55:9 56:19 85:7  
 118:18,21 122:13  
 125:12 126:4 129:17  
 132:9 136:15 137:8,9  
 138:1 166:19 172:12  
 173:9 175:11 178:1  
 182:10,16,18 185:7,8  
 185:14,17  
**certifier** 59:11 110:12  
 110:16  
**certifiers** 34:7 57:13  
 85:5 98:3 137:2,5  
 185:9,10  
**certifies** 37:5  
**certify** 37:11 52:11  
 56:16  
**certifying** 185:16  
**cetera** 72:18,20 151:6  
**CFI** 57:21  
**chain** 72:17 135:19,21  
 138:15,17  
**chair** 1:9,11,12,13 5:12  
**chairing** 5:14

**challenge** 29:19  
**challenges** 12:7 22:4  
 29:4 142:19  
**challenging** 59:16,21  
 136:2  
**change** 47:7 65:18  
 73:16 88:21 105:19  
 106:7 133:9 164:1  
 178:6  
**changed** 120:3  
**changes** 11:12,18,20  
 35:2,3 42:12 116:16  
 136:6 138:15 146:1,2  
 146:2 172:16 174:5  
**changing** 101:2,3  
**characteristic** 26:7  
**chard** 80:19  
**chat** 56:6  
**cheaper** 83:22  
**cheaply** 152:16  
**cheat** 187:6,16  
**check** 70:7 160:6  
**chemical-free** 182:13  
**chemicals** 166:4  
 176:13 182:8  
**chicken** 49:5  
**children** 20:3 177:18  
**children's** 160:22  
**chime** 70:15  
**chlorine** 15:15 16:3  
 18:9,21 19:6  
**chlorines** 15:17 20:5,6  
**choose** 118:21 120:9  
 161:13  
**choosing** 96:18  
**chopped** 149:2  
**chose** 139:12 165:21  
**circumstances** 57:17  
**cisgenesis** 32:7  
**cite** 65:6  
**cited** 90:10  
**cites** 38:10  
**citizens** 21:7  
**citrus** 103:22 108:8  
**claims** 77:1 174:1  
**clarification** 7:12  
 109:12 120:12  
**clarified** 32:13  
**clarify** 109:14 116:7  
 144:21  
**clarifying** 52:20 55:14  
 56:20 172:5  
**clarity** 28:10 50:5  
 109:16  
**classically** 181:1  
**classified** 116:2  
**classify** 116:4  
**clay** 159:4

- clean** 19:3 166:10 177:3  
**cleaner** 177:6,21  
**clear** 38:2 39:4 42:4  
 45:19,20 57:14 75:16  
 110:9 141:7 181:16  
**clearly** 45:20 46:5 48:7  
 134:12 141:10  
**clients** 113:6 176:14  
**climate** 49:4 65:18 66:2  
 73:16 105:19 106:7  
 164:1 176:3  
**climb** 181:7  
**close** 67:5 99:16 173:6  
**closed-loop** 42:19  
**closing** 3:13 13:13 47:9  
**cloth** 129:13,14  
**cloths** 149:11  
**co-evolved** 80:10  
**CO2** 66:6  
**coalition** 10:21 40:1  
 65:19,20  
**Coalitions** 171:14  
**cocoa** 127:13,13,17  
 129:3  
**coconut** 127:1  
**code** 43:12,13 102:5  
**Cody** 63:17 82:22 83:3  
 83:4  
**cold** 33:9,10 35:21 36:5  
 120:19  
**collaborate** 102:22  
**collaborations** 27:16  
**colleagues** 5:9  
**columnist** 66:19  
**combat** 136:4  
**combination** 127:13  
**combined** 137:13  
**come** 72:22 80:4 87:19  
 112:10 176:4 178:4  
 178:19 183:9  
**comes** 76:15 92:4  
 99:17 104:22 107:22  
 112:16  
**comfortable** 71:6 101:1  
**coming** 7:1 19:2,4 57:5  
 91:12 107:13 111:19  
 168:2  
**comment** 1:5 4:9 5:20  
 6:15,18 7:14 14:16  
 31:1 32:15 38:9 52:14  
 55:22 57:1 64:8,13  
 67:21 71:12 72:7 91:7  
 98:15 117:10,11  
 118:6 121:17 130:20  
 131:14,17 171:16  
 188:17 189:5  
**commenter** 7:4,13,15  
 7:22 180:4,10
- commenters** 7:6,17  
**commenting** 39:22  
 115:3 121:19  
**comments** 3:11,13 4:14  
 5:5 7:13 12:8 18:8  
 29:16,17 34:10 44:9  
 51:20 55:12 56:20  
 57:18 59:6,17 60:3  
 61:12 78:18 86:3,10  
 87:1 90:21 93:12  
 100:7 111:9,12  
 130:22 131:12,21  
 135:14 140:5,15  
 160:15 164:17,20  
 165:7 171:5 174:18  
 175:2 180:14 185:1  
 188:20  
**commercial** 23:6 79:6  
 165:13 185:13  
**commercially** 158:19  
**commit** 94:22 170:9  
**commitment** 95:1  
**commitments** 21:4  
**committed** 17:21 78:14  
**committee** 2:12 5:4  
 46:19 66:13 88:5 95:5  
**Committee's** 59:8  
**committees** 105:12  
**communicate** 182:15  
 182:17,21  
**communicated** 172:20  
**communicates** 102:21  
 166:2  
**communication** 107:14  
**communities** 44:5  
 105:6 165:14 186:21  
**community** 15:2 17:19  
 94:22 95:2 139:8  
 162:8 188:3  
**company** 140:20  
 165:12  
**comparable** 124:15  
 163:16  
**compare** 156:10 170:20  
**compared** 123:5  
**comparison** 156:1  
**compatible** 120:10  
**compete** 183:5  
**competition** 44:14  
**competitors** 100:17  
**complaint** 122:19  
**complaints** 137:14  
**complete** 122:18  
**completely** 155:15  
**complexities** 89:16  
**complexity** 51:9  
**compliance** 20:12 53:7  
 53:12 59:12 84:10
- complicate** 178:6  
**compliments** 174:11  
**complying** 142:22  
**component** 91:13  
 123:8 128:18  
**compost** 50:22 51:3  
 89:2,5,10 124:19,20  
 126:18 127:3,14,18  
 128:4,11,11,15,18  
 129:4 146:17 149:3  
 153:4,5,6,15,18 154:6  
 154:7,11,12 170:21  
 179:18  
**compostable** 55:9  
**composted** 124:12  
 147:17  
**composting** 27:11  
**comprise** 14:19  
**compromise** 90:6  
 131:4  
**computer** 63:12,13  
**concentrations** 65:1  
 80:15  
**concern** 113:10 150:8  
 152:22 162:5 163:10  
**concerned** 34:6 45:3  
 71:18 78:19 87:15  
 113:7 161:17 163:1  
**concerns** 44:9 59:10,17  
 149:9  
**conclude** 30:13  
**concludes** 43:5 188:16  
**conclusion** 90:5 96:13  
**condition** 25:4  
**conditions** 118:12  
**conduct** 77:19  
**conducted** 172:19  
**confidence** 17:12 44:18  
 95:10  
**confident** 132:16  
**confused** 114:3  
**confusion** 32:10  
**Congress** 10:22  
**congressional** 11:11  
 174:15  
**conjunction** 145:16  
**connect** 64:5  
**connection** 175:5  
**consequences** 66:15  
**conservation** 104:21  
**consider** 48:12 58:21  
 86:2 116:20 162:8  
 164:2,9 169:10  
 180:21 183:7  
**consideration** 28:22  
 33:3 60:16 105:1  
 159:18 162:19  
**considerations** 57:16
- considered** 30:3 104:7  
**considering** 70:6  
**consistently** 55:18  
 150:15  
**constructed** 42:19  
**consult** 4:20  
**consultant** 79:12  
**consume** 26:4  
**consumer** 16:6 17:12  
 20:1 40:5 44:18,22  
 45:17 46:3,22 47:4  
 71:6 77:8 96:18 161:3  
 165:22 166:20 167:20  
 168:8 173:3 175:20  
 176:11 183:22  
**consumers** 40:4,10,14  
 41:1,6 42:16 47:17  
 48:19 49:12 64:3,4  
 65:6,15 66:20 76:18  
 76:21 77:14,15,21  
 78:8 162:11,15  
 163:13 165:17 166:5  
 166:8 176:4,8 177:4  
 179:6 184:6  
**consumers'** 95:10  
**consumption** 21:21  
 163:19  
**contact** 19:13 61:17  
 87:19  
**contacted** 19:10  
**contacting** 38:20  
**contain** 80:15  
**container** 28:21 54:1  
 64:12 77:2 105:16  
 122:9,13,18,21 123:3  
 123:10,16,21 124:4,7  
 124:10,12,15,18  
 125:12 126:22 127:10  
 131:2 132:8 133:16  
 133:22 134:7 141:3  
 143:19 144:17 152:4  
 154:2 155:3,10,16  
 156:2,8,9,18 157:1,14  
 157:17 158:8,10  
 169:7 178:2  
**container-style** 50:16  
**containers** 33:18 50:17  
 55:9 67:1 123:14,19  
 124:11 128:16 132:11  
 143:4 147:18 148:14  
**containing** 67:9  
**contains** 166:17  
**contaminate** 164:12  
**contamination** 59:15  
 161:22 167:16  
**content** 22:7 67:9  
**context** 32:8  
**continual** 53:11

**continue** 24:2 85:16  
96:22 108:19 139:13  
164:21  
**continued** 84:7 108:14  
118:17  
**continues** 12:1 64:17  
67:3  
**continuing** 118:7  
**continuous** 122:4  
**contract** 85:21  
**contradicts** 82:9  
**contrast** 187:12  
**control** 16:20 17:8  
18:19 19:15,18,19  
141:7 163:7 173:22  
177:7  
**controlled** 15:19 43:2  
**convened** 1:9  
**conveniently** 102:21  
**conventional** 48:16  
68:22 69:4 70:3 72:16  
73:6,8 78:20 79:4,5  
79:22 96:2,3,11  
100:13 137:17 155:4  
155:6,7,9,16,19 156:8  
187:8  
**conventionally** 166:17  
**conversation** 187:10  
**conversations** 111:6  
144:10  
**convert** 15:5 88:16  
**converting** 34:2  
**converts** 92:4  
**convey** 139:3  
**conveyor** 19:7  
**cool** 92:7  
**copper** 12:9 16:19 17:8  
**coppers** 16:16  
**core** 127:13,13,17  
129:3  
**cores** 127:1  
**corn** 94:15 97:17,17  
99:4  
**correct** 126:8 127:12  
128:8 133:11 134:17  
153:11,12  
**corrected** 142:8  
**correctly** 97:1,16  
**corresponding** 176:21  
**Coryneum** 16:21 17:9  
**cost** 48:15  
**cost-share** 11:4  
**costly** 151:17  
**costs** 46:21 104:12  
183:11  
**cotton** 71:21  
**cough** 120:20  
**counter** 54:12

**counterpoint** 90:10  
**countries** 66:4 89:20  
**country** 17:15 41:11  
161:7  
**counts** 130:5  
**couple** 6:8 114:19  
178:20  
**course** 37:2 74:2,10  
97:9 149:13 177:14  
179:19 186:16  
**courses** 185:13  
**cover** 46:9 123:15  
150:13  
**covered** 38:21 80:7  
91:17 150:19  
**covering** 54:22 149:10  
150:4  
**crafted** 11:16  
**crazy** 90:4  
**create** 43:2 45:1 54:21  
183:7,14  
**created** 23:3  
**creates** 142:1,4,10,17  
143:3  
**creating** 32:17 84:22  
90:2 142:7 148:11  
**creation** 103:6  
**credible** 112:2  
**crisis** 99:18  
**crisp** 175:12  
**criteria** 48:12  
**critical** 12:10 52:14  
128:18 151:8 171:19  
**critically** 44:20 45:2  
**critics** 11:11  
**crop** 15:16,20 16:11,15  
55:4,6 56:19 67:2,13  
69:8 94:19 121:20  
141:4 144:3,5 146:2,2  
146:15 164:4,8  
**crops** 1:13 16:22 29:8  
41:20 44:13 46:9,9  
53:18 64:11 66:13  
95:5 108:2 116:22  
122:6,10 123:13,15  
123:17,20 127:12  
132:10 141:16,17  
144:16 147:21 163:12  
166:1,2,6 167:10  
187:13  
**crossing** 85:9  
**crunch** 13:22  
**CSA** 48:4  
**cube** 179:15,19  
**cucumbers** 122:11  
**cultivar** 159:2  
**cultivars** 140:22  
**cups** 19:8

**curing** 104:5  
**curious** 71:9 129:15  
134:1 149:16  
**current** 11:14 23:6  
29:13 57:11 70:10  
**currently** 14:21 15:9,12  
15:15 17:3 52:11  
64:20 81:15 96:2  
117:7 118:10 119:15  
137:1 168:19 174:7  
**curtail** 59:2  
**custom** 57:8  
**customers** 46:4 48:5  
92:12 182:16,21  
184:10,11  
**cutting** 18:19 72:18  
**cycle** 19:13 123:12  
124:14 128:10,12  
147:15  
**cycling** 40:18

---

## D

---

**D.C** 11:1  
**daily** 15:12 54:13  
**dairy** 56:18 85:10  
**damaged** 58:12  
**Dan** 1:21 9:20,22  
**dangerous** 11:19 66:7  
69:12 95:18  
**data** 13:9 70:6 116:13  
**Dave** 1:16 9:6,9 152:19  
154:19  
**David** 39:15 43:9,16,16  
43:20,20,22 44:3  
47:15,16 49:17,17  
**dawn** 41:3 45:8,10  
**day** 14:13 64:6 141:12  
148:7 180:11 183:18  
**daylight** 90:2  
**De** 1:15 9:1,2  
**deadline** 173:15  
**deal** 11:7 33:6  
**dealer** 94:17  
**dealing** 99:19  
**Deanwood** 131:19  
**debate** 11:10 72:13,15  
77:12  
**Debates** 160:3 165:1  
171:7,13,13  
**decide** 134:5,14 151:10  
157:19 179:6 181:21  
184:6  
**decided** 137:17  
**decides** 174:5  
**decision** 93:7,8 151:10  
151:19  
**decisions** 12:7 42:3  
143:7 181:3

**deck** 6:22 20:19 26:20  
**declarations** 143:1  
**decreasing** 158:15,16  
**dedication** 52:17  
**defer** 131:15  
**deficit** 142:7 161:8  
**define** 29:18 30:8 57:8  
105:6  
**defined** 29:21 30:12  
32:6  
**defines** 27:21  
**defining** 60:6  
**definitely** 88:10 138:19  
**degrees** 164:5  
**Dehne** 43:10,21 52:1,3  
52:7,8 56:1  
**delayed** 174:4  
**deliver** 23:7 176:8  
**demand** 21:19 41:14  
47:4,5 51:13  
**DeMinter** 43:22 52:1  
56:3,9,14,15 60:7,19  
60:22 61:14,21  
**democracy** 47:12  
**demonstrates** 23:17  
124:22  
**demonstrating** 28:14  
**deniers** 188:3  
**denies** 187:22  
**densely** 186:9  
**DEPARTMENT** 1:1  
**depend** 160:22  
**dependent** 128:22  
145:17  
**depending** 124:16  
133:5 150:5 164:9  
**depends** 25:2 146:13  
150:20 152:1 153:20  
187:2  
**depth** 46:11  
**derives** 67:7  
**described** 29:5 155:3  
**describes** 155:1  
**descriptions** 123:1  
**design** 37:9  
**designated** 33:20 36:7  
**designation** 178:5  
**designations** 179:4  
**Despite** 21:22 85:17  
**detail** 39:1 75:9 123:5  
**detailed** 59:6 123:1  
**details** 28:10  
**determine** 116:15  
**develop** 103:22 104:1  
129:22  
**developer** 124:5  
**developing** 104:3  
**development** 21:1 27:3

27:9 41:8 103:11,14  
**developments** 27:19  
**device** 6:11  
**DEVON** 2:18  
**dialogue** 13:15,17  
 82:21  
**die** 58:11 87:5 92:2  
 187:17  
**died** 88:19  
**diesel** 186:7  
**differ** 156:20  
**difference** 87:17 91:7  
 145:7 155:2 156:4,6,7  
 169:12 176:16  
**differences** 50:6 155:11  
 157:11  
**different** 15:22 16:3  
 18:16 19:9,12,14,18  
 24:21,22 25:6,7,7  
 26:12 38:19 46:11  
 57:16 71:3 89:13 93:4  
 96:14 104:10 106:6  
 107:3 130:6 131:6  
 155:15 156:11 171:2  
 178:4 179:4  
**differentiate** 169:9,11  
**differentiation** 79:2  
**differs** 71:10  
**difficult** 116:14 132:15  
 144:1,13 159:12  
 187:20  
**digestion** 29:16 30:1  
**diligence** 84:7  
**dioxide** 66:5 73:21  
**dip** 20:6  
**direct** 38:14 54:13  
**directed** 169:13  
**direction** 57:7 138:18  
 139:13 172:18 179:7  
**Directive** 137:4  
**directly** 103:20 131:18  
 149:22  
**Director** 2:11,15 4:6  
 52:9 64:2 102:18  
 131:19 160:18 171:14  
**disabilities** 177:18  
**disagreement** 105:5  
**disappointed** 32:22  
**disclose** 7:8  
**disconnect** 189:11  
**discontinued** 45:6  
**discrepancies** 110:15  
 136:22  
**discrete** 85:2  
**discussed** 23:5,11  
 57:12  
**discussing** 173:5  
**discussion** 28:20 32:14

32:18 33:2 53:22  
 121:20 128:14 135:20  
 135:22 141:5 161:19  
 168:21 169:7 178:20  
**discussions** 11:2 29:14  
 131:18 147:7 175:16  
**disease** 104:1 157:7  
**disinfect** 19:3  
**disinfectants** 15:18  
 18:17  
**disposed** 123:12  
**disqualify** 89:18  
**disruptions** 85:17  
**distinction** 32:7 50:2  
**distribute** 25:16  
**distribution** 152:12  
**ditches** 118:15 120:2  
**diverse** 131:6  
**Division** 2:11,16,17,19  
 2:21 4:6 5:9  
**docket** 14:1,2,3  
**dockets** 13:14  
**document** 28:20 32:15  
 32:19 33:2 52:21  
 53:22 88:22 89:12  
 96:22 121:21 122:19  
 127:2 139:4,6  
**documentation** 126:20  
 136:18,22  
**documents** 13:20  
**doing** 6:2 17:7 46:20  
 73:17 78:11 86:21  
 128:20 139:20  
**dokie** 61:18  
**domestic** 83:21 84:2  
 187:6  
**dominated** 183:11  
**Donald** 31:6 39:12,13  
 39:15 43:8,10,14,15  
**double** 47:1 143:3  
**doubt** 48:9  
**Dr** 26:14  
**draw** 73:10  
**drawing** 66:5  
**drawn** 49:22  
**dress** 153:20  
**drip** 152:4,10  
**driven** 161:7  
**driver** 78:8 152:2  
**drives** 65:4  
**drop** 146:22  
**drought-stricken** 43:3  
**drowning** 61:11  
**drums** 33:13  
**due** 22:3,6 23:3 59:2  
 70:14 137:14 163:22  
**dumped** 19:5  
**dust** 127:18

---

**E**


---

**e-shop** 175:13  
**earlier** 187:10  
**early** 13:20 21:15 137:7  
**earth** 149:10 176:15  
 177:7  
**ease** 145:18  
**easily** 36:4,9  
**Eastern** 1:9 189:6  
**easy** 87:16  
**eat** 65:11  
**eating** 107:18,19  
**eats** 154:12  
**ecological** 83:12 89:15  
**ecologically** 185:20  
**economic** 46:17 84:4  
 104:11 106:21 108:1  
 133:5  
**economy** 42:22  
**ecosystem** 47:22  
 176:20 177:2  
**ecosystems** 15:6 34:3  
 34:4 165:12  
**educated** 93:8  
**Edwards** 94:1 102:3  
**effect** 104:10 107:21  
 114:4  
**effectiveness** 13:11  
**effects** 12:14 83:15  
 177:19  
**efficiency** 152:3  
**efficient** 23:9 40:19  
 142:14  
**efficiently** 21:13  
**effort** 31:22  
**efforts** 33:6 34:3 59:8  
 84:2 103:7 135:17  
 137:20 139:7 171:18  
**eight** 17:16 148:4,17  
 150:16  
**either** 29:7 50:4 62:7,12  
 87:16 93:5 102:5  
 124:12 132:12 149:3  
 177:13 183:4  
**Ela** 1:15 9:4,5 76:14  
 91:2,4 126:15 127:21  
 128:13 151:3 152:22  
 153:17  
**elaborate** 106:18 127:4  
**elected** 47:9  
**electrical** 186:6  
**elevated** 122:8  
**eligibility** 42:1  
**eligible** 34:12 42:6  
 167:7  
**eliminate** 29:7  
**eliminating** 15:5  
**elimination** 21:20

**else's** 22:15  
**email** 24:12 64:5  
**embodiment** 18:3  
**embrace** 57:2  
**emerge** 32:21  
**emergency** 55:15 56:21  
 58:7,10,22 60:5,6  
 61:13 109:11 112:5  
 114:3  
**emerging** 107:9  
**Emily** 1:18 9:12,15  
 106:12,13 157:22  
 158:2  
**emissions** 72:22 73:8  
 106:8  
**emphasis** 92:14  
**emphasize** 12:17 95:4  
 122:17  
**employee** 175:14  
**employees** 175:14  
 182:12  
**employing** 138:13  
**empowering** 40:4  
**empty** 14:3  
**emulsions** 145:14  
**enacted** 136:5  
**enclosures** 67:1  
**encourage** 7:10 57:2,4  
 97:8 117:2 172:10  
 183:18  
**encourages** 117:4  
**end-of-life** 22:4 23:9  
 29:2  
**ends** 177:14  
**energy** 21:11 66:14  
 71:13 73:18 74:2,4  
 76:7 89:16 90:2  
 154:14 186:3,5,7  
**enforce** 34:7 59:16  
 110:12  
**enforceability** 59:11  
**enforceable** 57:14  
**enforcement** 11:7  
**enforcing** 55:18  
**enhance** 124:5  
**enhancing** 129:1  
**enjoy** 39:7 113:11  
**enormous** 66:16  
**enrich** 21:5  
**ensure** 19:22 84:7,9  
 85:15 105:9,12  
 138:14 174:14  
**ensuring** 135:18  
**entendre** 47:1  
**entire** 8:2 67:11 74:10  
 118:18 120:6 123:22  
 150:5  
**entirely** 132:16

**entities** 173:7  
**entrepreneur** 180:22  
**environment** 41:4  
 42:17 43:2 55:3 65:7  
 65:14 73:22 76:22  
 77:3,10 78:6 142:15  
 148:12 163:22 176:2  
 183:16  
**environmental** 25:4  
 78:12 143:8  
**environments** 21:5  
**EPO** 121:21  
**equal** 95:21  
**equally** 99:9  
**equipment** 18:18  
 133:10  
**equivalent** 97:18 98:4  
**Erin** 86:12 93:16 101:14  
 101:14  
**erosion** 73:7  
**especially** 20:4 35:7  
 65:6 76:3 98:11 141:8  
 146:15 147:21 164:11  
 167:20  
**essential** 27:19 72:15  
 74:19  
**essentially** 71:18 131:4  
 153:10 175:22  
**estimate** 126:3,9  
 132:15  
**estimated** 181:7,11  
**et** 72:18,20 151:6  
**Etka** 10:15,19,20  
**evaluates** 13:11  
**event** 58:8  
**eventually** 92:5  
**everybody** 6:6 42:9  
 62:20 82:15  
**everything's** 176:17  
**exactly** 25:14 32:3  
**example** 12:4 20:9  
 28:12,19 29:15 33:11  
 37:22 59:12 80:14  
 107:12 123:7 130:3  
 130:10 149:19 177:10  
**examples** 34:10 57:16  
 109:19 139:21  
**Excellent** 86:22 121:11  
**exception** 100:1,2  
**exceptions** 95:13  
 176:13  
**excess** 66:5 80:17  
 148:10  
**excessive** 33:17  
**excluded** 31:21 135:21  
 136:11 137:21 138:5  
 138:11,16 139:12  
 171:17 172:1 173:12

174:8  
**excludes** 141:8  
**exclusively** 33:14 97:13  
**Excuse** 147:9  
**executed** 95:20  
**Executive** 160:18  
**exempt** 33:22 36:1  
**exempting** 53:19  
**exemptions** 88:4,6  
**exist** 53:9 89:6 92:19  
 186:22  
**exists** 88:18  
**expand** 47:5  
**expanding** 11:5 46:21  
**expect** 46:6  
**expectancy** 123:10  
**expectations** 16:6,11  
 137:22 138:4  
**expected** 181:14  
**expensive** 145:13  
**experience** 58:10 99:10  
 100:9 170:17 184:9  
**experienced** 44:21  
**expert** 50:4,21 180:22  
**expiration** 38:6  
**explain** 32:3 123:10  
**explained** 90:17  
**explaining** 26:11  
**explore** 112:12  
**explored** 112:1  
**exponentially** 181:14  
**expose** 68:10  
**expressed** 29:17  
**extends** 136:1  
**extent** 13:10  
**extra** 75:1 147:4 152:8  
**extract** 23:2  
**extremely** 20:5 22:9  
 98:22 171:18

---

**F**

---

**face** 84:20  
**face-to-face** 4:16,22  
**facilitating** 189:2  
**facilities** 33:9 96:5  
 167:6  
**facility** 19:2 36:12 51:4  
**fact** 54:7 66:13 79:5  
 88:19 161:16 163:21  
 185:19  
**factor** 58:4 92:18  
**factors** 35:22  
**facts** 89:12  
**faint** 113:21  
**fair** 53:8 156:1  
**fairly** 36:8 105:14 189:3  
**faith** 84:15  
**fall** 5:20 50:7 59:7

**fallow** 41:19  
**false** 153:16  
**families** 20:2 32:8  
**family** 85:22 182:11  
**far** 49:13 50:13 54:4,18  
 55:4,14 66:3 148:21  
**farm** 17:2,3 30:9 31:17  
 35:8 37:4 55:11 67:9  
 83:12 85:11,18 86:1  
 89:18 95:19 96:15,16  
 104:13 106:22 107:10  
 118:3 121:14 124:6  
 167:17 169:19 172:16  
 173:16 174:11 182:11  
 185:3,6 186:20  
**farmed** 158:19  
**farmer** 11:5 33:15 37:14  
 44:3 47:10 53:8 59:14  
 86:20 99:3,11 101:2  
 143:6 159:10 166:7  
 173:3 180:16  
**farmer's** 104:17 162:3  
 187:3  
**farmers** 12:10 21:18  
 22:2 23:8 29:8 33:8  
 33:19,21 35:20 36:19  
 47:5 48:5 52:9,12  
 83:15 85:4,8 88:14  
 89:1,4 94:19 96:17  
 98:2,11 100:9,20  
 105:8 107:6 108:2  
 118:8 175:15 176:3  
 179:4 182:5 183:21  
 184:3 185:5 186:14  
 187:16  
**farming** 27:22 28:14  
 29:1,5 30:4 39:7  
 47:11 67:6 105:18  
 118:21 141:7 177:11  
 182:6 187:1  
**farms** 84:18 85:1 95:17  
 96:10 97:14 107:4,17  
 107:18 122:2 182:3,7  
 182:11,22 183:3,9,11  
**Farris** 121:8 135:4  
 140:6,12,16,17  
 143:22 144:12 145:12  
 145:22 146:10 147:19  
 149:21 151:13 153:12  
 153:19 155:5,13  
 156:19,21 158:13  
 159:22  
**Faso** 173:2  
**favor** 32:16 64:10 83:22  
**fears** 188:6  
**feasible** 150:10  
**features** 28:4  
**Federal** 5:3

**fee** 57:22  
**feed** 56:22 59:5,9  
 181:10  
**feedback** 13:20 63:2,3  
 63:14 131:11  
**feeding** 12:20 125:13  
 125:16,22 126:7  
 128:2,15 133:19  
 134:3 141:14 143:21  
 144:18 145:20 151:6  
 151:6 153:7,9 179:12  
**feeds** 11:6  
**feedstock** 29:20  
**feedstocks** 29:11,18  
 30:2,7  
**feel** 32:2 53:3,14 54:14  
 54:20 55:1,16 60:4,18  
 61:16 110:8 132:5  
 135:20 159:15,16  
 167:4 168:8,10  
**feeling** 83:15  
**fees** 22:9  
**feet** 28:7,11,12  
**fertility** 89:1 141:9  
 142:13 144:5,19  
 145:1,17 151:16  
 153:10 155:14  
**fertilize** 26:9  
**fertilizer** 69:10,16 81:8  
 148:8,12 152:6  
**fertilizers** 26:6,8,12  
 40:17 89:4 145:4  
 146:14 148:7 167:13  
 169:22 170:1  
**field** 7:20 18:17 22:18  
 23:2 28:20 54:1 57:4  
 84:9 90:7 94:15 99:2  
 99:8,8,9 118:16,19  
 120:7 149:5 162:22  
**fields** 22:13 41:18 55:1  
 85:10 107:19 120:4  
 157:17,17 186:22  
 187:9  
**figure** 61:6 115:2,9  
 168:7  
**Filipowich** 26:21 31:5  
 39:12,18,21,22  
**fill** 103:1  
**fillers** 22:8  
**film** 21:16 22:2,5,7,12  
 22:18,19 23:2,8,13,15  
 23:16 25:3,8 27:8  
 29:4,12 30:15  
**films** 23:6,12 24:2,6  
 29:6,8 30:11 149:14  
**filter** 163:7  
**final** 29:21 57:5 64:19  
 96:1

**finally** 17:10 29:9 42:22  
105:15 117:4 188:8  
**financial** 42:14  
**find** 5:17 7:2 40:4,12  
45:22 170:15  
**finding** 12:13 31:4 62:6  
98:13  
**fine** 117:22 159:3  
**finer** 90:3  
**finish** 7:18  
**finishes** 7:13  
**fire** 16:21 17:9 18:19  
112:14  
**firm** 37:7  
**first** 10:15 31:21 36:17  
40:15 68:1 83:14  
95:13 103:3 110:5  
115:21 122:17 147:19  
151:13 153:14 185:6  
**fish** 50:11 87:17,18  
88:16,19 89:9 92:2  
145:14 187:17,20  
**fit** 127:8  
**fits** 74:12  
**five** 86:21 88:2 126:3,5  
126:6 181:13,15  
186:1,18  
**fixated** 175:18  
**flavor** 96:18  
**flesh** 77:11  
**flexibility** 57:15 60:8  
**flip-side** 58:20  
**flood** 42:7  
**focus** 11:3 13:4 21:1  
93:2 94:15 137:19  
138:6  
**focusing** 122:14 139:11  
**folks** 55:12 111:18  
114:19  
**follow** 61:7 68:20 69:18  
79:17 112:19,22  
126:6 127:5 146:6  
151:3 156:13 167:9  
170:2  
**followed** 14:8 20:18  
26:20 31:2,5 39:12  
43:9,21 52:1 56:3  
62:2,2 86:11 93:16  
108:21 115:11 140:7  
147:6 160:2 164:22  
171:7  
**following** 5:18 10:16  
47:11 102:13 110:1  
121:7 126:16 162:8  
185:21  
**food** 16:7,9 19:20 20:12  
26:4 36:15 49:2 59:13  
65:11,12 66:2,19

68:13 73:1,3 74:4,10  
77:21 78:5,10 80:20  
83:12 87:15 88:1  
120:8 161:6,8,11,13  
161:21 162:6 163:3  
163:18 164:9,11,12  
166:11,16,17 181:12  
183:8 186:22  
**foods** 19:10 64:21 65:5  
166:21  
**footprint** 66:15 71:20  
72:8 74:9,15 75:4  
**Foran** 140:7 160:2  
164:22 165:3,8,11  
168:17 169:11 170:12  
**force** 32:17,19 33:1  
34:22 181:6  
**forced** 147:12 183:3  
**forgiveness** 6:5  
**forgotten** 175:20  
**form** 69:10 85:13  
151:22,22 154:8  
187:20  
**formalities** 6:14  
**formed** 65:18  
**former** 31:15  
**forms** 16:3 122:22  
155:13,14  
**formulations** 12:14  
**forth** 50:11 103:8 141:6  
143:2  
**forward** 5:4 32:1,18  
86:4 139:16 140:15  
141:4 172:10  
**fossil** 89:19  
**found** 65:9 68:15  
107:15 163:4 170:19  
**four** 31:20 65:22 186:12  
**Fourth** 116:21  
**fragments** 23:3  
**frame** 166:7  
**Framework** 103:7  
**Francis** 1:13 10:3,4,8  
10:11 125:6,10  
126:13 127:22 133:13  
143:16 151:1 152:18  
152:21 178:12,15  
179:9  
**Francis's** 126:16  
**frankly** 45:3  
**fraud** 171:19 172:8,17  
**fraudulent** 11:7 83:22  
**fraudulently** 137:16  
**free** 61:16 161:6 162:4  
**fresh** 64:13 67:14  
**friendly** 44:5 185:3  
**front** 6:6  
**fruit** 18:15 146:20

159:11  
**Fruitilicious** 31:16  
**fuels** 89:19  
**full** 10:21 11:16 53:7,11  
59:12 78:21  
**fully** 15:14 49:20 78:7  
139:6  
**functional** 80:11  
**fundamentally** 45:12  
**funding** 10:21 11:3 12:5  
**fungus** 92:20  
**furrows** 150:2  
**further** 4:21 7:11 38:10  
57:8,12 78:3 95:8  
109:16 110:14 138:15  
141:5 142:20 162:11  
**fusion** 32:8  
**future** 27:17,20 28:18  
29:14 37:20 38:3  
45:14 88:6 142:9  
163:22 174:6

---

**G**


---

**gain** 42:13  
**gap** 96:11  
**gaps** 103:2 138:9  
**gas** 72:22 73:20 84:18  
84:22 106:8  
**gases** 106:1  
**gatekeeper** 28:2  
**gather** 64:17  
**GE** 13:7  
**general** 44:12 50:8 57:7  
75:10 84:12 96:17  
113:11  
**generally** 63:14 112:4  
145:20 171:20  
**generation** 85:22  
**genetically** 167:14  
**geology** 50:20  
**getting** 50:22 63:1,3  
78:9 89:4 105:4 111:5  
114:21 120:19 167:16  
168:9  
**give** 7:7 20:2 25:4 34:10  
35:11 50:5 63:7 75:1  
86:17 126:2 146:8  
154:22 172:16 176:14  
177:9  
**given** 6:2  
**giving** 184:10  
**glad** 25:9 67:2  
**global** 28:15 65:22 66:3  
72:19,21,22 73:3  
**globally** 17:15  
**glyphosate** 163:1,4  
**GMO** 167:14  
**GMO-free** 161:6

**GMOs** 76:18 166:18  
**goal** 16:8 27:16 173:10  
**goals** 84:4 109:20  
**governmental** 103:1  
**Governor** 44:4,17  
**grab** 152:8,9  
**grain** 83:18,19 96:17  
136:16  
**grains** 176:16  
**grams** 24:20  
**grateful** 160:21  
**gratification** 47:7  
**gravel** 186:19  
**grazing** 49:10 85:10  
**greater** 22:20 47:22  
**green** 149:3,4 153:21  
**greenhouse** 28:20 54:1  
72:22 106:1,8 124:9  
130:10 187:13  
**greenhouses** 67:1 80:3  
80:4 82:1  
**greening** 104:1 108:8  
**greens** 65:1 68:11,13  
68:16  
**grocery** 40:6  
**ground** 53:18 150:14  
150:17 158:8,11,18  
158:20 159:1,3,8  
167:10  
**group** 15:1 175:15  
**groups** 17:20  
**grow** 17:11 40:16 44:13  
51:6 88:9,10 92:15,20  
92:21,21 122:10  
124:11 159:7 181:14  
183:19 186:9  
**grower** 109:8 146:4,13  
159:13 175:12  
**growers** 41:14,17,21  
42:11 59:13 117:6  
125:12,15 141:8  
142:11,21 147:4  
176:15 178:3 187:10  
**growing** 12:3 22:19  
41:19 42:8 50:21  
64:12 66:16 68:3  
73:18 81:7 82:6 93:1  
96:15 123:8,11,12  
124:14 128:5,12  
133:22 141:3 159:6  
165:13 169:7,8 176:7  
177:15,22 178:2  
179:5,11,22 181:10  
184:5 185:21 186:2,4  
186:11 187:2  
**grown** 41:2,2 46:2,2,6  
50:16 53:18 68:16  
72:2 77:2 90:7 131:2

131:3,3 133:16,16,17  
133:20 134:7,7  
161:11,13 162:13,22  
163:18,20 166:1,2,17  
166:21 167:4,10  
177:6 178:5 179:6  
181:12 182:14 184:8  
**grows** 187:19  
**growth** 23:20 57:2  
123:18 141:16  
**Guernina** 26:21 31:2,2  
39:9,10  
**guess** 43:13 46:5 75:4  
76:14 127:21 128:14  
**guidance** 38:12 52:19  
52:20 56:22 57:14  
59:5,9 60:5,7,11,15  
60:18 61:2,4,8 84:6  
85:6 104:21 110:14  
117:1 171:17 172:4  
172:13  
**guide** 103:14  
**guidebook** 98:2  
**guidelines** 167:9

---

**H**


---

**habitat** 54:21 124:6  
**half** 85:12 122:1 179:15  
179:16  
**Hamza** 26:21 31:2  
39:10  
**hand** 90:11  
**hand-held** 6:11  
**handful** 125:19 152:9,9  
**handing** 15:11 184:9  
**handle** 37:6,15  
**handler** 33:4 35:19 37:7  
37:20,21  
**handlers** 16:12 33:7  
**handling** 15:9,16,20  
37:18  
**handy** 6:10  
**Hanna** 14:9 20:18 26:20  
27:2,3  
**happen** 49:5 69:14 70:1  
84:13 88:15 113:5  
148:15  
**happened** 69:6 75:19  
117:19 143:13  
**happening** 100:13  
139:8 157:3 162:17  
**happens** 69:9 147:16  
147:18  
**happy** 108:13 130:2  
186:16 188:15  
**hard** 6:7 52:17 88:9  
95:1 101:4  
**hard-core** 65:6

**harder** 118:22 120:9  
157:8  
**harm** 23:19  
**harmful** 166:4  
**Harold** 10:16 14:7,9,14  
18:5,6,7 20:15  
**Harriet** 1:14 8:11,14  
25:20,22 34:17 47:15  
60:20,22 97:5 98:19  
129:8  
**Harvesting** 135:11  
**Haspel** 66:18  
**Hawaii** 185:4  
**hazard** 46:5  
**head** 17:17 40:7  
**heads-up** 7:1  
**headset** 160:12  
**health** 12:15,22 21:8  
28:15 46:10 48:10  
49:3 54:15 64:20 65:4  
74:19 78:8 88:22 89:9  
105:2,3,7 124:8  
141:22 143:7 177:19  
**healthier** 45:14 46:8  
48:10 65:12 78:4  
176:2 177:6,22  
**healthy** 27:22 54:17  
65:7 167:3 177:3  
182:13  
**hear** 7:15,18 10:5 18:12  
31:12,13 39:18 43:18  
52:3 56:10 62:20 83:7  
94:6 106:14 114:14  
114:16 115:6 117:21  
119:11 125:7,9  
126:21 134:11 135:6  
144:10 146:7 160:8,9  
165:4,9 169:2 180:7  
184:20 188:2  
**heard** 53:14 68:7 77:1  
79:22 98:10 103:15  
113:15 168:20 169:6  
170:6 177:16 187:9  
**hearing** 5:4 86:9 101:11  
108:18 114:7,17,22  
140:4 160:5 175:1  
**heat** 154:6  
**heavily** 140:21  
**heavy** 92:14 150:6  
159:4 177:17  
**held** 55:5 96:7,8  
**hello** 8:19 9:3,22 47:16  
52:7 97:6 115:5,17  
**help** 5:10 27:11 55:17  
65:13 76:22 77:3,10  
78:6 98:2,8 138:14,18  
165:22 181:10,21  
**helped** 17:11

**helpful** 25:5  
**helps** 166:19  
**herbicide** 118:22  
119:14,16  
**herbicides** 21:20  
118:11,14 119:12  
120:9 166:11 168:11  
**herbs** 53:19 88:10  
**Hey** 8:17 9:20 100:6  
178:18  
**hi** 8:14 9:6,9,15 10:3  
18:7 25:21,22 26:1  
34:18,19 35:16,17  
39:21 60:2,21,22 64:1  
67:20 78:17 102:17  
110:20 111:3 114:1  
117:18 118:2 129:9  
130:17 168:20 171:13  
**high** 22:6,9,10 51:15  
65:1 80:15 88:13 99:8  
146:11 148:11 151:18  
153:6 159:4 177:12  
179:20  
**high-** 28:9  
**high-level** 28:21  
**higher** 68:2 166:16  
**highest** 69:4  
**highlight** 105:17  
**highly** 128:21  
**hold** 6:12,12 34:12 35:4  
43:19 56:7 67:11 69:2  
106:13  
**holding** 170:13  
**holistic** 28:6 49:13  
51:15  
**Hollandia** 175:11  
**honest** 20:13  
**Honeycutt** 135:4 140:7  
160:2,8,11,16,17  
**hooked** 20:19  
**hope** 13:16 66:5 96:22  
159:16  
**hopeful** 58:3  
**hopefully** 10:12 115:2  
**hoping** 97:21  
**horticultural** 17:5  
**hour** 40:6  
**Howard** 86:12 93:15  
94:6,10,11 98:15,19  
**huge** 155:6 156:9 162:1  
162:12  
**humanity's** 66:4  
**hundreds** 185:12  
**hurdles** 118:12  
**hydro** 167:4 169:7  
**hydro-organic** 161:15  
163:18  
**hydro-organics** 164:14

**hydrogen** 18:22  
**hydrolyzed** 145:10  
**hydroponic** 40:1 41:21  
42:7,18 43:1,5 44:10  
49:21 53:15 61:11  
64:11,22 68:2,11  
69:15 70:3,7 71:7  
72:1 73:21 77:2,17  
79:3,4,12 91:18 117:6  
125:15,19 126:7  
134:3 163:12,15  
167:1,6 168:13  
169:10,12,19 170:16  
170:19 175:12 178:21  
**hydroponically** 45:10  
68:15 131:3 133:20  
134:7 163:17  
**hydroponics** 40:13,16  
41:5 42:5 44:14 45:4  
48:11,15 49:18 50:10  
53:13 69:4 78:20,21  
79:1,19,22 81:12,21  
82:8 91:21 92:9  
105:16 133:16,21  
141:3 161:3,10  
162:10,13,20 163:6  
165:15 168:21 170:7  
178:1 180:20 181:9  
181:12,17

---

**I**


---

**idea** 57:17 60:12,14  
154:22 157:5  
**ideals** 27:21  
**ideas** 32:18 61:15  
**identical** 156:19  
**identified** 116:19  
**identifies** 105:17  
**identify** 27:12 136:21  
**identifying** 13:6 172:11  
**ignore** 92:15  
**ignored** 161:22  
**illustrates** 186:17  
**imaging** 34:8  
**immediate** 47:6  
**immediately** 58:4  
**immersed** 19:5  
**impact** 28:14 54:5 55:2  
76:5 84:17 85:14  
106:5  
**impacted** 85:4 124:2  
**impacting** 163:2  
**impacts** 84:22 89:14  
106:21 143:8  
**imperative** 172:2  
**implement** 17:4 54:21  
**implementation** 16:9  
19:20 139:20

**implemented** 27:14  
 136:5,9,14 137:7  
**implementing** 104:12  
 107:6  
**implicated** 79:7  
**implication** 72:4,11  
**imply** 79:18  
**import** 79:10 164:10  
**importance** 12:17  
 16:16  
**important** 15:11 16:5  
 18:10 20:5 28:1 30:7  
 30:7 42:2 44:20 45:2  
 45:16 54:15,16 67:12  
 71:16 75:9 76:19 86:4  
 87:3,13 92:18 98:22  
 105:21 116:19 147:21  
 165:10 172:4 173:20  
**importantly** 6:8 85:20  
**imported** 83:19 136:9  
 136:13 174:1  
**importers** 173:8 187:5  
**importing** 71:21 136:15  
**imports** 11:8 83:14,16  
 84:1 136:2 139:10,18  
**impose** 89:21  
**imposes** 173:14  
**impossible** 145:22  
 187:15  
**impractical** 59:13  
**impracticality** 59:11  
**improve** 89:8  
**improvement** 53:11  
**improvements** 48:21  
 84:13  
**improving** 67:8 173:21  
**impurity** 32:14,17  
**in-ground** 49:20 123:6  
 124:16 156:16  
**inadequate** 58:2,22  
 59:3  
**incentive** 15:5 183:12  
 183:14  
**inch** 179:15,16  
**include** 13:19 53:6  
 103:21 104:8 109:21  
 122:22 124:20  
**included** 67:15  
**includes** 17:14 28:22  
 46:11 123:4  
**including** 23:2,22 53:10  
 56:18 106:7 122:2  
 149:15  
**inclusion** 103:10 104:8  
 105:2  
**inclusively** 12:1  
**income** 84:15  
**incoming** 30:2

**incorporated** 124:13  
 140:18 185:4  
**incorporating** 162:9  
**increase** 65:21 66:1  
 84:2 107:4,16 154:2  
 172:21  
**increased** 6:1 21:18  
 107:7 137:19 142:17  
 152:3  
**increasing** 21:19  
 104:16 105:19 107:17  
 107:22 117:2 141:22  
 163:22 183:20  
**incredible** 85:17  
**indecision** 41:22  
**India** 71:22  
**indicate** 48:4  
**indicated** 50:2  
**individual** 44:15 48:10  
**indoor** 66:15,17 73:22  
 75:18 124:7  
**indoors** 73:18  
**industries** 27:11  
**industry** 21:10 23:18  
 57:3 84:3,18,22 85:4  
 95:9 97:1 101:5  
 181:12,17,18,22  
 182:6,7 183:1,10,13  
**infertile** 186:13  
**inflate** 142:11  
**influencer** 28:2  
**information** 4:22 34:11  
 104:14 111:16 138:3  
 138:10 151:9  
**informed** 103:19  
**ingredients** 137:21  
 166:3  
**inherent** 129:2  
**inherently** 185:15  
**initial** 7:14 128:6  
**initiative** 66:1  
**input** 23:17 27:6 30:4,9  
 32:16 76:7 79:13  
 81:18 157:16  
**inputs** 47:18 48:7 49:14  
 71:14 73:19 142:8  
 148:19 156:16 162:20  
 163:17 167:5 176:5  
 176:12 177:1,7,9  
**inside** 123:14 124:22  
 186:21 187:13  
**insight** 131:11  
**insights** 135:17  
**inspected** 96:6  
**inspection** 36:10  
**inspections** 142:21  
**inspector** 36:4,11 84:12  
 97:8

**inspectors** 112:19  
 124:8 129:10 138:6  
**inspire** 136:7  
**instance** 37:3 88:7  
 89:12 109:18  
**instigators** 31:22  
**institutions** 103:1  
**instructed** 138:6  
**insufficient** 110:3  
**insure** 11:16 16:5 27:13  
 27:22 28:8,16  
**integrated** 104:1  
**integrity** 12:17 13:4  
 17:13 47:3 84:3 95:9  
 96:9 135:18 138:14  
 187:3  
**intended** 51:16  
**intensive** 74:4 76:7  
**intent** 57:10  
**intention** 58:6  
**intentions** 95:14  
**interact** 13:17 118:9  
**interaction** 91:13,17  
**interactions** 46:12  
**interest** 47:6 105:13  
 167:20  
**interesting** 71:15  
**interference** 62:19  
 63:10 104:15,18  
**intermix** 20:7  
**international** 65:19,21  
 172:22  
**interrupt** 90:17 144:7,7  
**intersection** 173:20  
**introduced** 173:2  
**introduction** 28:2  
**introductory** 6:14  
**intuitive** 74:18  
**intuitively** 74:14  
**invest** 133:10  
**investigating** 12:20  
**investigation** 137:1  
**investors** 41:14  
**involved** 38:18 131:9  
 131:18 140:21 169:20  
**Iowa** 94:14  
**irrespective** 125:1  
**irrigation** 163:5  
**issue** 29:11 71:15 84:1  
 84:6 86:4 88:1 139:8  
 157:8 161:22 162:17  
 165:10 171:19 173:16  
 174:7,12 182:3 187:7  
**issued** 137:4  
**issues** 6:7 13:20 23:9  
 44:10 46:10 52:14  
 54:3 71:1 77:17,22  
 80:7 83:13 103:16

131:4 136:4 137:15  
 138:18  
**issuing** 137:2

---

**J**


---

**J-O-S-Z-H-E** 62:3,14  
**Jackie** 43:21 52:1 56:2  
 56:6,6,7,12,15 59:22  
 60:1,2,21  
**Jacksonville** 64:18  
 117:8  
**James** 83:2 85:8,13  
 86:11,14,16,19 87:1  
 90:16,20 93:9  
**Jeanette** 14:9 20:18  
 26:19,22 27:2 30:17  
 31:1  
**Jesse** 1:12 8:17,19  
**job** 55:16 189:9  
**jobs** 43:2  
**Joel** 56:3 62:2,9,9,10,11  
 62:13 171:10 175:7  
 180:5,5,10,12,15  
 184:13,14  
**Joelle** 1:17 9:9,12  
**John** 173:2  
**joined** 144:9  
**Joszhe** 62:3,14  
**judge** 87:14  
**juice** 37:17  
**July** 136:14  
**jump** 157:3  
**justice** 46:17  
**justify** 53:1

---

**K**


---

**keep** 6:9 30:14 35:7  
 36:7 85:19,19,20  
 107:8 124:1 129:4  
 153:22 177:20 178:14  
 179:3  
**keeping** 22:9 129:22  
 136:11 137:22 138:4  
 138:11 161:19,20  
 189:10  
**Kelly** 56:4 62:2,9,9  
 171:10 175:7 180:5,7  
 180:15,16  
**Kelsey** 102:13 108:21  
 109:2,4,7 111:8 114:8  
**kept** 49:18 90:18  
**key** 13:20 47:2 79:2  
**Kieran** 140:7,8 160:2  
 164:22 165:2,11  
 171:5  
**kill** 80:21  
**Kiroff** 63:17 82:22  
**kit** 113:12

**knowledge** 103:2  
**known** 21:17 50:17  
 58:1 177:18

---

**L**

---

**label** 17:13 36:19 37:2  
 37:10 40:3,11 41:7  
 45:1 90:6 133:20  
 162:6 163:18 164:14  
 184:3,4  
**labeled** 53:16 168:4  
**labeling** 38:3,6 44:19  
 45:4 131:2 157:13  
 178:19  
**labels** 37:3  
**labor** 42:15 142:17,18  
 146:19 150:7 151:14  
 151:17,18 152:3  
**lack** 138:12  
**laid** 110:4  
**land** 34:12 129:16  
 158:15,16 186:10,13  
**land-** 22:7  
**lands** 48:17  
**landscape** 129:13  
**language** 33:18 53:3,6  
 53:10 57:13,18 59:18  
 60:16 109:17,18  
 110:12 173:14 174:10  
**large** 41:12 79:5 96:11  
 113:9 141:20 183:8  
**larger** 113:11  
**largest** 64:4 100:17  
 142:19  
**lastly** 189:1  
**lately** 105:4  
**law** 34:13 74:14  
**laws** 41:13  
**lead** 167:3 177:17  
**leader** 28:17  
**leading** 47:6  
**leads** 71:17 72:3  
**leaf** 80:17  
**leaked** 147:20  
**leaking** 153:1  
**leaks** 142:6  
**lean** 51:9 179:7  
**learn** 64:22 78:12  
**learning** 78:9 177:18  
**leaves** 149:1  
**leaving** 41:18  
**led** 167:19  
**left** 102:7 150:2  
**legal** 16:11 19:21 34:14  
 188:2  
**legislation** 173:5,10  
**legislative** 171:14  
 172:15 173:18 174:10

**lengthier** 123:4  
**let's** 74:22 83:8  
**letting** 188:5  
**lettuce** 40:7 66:17 68:2  
 71:14 73:17 75:17,18  
 75:19,20 76:9 123:14  
 175:12 179:10  
**lettuces** 81:13  
**level** 28:10 75:9,10 84:9  
 113:13 168:2  
**levels** 66:6 68:16 69:5  
 69:12 70:8 81:5 107:8  
 163:13,15 177:12  
**Lewis** 2:11 3:3 4:3,5  
**liberty** 28:5  
**lieu** 54:9  
**Lieutenant** 44:4,17  
**life** 18:4,4 87:10,17  
 89:16 123:10  
**light** 54:4,9,12,14 74:3  
 79:20 80:3 81:21,22  
**lighting** 54:7  
**liked** 55:11  
**Lillie** 52:2 56:3,4 62:1,4  
 62:6,8  
**Lima** 1:15 9:1,2  
**limbs** 18:19  
**limit** 68:12,17 89:21  
 143:8 171:22 173:12  
**limited** 141:16  
**limiting** 81:7 175:21  
**limits** 143:5  
**line** 49:22 62:4,16 93:17  
 94:18 102:5 114:11  
 114:16 115:3 144:20  
 180:6 184:18,19  
 189:12  
**lines** 13:4 19:4 84:11  
 124:2  
**linked** 65:2 80:20  
**Lipstreu** 63:17 83:1,7  
 83:11,11  
**liquid** 69:10,15 81:7  
 125:13,15,20,22  
 126:7 128:2,14  
 133:19 134:2 141:14  
 143:20 144:18,19  
 145:1,2,4,8,9,14,20  
 151:5,22 153:7,9  
 154:9 179:12  
**Lisa** 1:15 2:14 9:1  
**list** 2:14 6:19 7:3 12:3  
 12:16 16:17 17:1  
 30:15 43:12 53:2 56:4  
 62:10 82:20 83:4  
 93:12 103:12 108:19  
 116:8 118:10 119:16  
**listed** 49:21 89:3

112:17 157:16  
**listen** 27:5 35:9 44:8  
**listening** 160:19  
**listing** 118:17  
**little** 7:1 18:8,12 32:3  
 48:1 49:19 50:5 61:11  
 75:5 77:9,11 78:18  
 90:4 106:19 111:12  
 113:21 114:3 119:12  
 123:17 127:4 133:20  
 144:22 147:11 150:13  
 152:5,9 154:1 156:22  
 157:2,4 158:20 166:6  
 179:17 186:1,4  
**live** 93:1  
**lives** 160:22  
**livestock** 12:16 54:13  
 56:18 58:13 80:21  
 109:8 136:10 137:6,9  
 137:17  
**living** 176:21  
**lo** 99:7  
**loads** 137:12  
**local** 165:14  
**located** 57:21,22  
**location** 57:11 61:16  
 144:16  
**locations** 141:17 150:4  
 150:11  
**logical** 88:11  
**logo** 161:14  
**long** 83:16 137:12  
 170:12 188:2  
**long-term** 28:8 49:2  
**longer** 34:15 83:19  
**look** 24:14 29:9 38:10  
 40:12 61:13 71:8 75:9  
 81:2 139:10,17  
 147:11 181:22  
**looked** 68:9 112:7  
 157:15  
**looking** 5:4 61:8 76:2  
 96:9 110:12 113:5  
 130:21 165:19  
**loopholes** 173:6  
**loosely** 51:11  
**loosen** 51:13  
**lose** 85:22 182:22  
**losing** 108:2  
**loss** 23:3 73:7 85:7  
**lost** 84:15 164:4,7  
 175:4  
**lot** 17:4 18:20 32:10  
 33:8 34:12 47:17 79:6  
 79:20 105:4 110:13  
 132:7 138:10 146:14  
 153:9 158:18 159:9  
 167:22 169:6,20

170:6,7  
**lots** 107:2,4 128:14  
 149:14 179:3  
**loud** 120:20  
**love** 70:5 92:12,12  
 184:11  
**lovely** 6:12  
**low** 79:14 94:19 99:7  
 146:11 183:11  
**lower** 23:13 48:15  
 183:1  
**lowest** 183:14  
**Luke** 86:12 93:15 94:4  
 94:4,8,11 97:3,4,6  
 98:18 100:3,6 101:8,9  
**lump** 133:21  
**Lusk** 31:6 39:12 43:8  
 43:10

---

**M**

---

**Maben** 102:13 108:21  
 109:3,6,7 111:15  
 112:3,11 113:9,18  
**main** 31:22 119:5  
 169:12  
**maintain** 95:10  
**maintaining** 16:16 67:7  
**major** 99:18  
**majority** 80:1 124:17  
**makeup** 177:13  
**making** 11:20 24:16  
 46:8 95:13 135:17  
 151:10,19 154:16  
**managed** 149:18 167:1  
 169:18 170:14  
**management** 12:20  
 19:15 21:21 51:7 57:9  
 58:5,17,22 59:3  
 103:11 104:2 109:20  
 122:14 141:9 142:15  
 167:2  
**Manager** 2:14 56:16  
 140:17  
**managing** 19:14 21:12  
 21:14  
**mandating** 173:7  
**mandatory** 105:11  
**manipulate** 157:2  
**Mann** 171:11 175:7  
 184:18 185:2,2  
 188:15  
**manner** 23:10 174:15  
**manpower** 146:14  
**map** 61:4  
**maple** 44:21  
**maps** 34:8  
**marginal** 186:13  
**marine** 116:11

**mark** 7:16 179:5  
**market** 27:3,9 42:3 48:5  
 162:3 168:2 181:1,18  
 182:4,18  
**marketplace** 99:20  
 100:18 159:11  
**married** 58:1 99:5  
**mass** 24:15  
**massive** 161:8 181:22  
**match** 40:4  
**material** 13:7 16:1,20  
 17:1 19:11 22:8 103:4  
 112:20 116:13,17  
 147:16 148:22 154:7  
**materials** 2:18 15:9,11  
 15:15,21 16:4,14 17:6  
 18:9,16 19:12,17 20:8  
 23:17 24:21 25:7  
 28:17 29:2 103:12  
 109:19 112:6 116:8  
 116:11 118:17 124:20  
**mats** 149:22 150:4  
**MATT** 2:17  
**matter** 6:12 67:8 76:8  
 87:6 154:10 174:13  
 189:13  
**matters** 7:9 50:20  
**McELROY** 2:20  
**McEvoy** 17:16  
**McQuaig** 86:12 93:16  
 101:14  
**meal** 145:10  
**mean** 37:1 39:3 45:16  
 47:1 69:1 71:1,14  
 72:4 75:14 77:13 78:7  
 82:3 91:11 119:17  
 128:1,17 145:3  
 146:10 151:4,8  
 152:13 155:5,13  
 156:3,7,9 157:15  
 158:13  
**meaning** 161:15  
**meaningfully** 106:5  
 110:16  
**means** 40:5 45:15 46:2  
 49:6 145:1 176:5  
**measure** 105:7  
**measured** 95:20  
**measures** 15:19 58:8  
 58:18 177:22  
**measuring** 95:18  
**meat** 104:5  
**mechanical** 23:4  
**mechanism** 87:8  
**media** 64:6 125:20  
 128:10  
**medication** 57:22  
**medium** 51:2 79:7,8

81:7 143:19  
**meet** 21:18 23:12 40:13  
 41:15 47:5 48:11  
 51:13 84:4 132:9,17  
**meeting** 4:16,18,22 5:1  
 5:15,20,21 8:3 13:22  
 15:10 16:10 20:11  
 38:11 82:14 131:20  
 172:9 189:2  
**meetings** 5:1 6:1  
**Megan** 160:2 164:22  
 171:7,12,13 174:21  
 175:1  
**Megha** 108:22 115:10  
 121:6,7,9,13 125:4  
 135:2  
**Mekkaoui** 93:21 101:21  
**member** 3:8 4:10 10:22  
 14:14 31:16  
**members** 1:10 4:8  
 52:16 64:22 82:17  
 94:21 111:22 116:10  
 116:11,15 117:4  
 118:9,10 119:16  
 181:20 188:19,21  
**membership** 71:10  
**memo** 24:8 29:12 30:16  
 32:9  
**mention** 33:1 119:3  
**mentioned** 18:10 22:22  
 45:8 81:1 108:7 129:9  
 188:14  
**merely** 96:19  
**merits** 30:5 109:22  
**mesh** 41:5  
**message** 7:4 31:3,21  
 39:14 48:22 93:17  
 102:8 114:21 115:12  
 140:9 171:9  
**met** 16:6 26:15  
**metal** 177:17  
**meter** 24:13,20  
**method** 29:1 67:6 92:15  
 95:18 105:18 142:20  
 154:11 184:5  
**methods** 13:6,11 50:3  
 58:16 59:15 67:10  
 96:20 116:1 182:8  
 183:12,21  
**Michelle** 2:12 3:9 4:3  
 8:5 25:13 101:17  
 111:4,11 144:8 169:1  
 188:14  
**microbes** 26:3,9 46:11  
 51:9  
**microbial** 145:5 148:6  
 154:3 157:4 170:20  
 170:22

**microbiology** 40:22  
 170:15  
**microorganisms**  
 176:21  
**middle** 11:1  
**Midwest** 164:4  
**Miles** 17:16,21  
**milk** 85:21  
**milligrams** 24:20  
**million** 66:8  
**millions** 64:6  
**mind** 48:9  
**mine** 182:11 183:3  
**mineralized** 87:20  
**minimal** 42:20,20 168:2  
**minimalizing** 21:13  
**minor** 132:12  
**minute** 7:16  
**minutes** 7:15 102:8  
**misclarification** 145:1  
**Misiewicz** 102:10,17,18  
 104:16,19 107:1  
 108:12  
**missed** 6:20  
**mistaken** 50:14  
**mistakes** 152:8  
**mitigate** 106:7  
**mitigating** 13:7  
**mitigation** 85:14  
**mix** 145:11  
**mixer** 169:17  
**mixes** 127:19  
**modern** 177:21  
**Modernization** 16:10  
 19:21 20:12  
**modification** 171:22  
 172:12 173:11  
**modifications** 132:13  
**modify** 33:22  
**moment** 5:17 183:6  
**moms** 160:18 161:11  
**monitor** 84:9  
**monitored** 70:10  
**monitoring** 124:2  
 129:12,16,20 181:2  
**month** 123:14 137:7  
 173:1  
**months** 148:5,17  
 150:16,16  
**morning** 31:15 94:10  
**Mortensen** 1:16 9:7,8  
 152:19 154:20 155:9  
 156:12 179:10 180:1  
**MOSA** 56:16  
**moss** 127:17 129:4  
 179:16  
**Mosso** 1:17 9:10,11  
**move** 7:21 82:19 84:6

86:4 93:11 101:13  
 108:19 121:5 152:20  
 171:6 180:3 184:16  
**movement** 32:1  
**moving** 14:6 43:15 59:4  
 139:16 164:21  
**mulch** 21:16 22:4,18  
 23:6,8,12 24:1,3,6,14  
 27:8 29:6,8,12 30:10  
 30:15 54:19 55:1,12  
 123:15 149:14  
**mulched** 149:2,2  
**mulches** 54:18  
**mulching** 149:9  
**multiple** 20:7  
**multitude** 19:9  
**music** 6:12  
**mute** 6:9,10,10 90:14  
 111:5 114:13 120:16  
 143:12 144:9 158:12  
 160:6 178:10  
**muted** 7:5 10:9 56:7  
 106:13 114:16  
**mycorrhizal** 91:12,17

---

**N**


---

**NALLY** 2:15  
**name** 7:7 10:17,19  
 14:12 26:22 27:2 31:7  
 37:4,7,19,20 39:16  
 44:1,2 52:5,8 56:12  
 56:15 62:15 63:18  
 67:7 83:9 86:13,17  
 93:20 94:11 101:18  
 102:15,17 109:5,7  
 115:15,17 118:1  
 121:12 135:8,10  
 140:14,17 160:14,17  
 165:6 175:8 180:13  
 180:15 184:22  
**name's** 86:19 121:13  
 165:11 185:2  
**national** 1:3,8 2:14 4:4  
 4:6,15,19,21 5:2,5,8  
 5:13 10:20 16:17 17:1  
 17:11 51:17 64:7  
 103:12 116:8 162:18  
 189:1  
**nationwide** 94:17  
**native** 15:5 34:2,4  
**natural** 45:18 54:6,14  
 55:3 73:20 80:3 112:1  
 122:15 123:15 124:1  
 176:5,12,20 177:1,2,9  
 177:13  
**naturally** 80:10 130:13  
 177:12  
**near** 12:10

**nearby** 155:10  
**necessary** 23:1 143:7  
 163:8  
**need** 14:1 20:10 38:4,9  
 38:22 42:12 45:12  
 47:7 54:3 57:13 84:1  
 85:5 90:9 95:4 104:9  
 110:13 116:4 133:10  
 142:7,17 148:3,16  
 151:15,18 154:17  
 161:4,5,6 179:21  
 183:7,18 186:12,21  
**needed** 12:19 22:21  
 25:1 83:19 109:16  
 126:19 144:20 156:21  
 172:14  
**needs** 15:6 32:2 81:4  
 88:6 89:17 105:14  
 129:17 141:11 142:3  
 154:7,13 172:17  
 175:19 188:4  
**negative** 12:14 55:2  
 84:22 106:3 177:19  
**neighbor** 155:4,10  
**neither** 50:12 102:6  
**Nell** 108:22 115:5,7,17  
 115:18  
**network** 64:4 94:17  
**neutral** 106:3  
**never** 87:19 88:1 95:15  
 185:17  
**new** 28:3 33:18 41:19  
 51:1 57:20 91:11  
 104:20 133:10 159:9  
 159:13,14 174:2  
 177:17 181:22  
**nice** 189:10  
**Nicole** 43:9,21 51:22  
 52:2,8 55:19,20,21  
**nine** 84:10  
**nitrate** 65:1 68:16 69:5  
 69:12 70:8 79:8 80:6  
 80:15,17,19 81:4,12  
 89:14 153:1 155:18  
**nitrates** 68:3,11,13  
 78:21 79:9,10,14,15  
 81:15 88:13,14,17  
 92:5 142:5  
**nitrogen** 69:10,16 79:9  
 141:11,13,21 142:2  
 142:12 145:6,15  
 146:12 147:12,20  
 148:1,4,11 155:14  
**NOC** 10:22 11:6,16 12:1  
 52:17,20 53:22 55:16  
**NOC's** 11:3 12:8 52:19  
**NOLA** 52:10  
**non-** 55:8 79:1 116:2

**non-certified** 33:4,8  
 35:19  
**non-crop** 124:6  
**non-GMO** 96:2  
**non-GMOs** 182:13  
**non-organic** 53:1 95:14  
 97:20 155:7  
**non-soil** 71:7 72:13  
**non-synthetic** 112:14  
**nonprofit** 102:20  
**NOP** 4:20 13:14 14:15  
 17:17 21:3 24:8 30:16  
 32:9 34:21 35:3 83:16  
 84:9 119:4 137:4  
 139:9,17 172:14,16  
**NOP's** 173:20  
**NOPs** 84:16 104:20  
**NOSB** 2:13 4:8,10  
 11:10,18,20 13:13  
 14:14,21 31:15 34:5  
 42:4 57:8 60:9 64:7  
 66:21 67:11 85:3  
 94:21 103:20 105:9  
 118:9 136:7 162:7  
 163:11 172:10 173:4  
 173:19,21 174:5  
 177:20 181:20 187:22  
**NOSB's** 12:2 57:2 84:5  
 143:1 171:17,18  
 174:11  
**note** 89:15 137:3  
**notes** 60:4 111:13  
**notify** 136:17  
**November** 4:17  
**NSOB** 21:3 24:5  
**number** 7:2,5 16:7,20  
 31:3 39:15 56:5 62:5  
 62:16 64:20 78:8  
 91:11 93:18,22 94:3  
 103:18 112:16,17  
 115:13 122:6 129:20  
 132:15 140:9 162:19  
 163:10 181:14 183:20  
 185:22 186:3 187:5  
**numbers** 7:3 64:19  
**numerical** 130:5  
**numerous** 170:18  
**nutrient** 80:12,14 91:14  
 166:22  
**nutrients** 87:4,7,21  
 89:5,14 91:9 168:10  
 179:17  
**nutrition** 142:7 148:17  
 154:3 155:1 163:11  
 163:13,15,16  
**nuts** 33:12

---

**O**


---

**Oakley** 1:18 9:13,14  
 106:14,17 108:4  
 158:3,6  
**obstacles** 131:11  
**obvious** 173:19  
**obviously** 46:18 60:12  
 76:3,10 163:8 168:6  
**OCA** 64:3  
**occur** 58:11  
**occurring** 80:10  
**October** 1:7 4:17  
**OEFFA** 85:12  
**offer** 57:18 59:18 118:7  
**Office** 84:12  
**official** 34:8 47:9  
**Ohio** 83:12  
**oil** 33:12 84:17,22  
**Okie** 61:18  
**Oklahoma** 84:21  
**olive** 33:12  
**OLPP** 58:3  
**OMRI** 89:3  
**on-farm** 97:7 98:1,6,21  
**once** 39:11 43:14 62:9  
 62:13,17 78:11 83:5  
 101:14 102:1 114:12  
 119:3 160:21  
**one-quarter** 186:5  
**one-tenth** 186:10  
**one-way** 14:1  
**ongoing** 13:15 103:18  
 103:21 116:22  
**online** 8:9 64:8 71:8  
 104:22 171:9 173:8  
**onsite** 124:21  
**open** 13:14 14:2 149:12  
 150:2,19  
**Opening** 3:5  
**opens** 159:9  
**operates** 5:2  
**operation** 33:5 35:19  
 37:22 38:5 85:19  
 112:4,15,16 118:18  
 118:21 120:6 124:17  
 128:22 130:3 136:11  
**operations** 13:8 15:12  
 15:13 33:9 36:15  
 49:21 56:17,18 57:9  
 85:7 112:11 122:4,10  
 125:18,20 129:13,21  
 130:7 132:7,8,12,17  
 133:1,4,9 134:3,5  
 135:21 136:15 137:8  
 137:10,21 138:1,5,12  
 138:17 139:12 165:15  
 171:17 172:1,11  
 173:12 174:7  
**operator** 36:6 61:3,6

**operators** 85:6  
**opinion** 39:4 95:22  
 179:1  
**opinions** 89:11 131:7  
 165:10  
**opportunities** 21:2  
 159:14  
**opportunity** 4:13 14:16  
 21:3 52:13 57:1 64:9  
 117:9 118:5 174:17  
**opposed** 74:6 81:21  
 119:21  
**opposite** 99:3  
**option** 104:17 112:8  
**options** 112:2  
**oral** 14:16  
**order** 6:16 15:22 17:8  
 22:17 101:4 130:13  
 142:12 162:10 183:5  
**Oregon** 135:3,12,17  
 136:17 137:8 180:17  
 185:8  
**organically** 49:8 88:15  
 92:16 158:19 183:19  
 185:7,14  
**organics** 14:18 17:22  
 18:1,3 26:13 28:16  
 29:14 45:2 46:14  
 47:18 161:5 162:22  
**organisms** 80:12  
**organization** 27:20  
 73:15 77:8 102:20  
 131:8  
**organizations** 10:22  
 163:12  
**originally** 51:16  
**OS** 52:19  
**OSP** 111:22 118:11  
 122:18,22 123:3  
**OSPs** 123:5  
**OTA** 171:18 172:8,15  
 174:8  
**outbreak** 58:8  
**outbreaks** 58:21  
**outcome** 168:13  
**outcomes** 28:8 29:2  
 181:2  
**outdoor** 13:2 124:4  
**outlet** 22:11  
**outline** 59:17  
**outlined** 84:11 86:3  
**output** 29:21  
**outside** 54:19 91:21  
 124:8,13 130:9  
 136:17  
**Overgaag** 165:1 171:7  
 175:3,4,10,10 179:2  
 179:14

overlooked 83:21  
oversight 84:13 173:22  
174:16  
owned 175:14 182:11  
Oxnard 140:18  
oxytetracycline 16:19  
oxytocin 111:21,22  
112:2,5 113:3,16  
ozone 20:8

---

**P**

---

**P-R-O-C-E-E-D-I-N-G-S**  
4:1  
p.m 1:9 4:2 189:6,14  
Pacific 188:18  
packing 19:2,4 37:17  
page 98:22 99:17  
pain 29:7 37:12  
paint 47:10 182:2  
pamphlets 184:9  
panacea 17:7  
parallel 47:11  
parameters 57:8  
parasite 58:5 110:6,11  
110:14 114:3  
parasites 58:13,18  
parasiticide 55:15  
parasiticides 56:21  
59:2 60:6  
parents 164:9  
parsed 166:22  
part 4:15 45:4 51:2 61:2  
61:9 109:19 110:6  
138:2 147:19  
**PARTICIPANT** 70:14,20  
participants 27:6  
participation 4:11  
11:17 65:22  
particular 12:18 29:3  
32:6 104:9 159:1  
particularly 18:15  
21:17 59:16 65:16  
80:18 103:9 104:20  
145:12  
partners 11:1  
parts 66:7  
party 38:13  
pass 130:2  
passage 173:15  
passed 74:14  
passing 172:8  
passionate 65:16  
159:16  
pasture 13:2 49:9 58:22  
85:18  
pastured 49:6  
path 95:16 174:9  
pathogens 16:2 19:14

19:19  
paths 103:18  
patient 57:5  
pattern 101:3  
**PATTILLO** 2:18  
Paul 2:11 3:3 4:5 5:16  
Paula 131:19  
**PAVONE** 2:17  
pay 166:5  
paying 90:3  
**PE** 23:8,13  
peat 127:17 129:4  
179:16  
**Pennsylvania** 84:21  
people 42:3,11 45:15  
45:16,19 46:15 47:12  
48:6 51:14 61:10 63:8  
64:5,21 65:10 68:17  
71:2,3 74:10 79:21  
97:9,11 133:1 151:15  
152:8 170:6,7 181:8  
183:19 184:10  
peppers 122:11  
peracetic 18:21  
perceive 48:10  
percent 22:20 65:11,12  
72:21 76:21,21 77:10  
78:4,5 81:14 91:22  
125:13,14,18,20  
126:7 128:2 133:18  
134:2 141:11,13  
143:20 145:21,21  
148:1 153:5,17,17,19  
154:11 162:21 163:16  
164:3,7,10 175:13  
179:12 181:13 186:1  
percentage 65:5 125:14  
125:22 126:3 129:16  
153:6 179:20  
perception 29:19 45:17  
46:4 47:17 76:16  
perennial 122:6 123:17  
127:16 141:17 144:15  
146:15 147:21  
perfect 17:10 160:13  
perform 98:13 99:9  
performance 30:4,8,11  
95:19  
performance-based  
96:19  
performances 23:13  
period 6:15,19 32:15  
153:7 186:8  
perlite 127:17  
permanently 58:12  
permission 35:11  
permitted 137:11  
peroxide 18:22

person 89:7 111:20  
162:2  
personal 170:17  
personally 47:20  
125:17 168:12  
perspective 108:1  
129:6 132:14 161:3  
174:19  
pertaining 7:9  
pest 104:2 107:8  
pesticide 47:20 109:11  
162:4  
pesticides 40:17 76:17  
155:20 166:11,20  
167:13 168:11  
Pete 175:7,10 180:1  
Peter 108:22 115:1,4,8  
115:15,17 117:12,13  
117:16 165:1 171:7,8  
171:10 175:3,3,6  
Peter's 115:3  
petition 29:17 64:16,17  
petitions 29:13  
petroleum 26:5  
petroleum-based 26:12  
Pew 65:9 77:19,20  
philosophy 75:6  
phone 7:2,3,4 31:3  
39:14 56:5 62:5,16  
63:12 93:18 115:13  
115:13 140:8 175:5  
photographs 123:1  
photos 130:8,8,12  
phrase 75:17  
picked 26:8  
picture 29:10 85:8  
155:12 182:2  
pictures 55:13  
piece 48:7 78:1 80:8  
150:16 158:22 159:8  
pigs 49:5  
pilot 32:20  
pioneer 99:4 100:18  
pipelines 85:9  
place 11:10 28:11 58:7  
58:18 130:18 145:5  
157:6 166:15 174:3  
174:15  
placed 83:16 123:19  
placement 60:16 61:16  
placements 57:18  
places 33:17 41:10 51:6  
plan 38:10 58:6,7 85:14  
119:17 120:7,8  
129:10  
planet 21:9 22:3 28:1  
42:13 183:22  
planned 58:8

plans 57:9  
plant 13:5 23:20 26:8  
32:8 46:9 69:11 80:11  
87:9,17,22 89:13 91:8  
91:13,14 103:10  
124:4 142:3,6 143:7  
145:3,6,8 146:17,18  
146:20 148:3,13,16  
152:14 153:10 154:5  
154:8,11,13,15,17  
156:5 157:3 169:14  
186:13  
plant's 92:21 141:11  
planted 129:17  
planting 53:9 141:12,21  
142:1 148:2  
plantings 129:18 130:9  
plants 26:9 46:13 53:20  
54:17 66:22 80:16  
87:4,19 88:11 89:13  
92:11 155:1 175:22  
176:15,22 177:2,6,8  
179:21  
plastic 55:8,11 149:11  
plastics 149:19  
playing 84:9  
please 4:20 6:5,8 14:12  
21:7,15 22:6 23:5  
50:14 80:5 82:1 84:7  
86:2 93:21 114:13  
144:9 169:3 171:9  
pleased 48:20 103:9  
point 7:20 66:7 70:1  
90:9 96:1 100:1  
129:21 150:12 154:4  
pointed 66:14  
points 19:18 29:7 69:8  
90:11 95:11 143:22  
153:13 159:17 162:8  
policies 136:5  
policy 2:17,20 56:16  
115:18 131:19 136:9  
136:13,20 137:3,6  
138:13  
Political 64:2  
poll 165:17  
polled 166:8  
pollinator 124:5 129:18  
pollute 186:8  
polyethylene 21:16  
22:1,4,18 29:4 149:15  
Pool 102:14 108:22  
117:18 118:2,2  
119:15,22 120:13  
poorly 166:22  
population 181:7,10  
portion 150:5 151:19  
183:8

**portions** 123:22  
**Portland** 180:17  
**ports** 173:8  
**pose** 29:5  
**posed** 53:22  
**posing** 11:11  
**position** 57:2 73:16  
 114:4 169:8  
**possession** 44:22  
**possibility** 162:9 183:8  
**possible** 11:12 27:13  
 32:20 74:5 109:22  
 141:15 183:19  
**possibly** 50:17 136:7  
 186:4  
**Post** 66:18  
**posting** 13:19  
**pot** 146:17,18 147:12  
 148:1,8,11 150:1  
 152:7 153:4,22  
**potassium** 115:22  
 116:1  
**potential** 65:17 75:13  
 181:2,10  
**potentially** 51:3 109:16  
 112:18 149:10 181:22  
**pots** 51:6 53:19 149:17  
 153:15  
**potting** 50:17  
**poultry** 12:18  
**powder** 104:4  
**practical** 142:16  
**practice** 67:7 151:18  
**practices** 12:21 17:5  
 27:12,13,22 28:17  
 54:21 58:1 66:12  
 67:10 104:11,13  
 106:22 107:3 109:22  
 110:2 122:13 130:13  
 139:20 141:7 167:3  
 182:9 183:1,13  
**precedent-setting**  
 59:21  
**precise** 152:6,11  
**predators** 107:8,16,18  
 108:3  
**prefer** 161:11,14  
**preference** 96:19  
**preferred** 53:17  
**premium** 42:2  
**preparing** 5:6  
**prescriptive** 53:4  
**present** 1:10 2:9 6:17  
 8:6,18,22 9:14,16,21  
 10:6 23:18 57:15  
 117:7 141:12 170:10  
**presentation** 154:21  
**presiding** 1:9

**pressed** 30:20 89:8  
**pressure** 167:22  
**pressured** 154:1  
**Preston** 121:8 135:4  
 140:6,11,13,17  
 154:20 159:20  
**pretty** 31:18 71:5  
 128:18 131:6 157:11  
**prevent** 58:2 59:14 85:7  
 110:15 172:17 187:11  
**prevented** 22:2  
**preventing** 13:7,12  
**prevention** 58:7,16  
 110:6  
**preventive** 58:1  
**previously** 22:22  
 137:11 150:7 186:18  
**price** 42:2 183:2  
**priced** 183:14  
**prices** 104:17  
**primarily** 21:1 136:16  
**primary** 162:5 181:4  
**principle** 67:12  
**principles** 54:8,12  
**prior** 5:20 136:19  
 141:21  
**priorities** 12:3,6 103:5  
 103:8,10,13,16,20  
 104:7 105:3 106:19  
**prioritization** 106:4  
**priority** 12:16 13:4  
 28:16 103:7 108:11  
 108:14 116:18 172:20  
**probably** 57:15 120:9  
 127:8 130:10 148:4  
 152:3  
**problem** 13:10,12 33:5  
 36:10 63:7 68:18  
 90:20 91:4 117:21  
 120:13 162:1  
**problematic** 80:18  
**problems** 98:12  
**procedure** 136:6  
**procedures** 173:22  
**proceed** 165:7  
**process** 10:21 11:18  
 13:16,21 14:17 15:13  
 15:22 29:18,20 57:5  
 96:3,12 145:5 151:10  
 176:7  
**processes** 30:1 73:12  
 157:5  
**processors** 52:12  
**produce** 21:19 40:16  
 41:1,7,12 42:17 47:19  
 50:3 74:4 162:3  
 175:11 182:14 184:7  
 187:3

**produced** 49:15 80:2  
 88:16  
**producer** 89:10 94:14  
 98:8 124:22 155:16  
**producers** 16:12 52:15  
 53:1,14 54:6,18 55:5  
 55:7,10 83:18 84:14  
 113:11 122:14,18,21  
 123:4,6,21 124:4,7,15  
 124:16,18 126:4  
 127:11,11,16 128:2  
 187:6  
**produces** 177:3  
**product** 20:1 30:3 37:4  
 38:4 44:19,19 45:1  
 49:15 71:20 72:9 75:3  
 94:18 145:13 162:13  
 167:3 168:4  
**production** 13:6 15:6  
 15:13,16,20 16:15  
 28:21 40:21 45:8,9,12  
 45:13 46:21 49:3,13  
 50:9,16 53:19 54:2,8  
 54:17,19 66:12,22  
 72:1 75:8 79:3,4,10  
 81:16 82:10 105:16  
 105:18 106:2 116:1  
 118:13,17,19,20  
 120:10 121:21 122:3  
 123:2,22 124:13,18  
 125:2 128:10 140:21  
 143:4 144:20 150:5  
 152:5 155:3,10 156:2  
 156:3,8,9,17,18 157:1  
 157:14 158:9,10,11  
**products** 26:5 33:15,20  
 36:8,19 38:15 40:4  
 44:22 47:3 75:7 83:21  
 89:6,19 106:6 136:3  
 136:10,13,16 138:5  
 146:21 147:2 151:21  
 155:8 157:12 167:18  
 168:1 174:1 175:13  
 176:1,8,9 177:5 178:3  
 183:14 184:4  
**professional** 21:9  
 37:10  
**professionally** 95:20  
**program** 4:7,19,21 5:9  
 17:11 28:5,6 32:20  
 41:9 52:11 60:9 64:7  
 135:12 162:18 172:21  
 178:6 189:2  
**programs** 11:5 102:19  
**prohibited** 32:4 116:9  
 118:22  
**project** 104:3 181:6  
**projects** 103:15,19,21

**promote** 54:22 66:9  
 73:14 143:7  
**promotes** 73:15  
**proof** 88:20  
**proper** 16:5 27:14  
 87:18  
**properly** 170:14  
**properties** 23:4  
**proposal** 15:4 32:2  
 33:17,22 34:6 38:2  
 55:17 57:10 59:4  
 60:12 64:11,17 66:14  
 68:6,8 69:8 80:8 81:1  
 81:3,5 109:11 115:22  
 116:5,7 121:20 134:4  
 135:22 138:16 139:6  
 139:15 141:2,6,10  
 142:17 143:2,5  
 171:21 172:8 173:4  
 174:18  
**proposals** 115:20  
**propose** 30:6 174:5  
 184:2  
**proposed** 22:14 57:20  
 59:1 85:2 109:17,18  
 110:11 116:16 132:10  
 132:17 133:14 142:22  
 171:17 174:10  
**proposing** 60:15  
 130:22  
**prospective** 77:15  
**protect** 34:4 95:9  
 162:11 187:13  
**protected** 162:14  
**Protection** 173:3  
**protein** 12:21 187:19  
**protocols** 96:4  
**prove** 97:16 98:3  
**proven** 87:11  
**provide** 4:14 12:21  
 14:16 22:21 60:8 85:6  
 94:18 126:20 129:19  
 135:16 136:18 159:10  
 173:21 174:18 182:13  
**provided** 59:5 110:2  
 116:5 138:2 141:14  
 186:6  
**provides** 4:13 174:14  
**providing** 4:19 20:1  
 61:3 64:8 85:13 95:6  
**pruned** 148:22  
**prunings** 147:15  
**public** 1:5 3:11 4:9,9,14  
 4:16 5:5,20 6:15 7:12  
 13:15,18 14:16 29:16  
 29:19 64:8 70:18  
 74:17 188:17,20  
 189:5

**publications** 28:13  
**published** 78:2  
**pull** 146:17  
**pump** 73:21  
**purchase** 136:10 137:8  
 137:11,20  
**purchases** 138:7  
**purchasing** 138:4  
**pure** 11:18 155:17  
**purely** 142:16 147:1  
**purity** 34:22  
**purpose** 141:1  
**pursue** 165:21  
**pursuing** 172:15  
**purview** 46:18  
**pushed** 142:5  
**pushing** 12:4 35:7  
**put** 6:11 12:2 32:2,18  
 33:19 60:14 66:19  
 111:4 120:16 134:9  
 134:15 141:4,6 143:2  
 145:4 146:18 147:22  
 148:8,19 151:15  
 154:16 158:12 160:12  
**puts** 37:14 166:15  
**putting** 22:15 61:10  
 128:3,6 132:22

---

**Q**


---

**qualifies** 167:8  
**quality** 48:13,20 51:15  
 159:10 163:2 183:15  
**quantified** 107:21  
**quantifies** 106:5  
**quantity** 152:6  
**question** 22:14 24:12  
 25:19 34:14 35:14,18  
 36:15,16,17 40:9  
 45:22 49:17 67:19  
 70:16 74:8 75:1 76:13  
 76:14 78:16 79:17  
 81:20 87:2 91:1,6  
 97:10 100:4 106:12  
 106:13 108:7 111:18  
 113:20,22 114:2  
 119:9 125:11 126:16  
 127:20 129:7 130:16  
 132:4 134:12 143:15  
 143:17 146:6 147:14  
 149:8 150:22,22  
 152:18 157:22 168:19  
 170:3 178:19  
**questions** 7:12,20  
 11:12 14:6 18:6 24:10  
 30:18,22 34:17 36:13  
 36:15 39:5 43:7 47:15  
 49:17 51:19 53:22  
 55:20,20 59:18 60:1

61:15 62:1 67:17  
 70:18 80:5 82:17 86:6  
 90:22 93:10 97:4  
 101:9 106:11 108:5  
 108:16 110:18 114:7  
 117:6,13,15 119:8  
 121:4 125:5 131:21  
 134:21 135:2 138:22  
 140:2 143:10 147:10  
 152:20 157:21 159:21  
 164:17,19 168:18  
 174:21 178:8,12  
 180:3 184:14 188:10  
 188:22  
**quick** 70:22 84:5 91:6  
 146:6 156:13 178:18  
**quicker** 152:15  
**quickly** 58:19 60:3  
 69:11 112:10  
**quiet** 189:10  
**quite** 67:22 119:11  
 126:6,17 127:5  
 158:20 168:20  
**quote** 67:6 109:19  
 182:4

---

**R**


---

**radiation** 167:17  
**rain** 163:5,9  
**raise** 49:5  
**raised** 49:8  
**Ranch** 140:17  
**range** 25:5,6 77:22  
 145:19 146:8  
**rare** 61:5  
**rate** 75:7,8  
**re-listing** 15:14 16:13  
**reach** 64:4  
**reached** 113:6  
**reactor** 29:22  
**read** 38:22 68:7 80:8  
**reading** 67:5 79:1 139:4  
 181:1  
**ready** 8:4 33:16 86:15  
 175:5  
**real** 13:18 20:11 57:13  
 75:16 164:10 167:21  
 182:5  
**realistic** 47:10  
**realized** 22:1  
**reason** 18:1 64:21  
 74:20 88:11 171:1  
**reasonable** 51:7  
**reasoning** 67:3  
**reasons** 65:7 92:14  
 185:21  
**receipt** 137:14  
**receive** 58:14

**recess** 189:5  
**recirculate** 185:22  
**reclassify** 115:22  
**recognize** 44:18  
**recognized** 26:3  
**recommend** 24:7 30:15  
**recommendation** 52:20  
 57:6 66:21 67:4,6,13  
 103:5  
**recommendations** 5:7  
 64:12 84:10 85:15  
 95:6 105:8 132:10  
 141:3 173:21  
**recommending** 57:12  
 108:10  
**record** 7:7 31:8 39:17  
 44:1 52:6 56:13 63:19  
 83:10 86:18 109:5  
 110:22 118:1 129:22  
 135:9 136:11 137:22  
 138:4,11 165:7  
 189:14  
**record-keeping** 52:22  
**records** 138:7  
**recover** 99:20  
**recycle** 55:8  
**recycled** 51:3  
**recyclers** 22:7  
**recycling** 55:6  
**reduce** 29:7 73:7,8  
 105:18  
**reduced** 21:21  
**reduces** 141:21  
**reducing** 46:21 176:1  
**reduction** 21:20 23:16  
**referred** 177:17  
**reflect** 116:1  
**refrigeration** 72:20  
**regard** 29:12  
**regarding** 12:7 52:18  
 54:1 105:15 106:20  
 152:22 161:10  
**regardless** 91:10  
 183:15  
**regards** 53:13 141:9  
**Regeneration** 65:20  
**regenerative** 73:12  
**regionally** 11:5  
**regions** 177:11  
**regular** 58:21 59:2  
 81:22  
**regularly** 88:3 103:17  
**regulation** 30:12 61:7  
 97:19 147:3  
**regulations** 53:6 55:18  
 70:11 110:13 122:16  
 141:7 142:22 143:4  
 172:5,13 173:11,17

**regulatory** 171:22  
 173:6  
**reinforces** 174:12  
**reiterate** 164:8  
**relate** 12:6  
**related** 44:9 71:14  
 103:10 121:21 149:8  
**relation** 24:15  
**relationships** 46:13  
 80:10  
**relaxing** 188:5  
**release** 105:22  
**released** 87:21  
**relevant** 7:8 10:18  
 14:12 29:13 90:11  
 104:20 137:2 173:4  
**reliable** 34:9  
**reliant** 92:1  
**relies** 40:21  
**relisting** 12:9  
**rely** 19:11,12 88:14  
 103:13  
**remain** 15:11 42:5  
**remaining** 6:18 122:9  
 163:1  
**remains** 85:21  
**Remarks** 3:5  
**remedy** 81:6  
**remember** 6:9 60:13  
 105:22 118:11  
**remind** 96:13  
**removal** 16:18 112:13  
**remove** 24:8 30:16  
 113:2  
**removed** 23:14 113:8  
**removing** 113:13  
**renewable** 54:9 186:6  
**renewal** 15:8  
**replace** 74:2  
**replenished** 128:11  
**replenishing** 128:9  
**report** 78:2 84:11  
**reports** 45:17 187:5  
**represent** 18:3  
**representation** 105:11  
**Representative** 173:2  
**represented** 105:10,14  
**representing** 31:16  
 137:16  
**represents** 17:14  
**request** 30:14,16 105:9  
 139:10,16 163:11  
 173:20  
**requesting** 105:11  
**require** 36:18 53:17  
 54:13 133:19 134:2  
 145:5 147:4 174:6  
 184:4

**required** 25:3 29:1 54:6  
54:20 55:8,10 64:14  
110:8 124:1 147:22  
148:17 168:3  
**requirement** 16:11  
19:22 52:22 82:5,14  
82:15 130:14  
**requirements** 80:16  
132:18 136:12 138:11  
142:12 186:10  
**requires** 22:19 53:6,10  
84:18 97:19 122:21  
136:14 137:7 173:6  
**requiring** 53:11 59:14  
81:6 82:10 182:8  
**research** 11:4 12:3,5,12  
12:16 13:3,10 24:3  
65:9 70:2 77:20,20  
102:21 103:5,6,10,13  
103:14,19,20 104:7  
105:2,12,13,17 106:5  
106:19 107:9,12  
108:8,8,10,12 116:18  
153:4 186:16 188:13  
**researchers** 107:15  
116:20  
**researching** 40:7  
**residues** 47:20 55:4,6  
**resistance** 16:1 18:11  
113:13  
**resolution** 109:15  
**resource** 40:19 42:21  
54:9 104:21 122:15  
**resources** 11:6 21:13  
29:1 40:18 42:7,14  
124:1 133:6 138:3  
142:15 154:18  
**respect** 70:14 124:21  
**respective** 7:16  
**response** 86:8 101:10  
108:17 117:14 134:22  
140:3 164:18 174:22  
178:16 184:15 188:11  
**responsibility** 21:10  
181:21  
**responsible** 21:8,12  
23:21 55:6  
**rest** 176:17  
**restrictions** 142:13  
**result** 27:17 58:21  
79:14 139:14 173:1  
**resulting** 30:3  
**results** 95:21 163:14  
176:7 177:3  
**retailer** 94:14  
**retain** 42:1  
**retained** 112:13  
**reused** 147:17

**reverse** 65:17 73:9 76:4  
**reversing** 73:3  
**review** 15:15 16:14 88:5  
88:8 107:13 119:5  
129:10  
**reviewed** 29:15 122:1,5  
122:10 124:11,19  
125:18  
**reviewer** 124:21 132:6  
**reviewer's** 129:6  
**revision** 142:20  
**rhizospheric** 80:12  
**rice** 1:19 9:15,16 104:3  
139:2  
**Rider** 140:18  
**rinse** 19:1  
**rises** 164:5  
**rising** 83:16 164:3  
**risk** 35:22  
**River** 94:12,13 95:3  
99:2  
**rivers** 48:14,17  
**road** 61:4 148:18  
**roads** 119:1 120:5  
**roadways** 118:15 120:2  
**robust** 40:22 60:8  
**rock** 127:14 186:18  
**role** 27:9 140:20 172:4  
**roll** 3:8 8:6  
**Romero-Briones** 1:20  
9:18,19 30:19  
**rooftops** 186:20  
**root** 80:17 91:15 141:22  
142:6 169:13  
**roots** 26:8 80:11 87:19  
91:13 147:20 154:15  
156:5 169:16 176:17  
176:22  
**rotate** 18:10 46:9  
**rotational** 49:10  
**rotations** 123:14  
**routes** 112:12 129:20  
**routine** 59:2  
**row** 114:19  
**rows** 149:17 150:1  
**rule** 57:11,19,20 58:3  
60:15 61:2 95:5,7  
100:1  
**rulemaking** 174:4,6,14  
**rules** 61:10,16  
**run** 6:19  
**running** 91:20 150:15  
178:13  
**runoff** 42:20 77:4  
**rushing** 41:15  
**Ruth** 10:16 14:8,8 20:18  
20:19,22 24:10 25:11  
25:21

---

**S**


---

**sacrifice** 183:4  
**safe** 20:1 23:9 27:22  
79:13 103:11 163:19  
**safer** 176:10 177:6  
**safety** 16:7,9 19:21  
20:12 21:8 87:15 88:1  
116:13  
**Sahara** 181:6  
**sale** 38:14  
**sales** 38:18 65:4 136:10  
**salinity** 142:1 148:11  
**sample** 71:11 129:19  
**sand** 176:16  
**sanitize** 19:3  
**sanitizers** 15:18 18:16  
20:4  
**sanitizing** 16:4  
**sasquatch** 66:17 73:17  
75:18 76:8  
**save** 42:13  
**saw** 127:17  
**saying** 29:19 70:2  
71:19 72:5 75:12  
79:18 91:7 127:6  
133:8 155:6,7  
**says** 80:9 99:12  
**Sbarra** 83:2 86:11,15  
86:19,20 87:2 90:19  
91:19 93:14 100:15  
**scenes** 5:11  
**scheduled** 4:17  
**schedules** 14:22  
**scheme** 134:2  
**Schlegel** 26:15  
**Science** 102:19  
**scientific** 102:21  
**scope** 116:8  
**Scott** 1:19 9:15,17  
139:1 140:1  
**screen** 10:7  
**se** 67:14  
**season** 22:19 128:5  
**seasonal** 122:7  
**second** 43:20 63:8  
70:15 71:13 116:6  
137:6 144:8 146:16  
147:14 154:4 166:13  
**secondly** 84:17 143:20  
**Secretary** 1:12  
**sections** 124:3  
**sector** 117:3  
**sector's** 105:13  
**sectors** 11:17  
**security** 66:2  
**seed** 13:5,8 34:22 52:19  
53:1,9 94:12,13,14,16  
95:4 96:3,5,7,10,11

96:14 97:12,13,20,22  
98:4,8,13 99:7,12,17  
99:19,22 100:18,19  
100:22 101:6 117:1,2  
117:3  
**seeds** 94:18 95:14,16  
96:2,8 167:14 179:14  
**seeing** 49:12 60:13  
62:10,16 93:10,22  
94:2 121:4 129:20  
135:1 164:19 165:18  
184:16 188:12  
**seemingly** 175:19  
**seen** 39:10,13 56:4  
79:21 98:6 99:3 102:4  
127:19 130:6 132:7  
149:13 153:4 161:8  
**sees** 5:22  
**Seitz** 1:21 9:20,21  
**sell** 33:16  
**selling** 38:18  
**send** 24:13,18 25:12,15  
26:11 37:17 39:14  
42:4 94:3 115:12  
129:11 186:16 188:13  
**sending** 93:17  
**Senior** 121:14  
**sense** 128:13 141:19  
147:3  
**sensible** 53:4  
**sent** 36:20 141:4  
**sentence** 7:18  
**sentences** 131:1  
**separate** 161:14 164:13  
186:15  
**sequestering** 49:10  
**sequestration** 66:1  
75:12 76:5 77:7  
105:20 106:9  
**series** 188:2  
**serve** 14:22  
**services** 34:8  
**servicing** 4:12 94:22  
**session** 6:3 189:5  
**sessions** 6:3  
**setting** 13:14 60:14  
**setup** 87:18  
**seven** 86:3  
**severely** 143:5  
**severity** 105:19  
**shade** 123:20 129:14  
149:11  
**Shah** 108:22 121:10,13  
121:18 125:17 126:2  
126:8,12 127:7 128:8  
128:21 129:19 131:16  
132:2,14,20 133:2,4  
133:11 134:4,11,17

**SHANNON** 2:15  
**shaped** 172:18  
**share** 122:12 174:18  
 181:19  
**she'll** 117:11  
**sheets** 116:13  
**shelf** 129:12  
**shifting** 89:14  
**ship** 89:19  
**shipments** 136:18  
**shopping** 176:9  
**short** 178:14,16  
**short-sighted** 183:17  
**shortage** 41:10,15  
**shortages** 28:13  
**show** 23:19 92:10 93:5  
 107:3,5 123:8  
**showing** 83:4 107:10  
**sickness** 58:2  
**side** 22:12 71:6 74:8  
 98:10 167:21  
**signal** 42:5  
**signatures** 64:16,18  
**signed** 66:4  
**significant** 33:21 44:15  
 54:5 65:5 84:15 105:5  
 181:18  
**signs** 36:6  
**similar** 146:21 147:2  
 151:21 156:16 163:12  
**simple** 177:20 179:3  
**simply** 14:2 82:4  
**Simultaneous** 63:4  
 111:2  
**sincere** 115:21  
**single** 31:19  
**sir** 70:17 140:12  
**site** 123:22 144:2 146:2  
 146:2 150:20  
**site-specific** 141:17  
 144:4  
**sits** 22:12  
**sitting** 156:5 168:3  
**situation** 34:1 38:19,21  
 58:9 112:5,18 133:6  
 142:2,5,10  
**situations** 112:10 138:7  
**six** 148:4,17 150:15  
**sixth** 5:21  
**size** 37:8 144:17  
**sizer** 19:8  
**skilled** 42:15  
**Slide** 21:7,15 22:6 23:5  
**slightly** 110:9  
**sludge** 167:17  
**small** 36:18 122:6  
 175:15 176:2 179:15  
 179:20

**smaller** 113:12  
**smoothly** 189:3  
**Snow** 52:2 56:3 62:2,4  
**so-called** 66:11 69:14  
**soap-** 118:10 119:11  
**soap-based** 119:13,16  
**social** 64:6  
**society** 47:7  
**softer** 119:1  
**soil-** 50:12  
**soil-based** 45:11,12  
 50:9 51:2 81:22 82:8  
 82:13  
**soil-like** 81:6  
**soilless** 66:16 76:2,6  
 88:8,12 182:7,11  
 183:9 184:2  
**soils** 46:10 66:2 166:22  
**sold** 26:6 37:16 53:19  
**solid** 144:19 145:17  
 146:14 147:1,1 148:7  
 151:6,15,22 153:7  
**solidly** 152:7  
**solution** 91:14  
**solutions** 80:14 103:22  
**solved** 63:6  
**somebody** 22:15  
 114:14 130:19 131:13  
**someday** 183:9  
**somewhat** 61:3  
**Sonnabend** 20:19  
 26:20 31:2,6,9,12,14  
 31:15 34:19 35:6,13  
 35:17 36:3 37:1 38:1  
 38:7 39:2,8  
**soon** 7:18 84:14  
**sooner** 174:13  
**sorghum** 94:16  
**sorry** 5:16 8:10 30:19  
 62:3,14 86:12 90:15  
 90:19 117:19 119:10  
 120:17 126:5 132:20  
 134:11 143:14 144:6  
 144:7 178:11  
**sort** 74:7 101:3 129:18  
 133:21 149:20 165:16  
 165:17,19,22 166:15  
 168:7 169:17  
**sound** 11:15 53:4  
 142:15 185:20  
**sounded** 119:20  
**sounds** 71:9 111:19  
 128:1,17 153:8  
**source** 116:12  
**sources** 137:15 186:7  
**sourcing** 53:8 96:14  
**South** 71:22  
**Southern** 141:18

158:14 185:9  
**soy** 94:15 164:11,12  
**soybean** 145:10  
**spaces** 119:2  
**speak** 21:3 31:18,20  
 47:22 48:3 64:10  
 83:13 91:16,20 112:3  
 113:21 169:2  
**speaker** 6:21 14:7  
 70:16 101:13 121:5  
 158:1 184:17  
**speakers** 63:13  
**speaking** 63:4 111:2  
 114:13 161:2  
**Specialist** 2:13,18  
 109:9 118:3 121:14  
 135:12  
**species** 80:19  
**specific** 7:4 16:1 75:3  
 75:21 124:17 136:16  
 144:2  
**specifically** 46:1 68:14  
 112:4 122:11 127:12  
 139:10,18 161:10  
 171:16  
**specificity** 32:3  
**specified** 29:22  
**specifies** 36:20  
**spectrum** 49:20 50:15  
**spend** 40:6  
**spinach** 80:19  
**split** 137:13  
**spoken** 44:11  
**spot** 99:7,8 132:22  
**spray** 187:8  
**sprayed** 169:16  
**sprayers** 187:9  
**spraying** 155:19 162:14  
 162:16 187:14  
**spread** 58:12 88:7  
**Spring** 59:6 60:11  
**square** 24:13,20  
**squash** 33:12  
**staff** 53:9  
**stakeholder** 15:1 17:12  
 17:19 105:10  
**stakeholders** 14:19  
 27:10 103:16 172:20  
**stand** 18:4  
**standalone** 139:5  
**standard** 30:8,11 51:15  
 51:15,17 74:13  
 130:21 133:15 143:3  
 166:15,16 168:1  
 169:19 170:16  
**standards** 1:3,8 2:11,16  
 2:17,18,20 4:5,6,15  
 5:2,6,9,13 27:21

46:22 47:2 49:7,7  
 51:13 54:6 66:22 96:6  
 96:7 122:15,20 125:1  
 167:5  
**standing** 189:4  
**standpoint** 77:8  
**stands** 17:14 96:3  
**Stanley** 94:1,2 102:2,3  
 102:4  
**star** 6:9,10  
**start** 10:17 14:11 26:22  
 31:7,10 39:16 41:19  
 43:22 52:5,18 56:12  
 73:9 102:15 109:4  
 117:22 121:12 135:8  
 135:22 140:14 148:7  
 148:9 157:3 160:14  
 165:6,14 175:8  
 179:14 180:12 184:22  
**started** 8:5 10:15 83:9  
 94:20 165:16  
**starting** 72:17 99:20  
 128:10 129:21  
**state** 12:8 18:2 44:13  
 82:3 94:19 109:21  
**stated** 59:15 79:19  
 88:22 150:7 151:20  
**statement** 32:6 36:16  
 68:1 141:1 144:1,14  
 146:3,8 181:5  
**statements** 76:15 77:2  
**states** 1:1 46:16 56:17  
 88:8 90:7 109:19  
 110:1 141:10  
**statistics** 48:3  
**statutory** 11:12,15,20  
**stay** 35:9 181:17  
**staying** 51:10  
**steam** 182:4  
**step** 138:17  
**step-up** 60:9  
**steps** 15:20,22 16:5  
 20:7 110:8 117:1  
**sterile** 41:4  
**Steve** 1:15 9:3,6 10:15  
 10:16,17,20 14:5,6  
 70:13 76:13,13 90:22  
 91:1,2 126:14 147:7  
 150:21,22 151:2  
**stewards** 21:9,11 22:3  
 24:2  
**stewardship** 23:22 28:1  
**stomach** 65:3 80:20  
**stones** 114:20  
**stop** 152:20 164:16  
 178:5,13 180:3  
**storage** 33:9,10,10,13  
 33:20 35:21,21 36:5

36:12,20 37:14 38:20  
**storages** 19:4  
**store** 40:6  
**stores** 161:9  
**storing** 80:17  
**straight** 160:15  
**strata** 71:4  
**strategic** 181:3  
**strategies** 104:2  
**strawberries** 107:19  
 122:7 156:17,18  
**strawberry** 107:19  
**streams** 48:14,18  
**strength** 109:14  
**strengthen** 57:3 59:8  
 95:4  
**strengthened** 58:5  
**strengthening** 11:6  
 56:22 59:5 95:7 172:5  
**streptomycin** 16:19  
**stress** 16:16  
**strict** 45:20 51:10  
**strictly** 82:8  
**strides** 95:6  
**strong** 47:2 95:2  
**stronger** 32:12 172:21  
**strongly** 12:12 17:21  
 53:15 54:2 66:21  
 171:21  
**structure** 11:15,21  
 150:6  
**structures** 118:15  
 119:1 120:2,6 122:8  
**students** 185:12,18  
**studied** 75:20  
**studies** 12:19 23:18  
 75:22 88:19 90:9  
 91:12 92:6,8,9 93:8  
 104:9 107:2,5,6  
 170:18  
**study** 65:9 69:6 75:21  
 77:19,21 78:19 90:10  
 93:5  
**stuff** 32:11  
**subcommittee** 1:13  
 35:1 64:11 67:3 69:8  
 80:7 81:1 103:4,8  
 113:3 116:19,22  
 132:11 141:4,5  
**subcommittee's** 67:13  
 68:6,7 116:18 121:20  
**subject** 31:19 32:9  
**subjects** 31:20  
**submit** 93:21 111:10,15  
 130:7,8,12  
**submitted** 64:15 123:3  
 123:5 130:22 131:21  
**substance** 16:2 116:3

**substances** 116:9  
 187:18  
**substrate** 123:11,11  
 124:12 127:15,19  
 128:6 143:18 148:22  
 156:22 179:12  
**substrates** 55:5,7 144:2  
 144:14  
**subvert** 84:3  
**successful** 28:8  
**successfully** 27:14  
**sudangrass** 94:16  
**sudden** 93:2  
**Sue** 1:13 8:8,8 70:13  
 76:13 78:16 110:21  
 113:20,20 114:6  
 168:19 169:1  
**suggest** 53:10 105:1  
 110:5,7  
**suggested** 57:10  
 106:20 110:5,11  
**suggesting** 131:2  
 156:15  
**suggestions** 61:15  
 104:6  
**suitable** 13:1 159:5  
**suited** 159:1  
**sulfate** 12:9  
**summarize** 136:6  
**sun** 54:10 74:2  
**sunflowers** 130:11  
**sunlight** 54:14 64:13  
 67:14 82:3,5,14  
**sunset** 12:7 15:10,15  
 16:14 24:6  
**supplemental** 153:7  
**supply** 41:10,13,15  
 72:17 84:2 135:18,21  
 138:15,17 164:9  
 183:9  
**support** 12:8,12 15:4,8  
 15:14 16:13 52:21  
 57:7 59:7 64:16 67:3  
 72:8 85:5 101:4  
 115:21 118:16 124:22  
 166:6 171:20 172:3  
**supported** 85:13  
**supporting** 27:19,21  
 177:21,22  
**supportive** 171:18  
**supports** 52:19 66:21  
 116:4,17 117:1 123:9  
 172:8 174:8  
**suppress** 73:4  
**surface** 161:18  
**surfaces** 19:11  
**surged** 83:19  
**surrounding** 55:3

**survey** 45:17,22 79:6  
 172:18  
**surveys** 77:9  
**suspended** 87:7,7 91:8  
**sustainability** 180:21  
 182:14  
**sustainable** 27:12,17  
 27:20 28:18 29:5  
 40:20 42:10 177:21  
 185:20  
**Swaffar** 1:12 10:1,2  
 18:7 35:16,18 60:2,17  
 67:20 68:21 69:18,22  
 100:6 101:7 110:20  
 110:22 111:8,17  
 112:9,22 113:2,17  
**swift** 84:16  
**swing** 10:21  
**synthetic** 26:6,7 40:17  
 54:18,19 55:1,15  
 56:21 116:3 167:13  
 169:21 176:6,13  
 177:2  
**syrup** 44:21  
**system** 42:13 45:5  
 46:17 49:3,13 58:17  
 69:15 70:7 73:1,3  
 74:7,10 75:8 76:2,3,3  
 76:4,6,10 80:13 91:18  
 91:20 119:17 120:7,8  
 122:3 123:2,8 128:19  
 129:22 143:21 149:4  
 152:5,10 155:3  
 170:16 171:1 187:16  
**systems** 13:2 19:14  
 40:22 42:18,19 43:1  
 66:16 70:3,4 71:7  
 73:21 74:21 77:3  
 79:10,11 82:6,13  
 87:18 104:3,19  
 105:22 106:2,6  
 121:21 123:16,19  
 124:10 126:22 129:14  
 149:14,22 153:5  
 167:1 170:8,19,20

---

**T**


---

**table** 159:4  
**tag** 37:3,8  
**taken** 16:5 87:22 90:8  
 159:14,17 172:7  
 174:12  
**takes** 15:3 69:11 146:14  
 151:17 174:15  
**talk** 18:8 38:10 98:20  
 109:10 130:18  
**talked** 35:20 49:19  
 60:10 71:2 99:11

**talking** 10:5,11 60:3,10  
 66:11 77:6 78:22 92:7  
 115:19 126:18 127:1  
 130:19 153:1 178:10  
 184:9  
**Tamar** 66:18  
**tank** 87:17  
**tanks** 20:6 170:13  
**tape** 146:22  
**targeted** 12:13  
**tartrate** 115:22 116:2  
**task** 32:17,19 33:1  
 34:22  
**taught** 185:12  
**team** 65:15  
**technical** 42:15 118:3  
 135:11,12  
**technically** 149:4  
**technologies** 23:22  
 24:4 28:3  
**technology** 14:18  
**teleconference** 5:11  
**Telephonic** 62:19 63:10  
 104:15,18  
**tell** 25:15 50:6 97:9  
 143:18 151:5,9 155:2  
 179:11 184:8  
**tells** 126:21  
**temperature** 164:5  
**temperatures** 164:3  
**tempted** 142:11  
**ten** 34:10 126:3,5,6  
 153:19 185:5  
**tend** 100:15 113:11  
**term** 32:7 49:18 134:3  
 139:17 182:18  
**terminology** 134:6  
**terms** 32:5 48:13 49:1,3  
 92:6 93:1  
**terrestrial** 66:22  
**test** 46:9 112:13 163:7  
 163:12  
**tested** 68:11 88:2  
**testimony** 186:15  
**testing** 32:20 81:4 96:4  
**text** 56:5 57:11  
**thanks** 9:16,17 25:16  
 111:6,8 114:14  
 116:21 139:2,19,22  
 154:20 156:12 158:3  
 158:6 169:3,5 188:8  
 189:8  
**thereof** 138:12  
**thiamine** 12:22  
**Thicke** 1:13 10:4 125:7  
 125:11,21 126:5,10  
 133:14 134:8,13,19  
 143:17 145:9,19

**thickness** 22:20 23:13  
23:16  
**things** 17:18 18:20  
33:13 35:3 37:2 40:13  
41:6 45:7 77:5 97:10  
107:7 113:14 127:3  
128:15 130:6 155:21  
167:21 179:18 188:7  
**thinks** 17:20  
**third** 102:2 116:17  
137:19 146:16  
**third-** 38:12  
**third-generation** 85:10  
**third-party** 36:20 38:16  
**thirdly** 40:21  
**thought** 61:9 111:20  
165:18  
**thoughtful** 188:20  
**thoughts** 18:13 44:8  
**thousands** 184:10  
**threat** 164:10  
**three** 7:14,16 34:13  
41:18 85:9 131:1  
163:10 186:9  
**threshold** 110:11  
**thresholds** 110:15  
**thriving** 13:2  
**throw** 114:20 157:21  
**Thursday** 6:4 189:6  
**Tilth** 135:3,12,17  
136:17 137:8 185:8  
**Tim** 171:11 175:7  
180:10 184:17,21  
185:2 188:9,10,12  
**timely** 174:15  
**times** 6:8 178:20  
**timing** 14:4 152:11  
**tipping** 66:7  
**tired** 158:21  
**tireless** 5:10  
**today** 27:7 31:19 52:15  
64:10 74:16 109:10  
115:19 117:10 121:19  
132:9,12 135:16  
141:1 160:19 168:21  
169:7 173:5 182:18  
**today's** 4:4,9 5:11,14  
14:18 27:6 178:20  
183:18  
**told** 83:18 157:18  
**Tom** 1:9,11 3:6,14 5:13  
5:14 8:8,19 10:12  
36:14 43:11 62:7  
90:13 98:16 112:22  
114:12 120:14 143:11  
146:5 158:12 178:9  
189:9  
**tomatoes** 122:11

**tons** 93:3  
**tool** 113:12  
**toolbox** 119:19  
**tools** 27:15 85:13  
156:10 159:14 172:17  
**top** 153:20,22 172:20  
**topic** 27:7 29:10 89:8  
104:8  
**topics** 57:1 59:21  
116:19  
**topped** 123:16  
**torch** 35:5  
**Tosa** 62:4  
**total** 12:21 72:16  
**totally** 75:2,11  
**touched** 150:14 158:7  
**tough** 20:11 146:4  
**tours** 184:10  
**toxic** 65:2 80:20 163:19  
163:22 187:8  
**toxicity** 89:14 92:3  
**toxin** 161:6  
**toxins** 161:18,20 162:6  
**traceability** 136:18  
**tracker** 150:15  
**tracking** 172:22  
**tractor** 89:22  
**tractors** 90:3  
**Tracy** 102:9,12,13,15  
102:17 108:20  
**trade** 171:15 172:22  
**tradeoffs** 107:11  
**trained** 181:1  
**training** 172:4  
**trait** 80:11  
**traits** 13:1  
**transcripts** 8:1,2  
**transform** 30:2  
**transition** 174:3  
**transparency** 172:21  
**transparent** 11:22  
**transportation** 72:20  
**transported** 19:6  
**trap** 73:11  
**trash** 22:15  
**travel** 117:8 118:9  
**treat** 18:18,20 19:1  
**treated** 16:2  
**treating** 18:18 19:19  
**treatment** 58:14  
**treatments** 61:13  
**tree** 18:15  
**trees** 72:18  
**tremendous** 5:22  
**trend** 72:3 73:3,10  
**trends** 181:1  
**trial** 100:8  
**trailing** 97:7,10,15 98:2

98:7  
**trials** 95:17 98:21 99:14  
**tried** 100:11 127:8  
**tries** 81:5 99:6,11  
**Trifecta** 165:12  
**trimmings** 147:16  
148:21  
**trouble** 82:14  
**truck** 85:21  
**true** 67:11  
**truly** 17:20 18:3 187:3  
**trust** 162:15 166:14,14  
**try** 7:17 10:11 33:6 61:6  
100:20,21 101:18  
113:20 120:20 153:22  
**trying** 33:19 34:5,21  
42:11 60:4 88:5 90:17  
91:4 97:16,18 111:13  
128:19 146:21 150:8  
155:12 168:7 178:5  
**TUESDAY** 1:7  
**turn** 5:12 63:21 159:6  
**turned** 50:22  
**twice** 39:11 43:15 62:9  
62:14,17 83:5 101:15  
102:1 161:7  
**two** 6:2,22 19:16 36:15  
48:7 80:5 83:13 99:6  
121:22 123:13 147:9  
153:13 156:4,10  
162:19 164:5 185:8  
185:10,16 186:3  
**two-thirds** 122:5  
**two-way** 13:17  
**type** 25:2 60:9 74:7  
82:10 103:15 173:12  
179:18  
**types** 15:17 25:1,7,7  
80:12 171:22 172:11  
**typical** 112:13 127:18  
**typically** 128:9  
**typing** 114:14

---

**U**


---

**U.K** 68:10,14  
**U.S** 83:20 104:2 136:17  
185:11  
**UC** 107:13  
**ultimate** 72:4  
**ultimately** 40:3  
**unanimously** 32:16  
**unapproved** 187:17  
**unarguably** 11:19  
**unavailable** 141:20  
**unbiased** 95:21 99:15  
**unbuffered** 80:13  
**uncertified** 137:12,16  
173:7  
**unclear** 116:6  
**understand** 13:10 33:5  
35:6 50:13,14 61:4  
72:10 75:2,11 85:3  
166:1 176:4  
**understanding** 26:1  
74:18 78:22 81:11,19  
129:6  
**undertaking** 12:1 108:9  
108:13  
**unethical** 187:15  
**unexpectedly** 28:9  
**unfair** 96:3  
**unfortunately** 11:9  
**uniformity** 152:12  
**uniformly** 152:16  
**uniquely** 85:4  
**United** 1:1 56:17  
**unmute** 5:17 6:10 158:3  
**unmuted** 10:8 31:11  
56:8,9,11  
**unofficially** 100:17  
**unpunished** 95:15  
**unquote** 182:4  
**unrealistic** 34:7  
**unreasonable** 36:18  
**unsustainable** 182:8  
183:11  
**untreated** 99:4 100:19  
**unwanted** 13:7  
**upcoming** 4:16 15:10  
**update** 4:20 64:18  
**updates** 119:4  
**uptake** 87:4 152:14  
**urban** 43:3 88:7  
**urea** 79:7 155:17  
**urge** 33:2,22 67:11  
106:4 177:20  
**urgency** 29:17  
**USA** 177:11  
**usage** 21:12 55:15  
59:13 117:2  
**USDA** 5:7 52:10 84:12  
105:12 162:15 173:6  
173:16 185:7  
**USDA's** 187:4  
**use** 6:10 14:17 15:12  
16:14 17:8 18:15,17  
20:5,6 23:17 29:3  
33:8 40:19 42:21 51:6  
53:1 54:8,11,19 55:10  
56:21 59:2 60:6 66:12  
66:14 77:3 79:7,8  
89:22 90:2 109:11  
112:7,9,18 116:12  
117:5 118:16,22  
119:13 120:9 123:15  
125:20 127:13,16,18

128:2 129:13,21  
130:4 133:19 134:3,6  
134:7 136:19 142:14  
143:18 144:5,19  
145:11,13,13,18  
146:9 149:4,16,21  
150:18 151:11,12  
153:15,21 154:18  
155:7 157:11 166:3  
167:12,14 168:12  
176:12 179:11,13  
182:7,20 183:1,12,21  
184:3 186:1,3,7,13,14

**users** 119:13

**uses** 15:16 79:20  
119:21

**usually** 127:17 169:15  
169:16,20

---

## V

---

**V** 110:6

**vacuoles** 80:17

**vague** 39:2

**valuable** 28:4

**value** 5:22 11:22 45:1

**values** 40:5,10 182:15  
182:17 183:5

**varies** 111:11 112:15

144:15,16 151:7

**varieties** 17:2 96:18

**variety** 15:19 41:12

53:2 95:17 97:13,19

98:4,14,21 99:14

137:15

**various** 14:19 15:17,18

16:2,21 17:19 19:10

19:18 67:10 79:9

115:20

**vary** 124:16

**vast** 124:17

**vegetable** 96:16

**vegetables** 45:9,11

177:15

**vegetation** 123:18

**verbiage** 134:14

**verifiable** 34:11

**verification** 137:20

**verified** 124:3

**verify** 81:2 134:16

138:10 173:22

**verifying** 138:6

**vermicompost** 126:18

127:2 128:4

**vermiculture** 149:5

**Vermont** 44:4,5,20

48:20 52:9,12 54:5

**Vermont's** 52:10

**versus** 61:2 76:2

128:15 149:11 151:6

152:7

**viability** 42:14

**viable** 12:11

**Vice** 1:12

**view** 28:6,10 142:16

**viewing** 28:7

**viewpoint** 28:22

**virtually** 125:14,15

**visit** 36:11,11 80:2

**voice** 103:15

**voices** 105:10

**volcanic** 127:14 177:13

**volumes** 117:3

**vote** 15:10 16:14 24:6

30:14

---

## W

---

**waiting** 13:21

**walk** 40:6

**wanted** 45:19 61:1

109:10 134:9,15,15

139:3

**wanting** 77:10 182:3

**warehouse** 38:16,19

**warehousing** 38:13,17

**warming** 28:15

**warrants** 112:18

**washed** 148:13

**Washington** 66:18

83:16

**wasn't** 75:19 132:20

**waste** 21:14 87:18,20

89:9,10 149:3,4

153:21

**water** 19:5 21:11,21

42:21 48:13,20 51:6

77:4 87:3,4,7,9,9,12

87:21,22 91:8,10

92:13,19,19,22 93:3

159:4 161:13,21

163:5,7 169:13,17,20

170:13 179:22 186:1

**water's** 92:17

**watering** 46:22

**watermelons** 33:12

**Watts** 10:17 14:8 20:18

20:21,22 24:17,22

25:9,12,17,22 26:14

26:18

**way** 12:20 18:4,4 38:11

41:2 44:12,16 46:16

66:10 69:13 72:19

74:4,16 93:5 110:4

111:14 115:2 120:6

127:8 133:21 147:17

152:1 163:21 166:1

168:7 169:18 182:12

182:17

**web** 6:1

**webinar** 1:5,9 4:5,10,13

5:20,21 14:17 27:6

31:4 35:10 117:7

118:6 131:14

**webinars** 118:7

**website** 4:21

**weed** 149:22 150:4,6

**weeding** 150:9 153:21

**weeds** 153:22

**week** 64:5,15

**weight** 24:13

**welcome** 3:2 4:4,8 5:19

9:12 126:12 143:9

**well-being** 12:22

**went** 76:21 119:12

189:3,14

**weren't** 182:20

**whatever's** 157:12

**wheat** 21:20 164:4

**wide** 77:22

**widely** 161:22

**Wiengand** 135:6,10,11

135:15

**wife** 185:4

**wife's** 185:6

**wildlife** 54:22 130:6

**willing** 166:5

**winter** 33:12

**wire** 184:17

**Wisconsin** 84:21 98:12

**wiser** 179:2

**wish** 27:7 98:14

**wither** 87:5

**wonder** 74:3 178:22

**wondering** 72:6 106:18

131:10

**wonks** 61:5

**wood** 123:16 148:22

**word** 161:15 166:8,9,13

182:20 184:3

**wording** 110:4,8

**words** 45:18

**work** 4:11 5:10 10:12

11:22 12:2 27:3,10,18

51:14 52:17 53:21

59:20 66:11 95:1

96:22 97:1,21 98:7

100:11 103:17 109:7

109:13 116:12,22

172:11 174:11

**worked** 85:14 97:14

**working** 10:13 34:21

65:21 98:1 100:10

121:22 139:22 160:5

188:6

**works** 99:12

**world** 181:7 185:7

**worries** 132:21

**worst** 183:1

**wouldn't** 37:19 70:10

126:2 159:5

**Wow** 14:4

**written** 30:12 34:9 39:4

57:17 59:17 82:7 86:3

111:12 131:21 136:19

**wrong** 30:20

**wrote** 38:12 113:4

---

## X

---



---

## Y

---

**YANESSA** 2:15

**yard** 22:16

**year** 85:12 100:11

136:8,14 138:8

141:14,16 146:1,1,16

146:17 150:16 151:6

158:17 173:15 181:13

**year-round** 43:2

**yearly** 142:12

**years** 17:16 34:10,14

41:18 86:21 88:2

100:2 122:1 163:2

167:8 181:13,15,19

185:5,9 186:18

**yield** 21:18 106:2

**young** 159:13

---

## Z

---

**Zak** 115:11,11 121:7

135:3,5,7,7,10 138:21

138:22 139:3 140:2,5

**Zea** 20:19 26:20 31:1,6

31:10,15 34:16,17,18

35:16 36:14,14 39:6,6

**Zen** 135:4 140:7 160:1

160:4,10,17 164:15

164:20

**zone** 141:22 142:6

**Zuckerman** 39:15 43:9

43:16,17 44:2,3 48:2

50:1,19 51:21

---

## 0

---



---

## 1

---

**1,000** 48:6 65:22

**1,700** 56:19

**1:00** 1:9 189:6

**1:03** 188:18

**1:04** 4:2

**10** 3:11 181:19

**100** 91:22 100:21

125:13,14,18,20

126:6 128:2 133:18	<b>5,000</b> 28:11
134:2 153:5 154:11	<b>50</b> 141:10 145:20
162:21 163:16 175:13	146:11 147:22 151:16
<b>108-day</b> 97:17	164:3,7
<b>111</b> 119:13	<b>50-31</b> 172:14
<b>112-day</b> 97:17	<b>50,000</b> 28:7,12
<b>15</b> 182:12	<b>500</b> 172:19
<b>15-</b> 29:12	<b>5029</b> 52:21
<b>15-1</b> 24:8 30:16	<b>511</b> 118:10 119:15
<b>15,000</b> 64:15	<b>52</b> 122:2
<b>150</b> 175:15	<b>57</b> 72:21
<b>188</b> 3:14	
<b>189</b> 3:16	<hr/> <b>6</b> <hr/>
<b>1960's</b> 21:16	<b>6</b> 6:9
<b>1990</b> 74:15	<b>6-copper</b> 12:9
<hr/> <b>2</b> <hr/>	<hr/> <b>7</b> <hr/>
<b>2</b> 4:17 21:15	<b>7</b> 6:10
<b>2,000</b> 48:6 56:17	<b>700</b> 52:11
<b>20</b> 81:14 102:8 141:13	
146:12 163:2 167:8	<hr/> <b>8</b> <hr/>
181:19	<b>8</b> 3:9
<b>2008</b> 185:8	<b>80</b> 145:21 164:10
<b>2009</b> 181:6	<b>88</b> 65:11 76:20 78:3
<b>2010</b> 66:21	
<b>2013</b> 32:9	<hr/> <b>9</b> <hr/>
<b>2014</b> 65:18	<b>9.5</b> 181:7
<b>2016</b> 32:15 45:17 65:9	
77:20	
<b>2017</b> 1:7	
<b>2018</b> 104:7 105:3	
<b>204A</b> 53:7	
<b>205</b> 53:7	
<b>2050</b> 181:8	
<b>238D</b> 57:21	
<b>24</b> 1:7	
<hr/> <b>3</b> <hr/>	
<b>3</b> 22:6	
<b>3,000</b> 89:3	
<b>3,500</b> 126:4	
<b>30</b> 22:20	
<b>31</b> 4:17	
<b>350</b> 66:7	
<b>37</b> 66:4 111:21 112:16	
<hr/> <b>4</b> <hr/>	
<b>4</b> 3:3 23:5	
<b>4.5</b> 181:13	
<b>4:04</b> 189:14	
<b>40</b> 22:20	
<b>400,000</b> 64:5	
<b>44</b> 76:21 77:9	
<b>460</b> 122:1	
<b>48</b> 65:12 78:5	
<hr/> <b>5</b> <hr/>	
<b>5</b> 3:6	

C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Public Comment Webinar

Before: USDA/NOSB

Date: 10-24-17

Place: webinar

was duly recorded and accurately transcribed under  
my direction; further, that said transcript is a  
true and accurate record of the proceedings.

  
-----  
Court Reporter

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

UNITED STATES DEPARTMENT OF AGRICULTURE

+ + + + +

NATIONAL ORGANIC STANDARDS BOARD

+ + + + +

PUBLIC COMMENT WEBINAR

+ + + + +

THURSDAY

OCTOBER 26, 2017

+ + + + +

The National Organic Standards Board  
convened via webinar at 1:00 p.m. Eastern Time,  
Tom Chapman, Chair, presiding.

BOARD MEMBERS PRESENT:

TOM CHAPMAN, Chair  
ASHLEY SWAFFAR, Vice Chair  
JESSE BUIE, Secretary  
FRANCIS THICKE, Crops Subcommittee Chair  
SUE BAIRD  
HARRIET BEHAR  
ASA BRADMAN  
LISA de LIMA  
STEVE ELA  
JOELLE MOSSO  
EMILY OAKLEY  
SCOTT RICE  
A-DAE ROMERO-BRIONES  
DAN SEITZ

**ALSO PRESENT:**

**PAUL LEWIS, Director, Standards Division**

**MICHELLE ARSENAULT, Advisory Committee  
Specialist, NOSB**

**LISA BRINES, National List Manager**

**SHANNON NALLY YANESSA, Assistant Director,  
Standards Division**

**MATT PAVONE, Policy Analyst, Standards Division**

**DEVON PATTILLO, Materials Specialist, Standards  
Division**

**BRIDGET McELROY, Policy Analyst, Standards  
Division**

C-O-N-T-E-N-T-S

Welcome

Paul Lewis . . . . . 4

Opening Remarks

Tom Chapman. . . . . 5

Member Roll Call

Michelle Arsenault . . . . . 8

Public Comments. . . . . .11

Closing Comments

Tom Chapman. . . . . 182

Adjourn. . . . . 183

1 P-R-O-C-E-E-D-I-N-G-S

2 (1:04 p.m.)

3 MR. LEWIS: Thank you, Michelle, and  
4 good afternoon. I am Paul Lewis, Director,  
5 Standards Division with the National Organic  
6 Program. And I want to welcome members of the  
7 Board and the public to today's meeting of the  
8 National Organic Standards Board Public Webinar.

9 This is our second webinar this week  
10 and to help us prepare our upcoming meeting with  
11 the Board scheduled for October 31st through  
12 November 2nd. And at that meeting, the National  
13 Organic program will also be providing updates on  
14 NOP activities.

15 Please consult the NOP website for  
16 further information about the face to face  
17 meeting that'll be occurring in Jacksonville next  
18 week.

19 Today's webinar, like other meetings  
20 of the National Organic Standards Board, operate  
21 under the Federal Advisory Committee Act. And I  
22 look forward to hearing the comments of the

1 public today to assist the NOSB in preparing  
2 their recommendations to USDA.

3 I also want to personally thank my  
4 Standards Division colleagues for their help  
5 behind the scenes to bring this to today's  
6 teleconference.

7 I'd like to now turn to Mr. Tom  
8 Chapman, Chairman of the National Organic  
9 Standards Board. Tom, thank you for chairing  
10 this webinar today.

11 MR. CHAPMAN: Thank you, Paul. And I  
12 would like to welcome everyone to the public  
13 comment webinar prior to our full meeting. This  
14 is our second session in --

15 MS. ARSENAULT: Tom, did we lose you?  
16 If you're still talking, we can't hear you.

17 (No audible response)

18 MS. ARSENAULT: Tom, are you there?

19 MR. CHAPMAN: Sorry, it looks like you  
20 guys muted me. Probably the issue.

21 MS. ARSENAULT: Thanks.

22 MR. CHAPMAN: So where did I cut off

1       there, Michelle?

2                   MS. ARSENAULT: Right at the  
3 beginning.

4                   MR. CHAPMAN: Right at the beginning.

5                   MS. ARSENAULT: Sorry about that.

6                   MR. CHAPMAN: Can I start from the top  
7 real quick? So welcome, everybody. Looking  
8 forward to a successful second webinar. Forgive  
9 us if we have any IT issues, like the one just  
10 experienced.

11                   And then most importantly, please  
12 remember to keep yourself on mute, Star 6 to  
13 mute, Star 7 to unmute. Or you can use your  
14 hand-set but don't put us on hold.

15                   So after the introductory comments,  
16 we'll begin the public comments in the order on  
17 the list. If someone's not present at the time  
18 they are called, we will skip them and come to  
19 them at the end of the comment period if they've  
20 arrived, if time permits.

21                   I will also call the following  
22 speakers, one or two ahead of time, and then if

1 they're on deck. If we can't find the phone  
2 number of a speaker, we'll ask members to message  
3 up to try to find them.

4 When called upon, commenters, you are  
5 asked to give your name and relevant affiliation  
6 for the record. We ask that you disclose all  
7 relevant affiliations pertaining to matters of  
8 business before the Board.

9 And I encourage NOSB members, if they  
10 want any further clarification, I encourage you  
11 to ask questions after the public commenter has  
12 finished their three minute time.

13 Comment time is three minutes per  
14 commenter. You'll hear the buzzer that Michelle  
15 practiced earlier. At that three minute mark,  
16 I'll ask for, out of respect for the Board and  
17 the other commenters on here, that you try to  
18 finish your sentence after hearing that buzzer.  
19 And then we'll open it up to questions from the  
20 Board at that time.

21 Again the format, we accept questions  
22 from the Board, but not from the general public.

1 After that, we'll move on to the next commenter  
2 and on down the list.

3 Now, there will be transcripts of this  
4 call bundled with the transcripts of the entire  
5 meeting. And with that, that's the end of my  
6 comments. So, Michelle, if you'd be so kind as  
7 to do a roll call of the Board present.

8 MS. ARSENAULT: Thanks, Tom. All  
9 right, Sue Baird, are you on the line with us?

10 MS. BAIRD: Yes, I am.

11 MS. ARSENAULT: Hello there. Harriet?

12 MS. BEHAR: Hi, there.

13 MS. ARSENAULT: I know you're here.

14 Asa, I know you're here too. Are you still with  
15 us? You're on mute if you're talking.

16 MR. CHAPMAN: I just unmuted Asa.

17 MS. ARSENAULT: Thanks.

18 MR. BRADMAN: All right, can you hear  
19 me now?

20 MS. ARSENAULT: Hey, Asa. Got you.

21 Great. Jesse, I see you up on the line. You  
22 there? Jesse, if you're talking, I can't hear

1       you.

2                       (No audible response)

3       MS. ARSENAULT:  No, still on mute,  
4       maybe?

5                       (No audible response)

6       MS. ARSENAULT:  Jesse, it looks like  
7       you're calling in from a phone, not a headset on  
8       your computer.  So I think you're still on mute.

9                       (No audible response)

10       MS. ARSENAULT:  I've got to skip over  
11       Jesse for now, but I see him on there.  Tom  
12       Chapman?

13       MR. CHAPMAN:  Present.

14       MS. ARSENAULT:  Lisa de Lima?

15       MS. DE LIMA:  Yes.

16       MS. ARSENAULT:  Great.  Steve Ela?

17       MR. ELA:  I'm here.

18       MS. ARSENAULT:  Excellent.  Dave  
19       Mortensen was not able to be with us today.  So  
20       Dave's not on the line.  Joelle Mosso?

21       MS. MOSSO:  Here.

22       MS. ARSENAULT:  Hi, Joelle.  Emily

1 Oakley?

2 MS. OAKLEY: Present.

3 MS. ARSENAULT: Thank you, ma'am.

4 Scott Rice?

5 MR. RICE: Present.

6 MS. ARSENAULT: Hey, Scott. A-Dae?

7 A-Dae was --

8 MS. ROMERO-BRIONES: I'm here.

9 MS. ARSENAULT: Thank you.

10 MS. ROMERO-BRIONES: I was just going  
11 to stop at A-Dae.

12 MS. ARSENAULT: Figured I'd better get  
13 your last name in there too. Dan Seitz?

14 MR. SEITZ: Here.

15 MS. ARSENAULT: Hi, Dan. Ashley

16 Swafar?

17 MS. SWAFFAR: I'm here.

18 MS. ARSENAULT: Hi, Ashley. And

19 Francis Thicke?

20 MR. THICKE: Here.

21 MS. ARSENAULT: All right. Everyone  
22 is here.

1 MR. BUIE: Jesse Buie.

2 MS. ARSENAULT: Oh, sorry.

3 MR. BUIE: This is Jesse. I'm here.

4 MS. ARSENAULT: Great.

5 MR. BUIE: I keep losing connection  
6 for some reason, but I'm here.

7 MS. ARSENAULT: Okay. Thanks, Jesse.  
8 Thank you, Tom, for moving back around.

9 MR. CHAPMAN: All right. So there's  
10 14, 15 Board members present. We do have a  
11 quorum, and we'll start with the comments now.  
12 Up first is Jennifer Davis, followed by Grant  
13 Richardson, and Chris Nagelhout. Jennifer, are  
14 you on the line with us?

15 (No audible response)

16 MS. ARSENAULT: So we haven't found  
17 Jennifer in the list. And I don't see anyone  
18 from that area code on the phone with us, Tom.

19 MR. CHAPMAN: All right. And Grant  
20 Richardson, are you here?

21 MR. RICHARDSON: I'm here, can you  
22 hear me?

1 MR. CHAPMAN: Yes, we can, Grant.  
2 Hold on one second, let me --- so after Grant we  
3 have Chris Nagelhout and then Marti Crouch.

4 All right, Grant, you can start with  
5 your name, and affiliation, and then just go into  
6 your comment.

7 MR. RICHARDSON: Great, thank you. My  
8 name is Grant Richardson. And I am the founder  
9 of Crisp Farms. Crisp Farms is a family farm in  
10 Smithville, Texas, which utilizes aquaponic  
11 farming to provide our community a year-round  
12 local supply of lettuces and leafy greens that  
13 adhere to the organic standards, an offer that is  
14 not currently available in our community due to  
15 our climate.

16 I'm a 25-year old first generation  
17 farmer. I have a master's degree in  
18 environmental engineering, but I quit my career  
19 in water treatment engineering to help launch  
20 this aquaponic farm, since I'm so passionate  
21 about this farming technique to provide a more  
22 sustainable and productive form of agriculture

1 that fully meets the organic standards.

2 There are several key points that I  
3 would like to share today that undoubtedly  
4 demonstrate the proposal to ban aquaponics from  
5 the NOP as both unreasonable and unfounded.

6 First and foremost, aquaponics is not  
7 hydroponics. On the August webinar, multiple  
8 Board members, in supporting this recommendation,  
9 were quoted as suggesting that aquaponics is  
10 really just hydroponics.

11 The proposal document ascertains that,  
12 and I quote, "Hydroponic production is highly  
13 dependent on the continuous use of fertilizer  
14 inputs to the production system rather than  
15 relying on productive soil and the natural  
16 recycling of nutrients through decaying organic  
17 matter to regenerate the fertility needs of the  
18 crops."

19 While this assessment may be accurate  
20 for conventional hydroponics, it is not accurate  
21 for aquaponics. In fact, this assessment is one  
22 of the fundamental reasons why aquaponics is not

1 hydroponics. This is because aquaponics does not  
2 and cannot use fertilizer inputs like hydroponics  
3 does because of the effect it would have on fish  
4 waste.

5 Furthermore, aquaponics farming  
6 functions in direct alignment with what the  
7 previous standards defined organic flora farming  
8 as organic. Contrary to what is stated in the  
9 proposal, aquaponics does use the natural  
10 recycling of nutrients through decaying organic  
11 matter to regenerate the fertility needs of the  
12 crops.

13 It does this through the natural and  
14 biological transformation of fish waste into  
15 beneficial nutrients for the crops. And these  
16 conjectures are being used as the justification  
17 to ban hydroponic practices? But it is not  
18 acceptable to group aquaponics under the umbrella  
19 of hydroponic growing practices because of the  
20 aforementioned differences.

21 Furthermore, at the first meeting of  
22 the hydroponic/aquaponic task force in January of

1 2016, the NOP stated that the NOP would likely  
2 need to undertake rulemaking on aquaponic farming  
3 and that, and I quote, "Rulemaking requires a  
4 comprehensive recommendation from the NOSB that  
5 addresses grey areas left by past  
6 recommendations."

7 One of the grey areas that are  
8 specifically called out was that aquaponic  
9 systems were not sufficiently addressed including  
10 NOSB recommendations. The recommendation brought  
11 forth in Jacksonville does not address the gray  
12 area for organic aquaponics, as the NOSB has been  
13 specifically tasked with doing.

14 Instead, the recommendation to ban  
15 aquaponics relies on misinformation and the lack  
16 of scientific due diligence in and attempt to  
17 lump aquaponics under the umbrella of hydroponics  
18 which as I previously articulated, it clearly is  
19 not. Thank you.

20 MR. CHAPMAN: Thank you. Any  
21 questions from the Board for Grant?

22 (No audible response)

1                   MR. CHAPMAN: Grant, I'm not seeing  
2 any questions. Thank you for your comment. Up  
3 next we have Chris Nagelhout. Chris, are you  
4 here?

5                   MR. NAGELHOUT: Yes, I'm here. Can  
6 you all hear me?

7                   MR. CHAPMAN: Yes, we can, Chris.  
8 Hold on one moment. And after Chris, we had  
9 Marti Crouch and then Clarence Wagner. Chris,  
10 you can start with your name and relevant  
11 affiliation.

12                  MR. NAGELHOUT: Sure. I'm Chris  
13 Nagelhout. And I'm the co-founder of Crisp  
14 Farms. As my colleague, Grant, just mentioned,  
15 we are a new aquaponic farm pending organic  
16 certification. And we grow lettuce and leafy  
17 greens.

18                   Our method of organic farming uses  
19 one-tenth of the land, and 90 percent less water  
20 than soil-grown produce, and with the added  
21 benefit that we don't have any nutrient encroach  
22 into our system.

1 I don't know if you know this, but  
2 from November to March, 90 percent of the lettuce  
3 we will eat in the US and Canada will come from  
4 the Yuma Valley in Arizona. It brings trucks  
5 thousands of miles to consumers.

6 Crisp Farms lettuce, which is grown  
7 within 30 miles of Austin, is clearly more  
8 sustainable than the alternative products grown  
9 in drought-stricken areas and sucking the  
10 Colorado River dry.

11 Additionally, we don't use any  
12 petroleum-powered tractors. Our employees enjoy  
13 very comfortable working conditions, and our  
14 product, since it is contained in a fully  
15 biosecured greenhouse, never comes in contact  
16 with overspray from non-organic farms or  
17 pathogens from wild animals.

18 There has been much conjecture amongst  
19 the Board about our product being grown in fish  
20 waste. First of all, our product is not grown in  
21 fish waste. Because by the time it reaches our  
22 plant, it is broken down by natural biological

1 practices such as you would find in rivers,  
2 streams, and wetlands.

3           However, how would this activation be  
4 any different than organic farms who irrigate  
5 with water from natural bodies of water which  
6 undoubtedly contain aquatic life? What about  
7 organic rice farming where thousands of acres are  
8 flooded with river water, or how organic farmers  
9 use worm castings for fertilizer? And worms are  
10 a cold-blooded animal just like fish.

11           The proposal does not provide any  
12 justification to suggest that aquaponics poses  
13 more risk than those other NOP accepted  
14 practices.

15           I'd also like to highlight the fact  
16 that this recommendation has demonstrated to be  
17 against the consumer interests. There were 198  
18 comments submitted to the Federal Register that  
19 this meeting would contain the search word  
20 "aquaponic." Of those comments, 167 of them were  
21 in support of organic aquaponics.

22           At least 84 percent of the public who

1 feels strongly enough about aquaponics farming to  
2 comment about this recommendation want aquaponics  
3 to remain organic, 84 percent. Clearly a vote to  
4 ban aquaponics from the NOP is in direct conflict  
5 with consumer interest.

6 Additionally, our world is rapidly  
7 growing, climate change is occurring, and arable  
8 land is not increasing. These are facts. If  
9 we're to take healthy, sustainable, and organic  
10 food into the future to feed not just the few who  
11 can afford but make it more affordable for all,  
12 then we need to be advocates for agriculture  
13 innovation and not be afraid of it.

14 If the organic labels can only be  
15 applied to soil-grown, then the label and its  
16 trust will eventually die. We are already  
17 meeting the organic standards of our growing  
18 methods, and we aren't asking for any special  
19 favors.

20 Lastly, I'll remind you that you are  
21 voting on aquaponics as a separate recommendation  
22 from hydroponics. Please consider how the

1 information you've learned about aquaponics  
2 differentiates it from hydroponics.

3 Transcripts from previous discussions  
4 have indicated confusion regarding the difference  
5 between hydro and aqua. It would be  
6 inappropriate to base one's understanding and  
7 vote on aquaponics based off of a muddled  
8 understanding of our industry and methods.

9 We are a distinct and separate method  
10 of organic agriculture with hydroponics, and we  
11 should be considered as such. Thank you for your  
12 time.

13 MR. CHAPMAN: Thank you. I have some  
14 questions from the Board, first Steve and then  
15 Emily. Steve?

16 MR. ELA: Yes, for both of you, I have  
17 a couple of questions. I mean, you both stated  
18 you can't use fertilizer, there are no nutrient  
19 inputs. But yet you are, I presume, feeding the  
20 fish which, I mean, has been what is being  
21 transformed into a nutrient. So I guess I'd like  
22 you to comment both on that nutrient input and

1 then also whether you're adding any  
2 micronutrients.

3 And then finally I am, I guess, would  
4 like you to at least give a little bit more --- I  
5 get that the fertilizer's coming from the fish,  
6 but the plants themselves are still growing in  
7 the hydroponic media, even though the fertilizer  
8 source is the fish.

9 So I'm not quite clear on how you can  
10 say that's not a hydroponic plant growing system,  
11 even though the aquaponic system, I get, as a  
12 whole is bigger.

13 MR. NAGELHOUT: Absolutely. So our  
14 claim that we're not putting any inputs into our  
15 system to fertilize our plants, I still stand by  
16 that claim. And I know we are putting a fish  
17 food in. It's a non-GMO fish food for our fish.

18 However, our fish waste, basically  
19 manure in this case, but when you're putting  
20 manure on soil fields for organic grown, it isn't  
21 required that those cows, or turkeys, or chickens  
22 were fed an organic diet.

1                   It doesn't really break down that way  
2                   in the water. Our fish food isn't left to  
3                   decompose in the water. It's fully consumed by  
4                   the fish. So I hope that answers your question  
5                   there.

6                   Also, within our system there are no  
7                   micronutrients that we put in. There aren't any  
8                   other synthetic fertilizers or, well, any NOP  
9                   allowed fertilizers. So the only other input we  
10                  do have in our system is crushed oyster shell  
11                  which just maintains a buffer for pH. And it's  
12                  just a natural product.

13                  All of the micronutrients in our  
14                  system are nutrients that our plants do require,  
15                  are produced in the water column. It's a natural  
16                  biology nitrification, all the other beneficial  
17                  bacteria that are located in our entire system.

18                  And if you think about, like, a  
19                  wetland, or streams, or rivers, it functions  
20                  exactly the same way that those natural  
21                  byproducts from the aquatic organisms that live  
22                  in the water are broken down. So does that

1 answer your question right there about the inputs  
2 into our systems?

3 MR. ELA: Yes, that's good.

4 MR. NAGELHOUT: Okay. And, I'm sorry,  
5 would you --- I think you had two questions.  
6 Would you remind me what the second one was?

7 MR. ELA: It was just that I am still  
8 --- I get that the whole aquaponic system is a  
9 larger system. But for the plants themselves,  
10 I'm not totally clear of why it still seems like  
11 that's a hydroponic system at that point.

12 MR. NAGELHOUT: Sure. So the way  
13 we're viewing that, and the way I think it ought  
14 to be interpreted is, yes, we are, we're using  
15 ideas from aquaculture. And we are using ideas  
16 from hydroponics.

17 But just because we use --- in our  
18 system we use a deepwater culture --- just  
19 because it looks like other hydroponic systems,  
20 it doesn't function the same way.

21 So I don't like to think of aquaponics  
22 as being grouped under hydroponics just because

1 of the lack of input into our systems, the  
2 natural biology that's alive and constantly  
3 refreshing itself within our system.

4 We don't have to drain any of our  
5 water. And it's just --- it's a different  
6 makeup. It's kind of like putting, you know, the  
7 first cars that were invented and they contained  
8 a buggy. And you then feel like saying, well,  
9 how is this not a carriage. And they're just two  
10 separate technologies that can look similar, and  
11 be designed similarly, but don't actually  
12 function that way.

13 MR. CHAPMAN: Thank you. Emily?

14 MS. OAKLEY: Thank you. Could you  
15 please explain the number of days or the time  
16 interval between when the water comes in contact  
17 with the fish and when it comes in contact with  
18 the plant root? Thank you.

19 MR. NAGELHOUT: Yes. So our system is  
20 a recirculating system. There isn't a number of  
21 days interval that I could quote you. I mean, it  
22 is a system that is constantly recirculating.

1                   However, the way that our system  
2 functions is that after the fish tank we have a  
3 clarifier which has a baffle system. That's a  
4 very low water flow pressure, very large flow  
5 down the solids.

6                   So in that clarifier, that's where the  
7 fish food solids settle. And then we pump those  
8 out. They would just --- we pull a gate valve,  
9 and it drains very quickly. We use that with our  
10 composting from our trimmings from our lettuce  
11 and the coir substrate that we use. And we use  
12 that to apply to the land.

13                   So there's not a time difference  
14 between the two, like, we don't hold the fish  
15 water in a certain system and then let it go a  
16 number of days before it's introduced to our  
17 lettuce crop.

18                   MS. OAKLEY: Thank you.

19                   MR. CHAPMAN: Thank you very much.

20 We'll be moving on to the next commenter. Thank  
21 you, Chris. Next I have Marti Crouch, followed  
22 by Clarence Wagner, and then Wil Hemker. Marti

1 Crouch, are you on the line?

2 MS. CROUCH: Yes.

3 MR. CHAPMAN: And if you can start  
4 with your name and relevant affiliation.

5 MS. CROUCH: Yes, my name is Marti  
6 Crouch, and I'm presenting comments for the  
7 Center for Food Safety. I consult on technical  
8 issues including the one I'll be talking about.  
9 And these were comments that were submitted, part  
10 of comments submitted by the Center for Food  
11 Safety on October 11th. And those include  
12 footnotes.

13 This is for the Material Subcommittee  
14 and specifically on the proposal for additional  
15 excluded methods to be listed in the National  
16 Organic Program Excluded Methods guidance  
17 document.

18 The Center for Food Safety supports  
19 the addition of cisgenesis, intragenesis, and  
20 agroinfiltration to the list of excluded methods  
21 but cautions NOSB to moving forward at this time  
22 without clear definitions of the three methods

1 provided in the proposal.

2 In these, as well as past comments,  
3 CFS has provided ample language for the Board to  
4 develop clear definitions of the three methods as  
5 well as several other methods that remain to be  
6 determined in the terminology chart.

7 Whether genes are moved or manipulated  
8 between species or within species, altered  
9 techniques, cisgenesis, intragenesis, and  
10 agroinfiltration, took the definition of genetic  
11 engineering under definitions and principles in  
12 criteria.

13 We also recommend the use of  
14 transposons, which are still listed as TBD in the  
15 terminology chart, be clearly defined, or the  
16 method, and categorized as excluded.

17 Now in more detail, and I will talk  
18 about cisgenesis, and then Jaydee Hanson from CFS  
19 will talk later in the afternoon about the other  
20 methods.

21 According to a study cited in CFS  
22 comments, "Cisgenesis refers to the genetic

1 modification of the recipient plant, the natural  
2 gene from a sexually compatible plant. Such a  
3 gene includes its introns and is flanked by its  
4 native promoter and terminator in the normal  
5 sense orientation."

6 In cisgenesis then, a biotechnologist  
7 uses genetic engineering techniques to move one  
8 or a few genes between species and lines and  
9 which results in many of the same concerns as  
10 transgenesis.

11 We are aware that some people worry  
12 that excluding cisgenesis will limit some kinds  
13 of Brassica breeding that are used to produce new  
14 vegetable varieties. Because in addition to  
15 sexual crossing, Brassica breeders sometimes use  
16 cell fusion within the plant family, in this  
17 case, it would be grass casein, to introduce  
18 nitrate-stimulated species.

19 However, cell fusion involves mixing  
20 together of all the cell contents, including  
21 entire genomes of the varieties being fused  
22 without previous invitro manipulation of specific

1 nucleic acids.

2 The 2013 NOP memo allowed cell fusion  
3 within the plant family, because for decades many  
4 Brassica crops had been developed using this  
5 method. So it's considered conventional breeding  
6 rather than genetic engineering. That's also why  
7 the Codex definition does this.

8 So listing cisgenesis has no impact on  
9 whether cell fusion within the same family was  
10 considered an excluded method. Thank you.

11 MR. CHAPMAN: Thank you, Marti. Any  
12 questions from the Board?

13 (No audible response)

14 MR. CHAPMAN: I'm not seeing any  
15 questions. Thank you very much for your  
16 comments.

17 MS. CROUCH: Yes, great. Thank you.

18 MR. CHAPMAN: And our next commenter  
19 is Clarence Wagner, followed by Wil Hemker, and  
20 then Ashley Buhler after that. Clarence, are you  
21 here?

22 MR. WAGNER: Yes, can you hear me?

1                   MR. CHAPMAN: Yes, I can. Can you  
2 please start with your name and relevant  
3 affiliation?

4                   MR. WAGNER: Yes, my name is Clarence  
5 Wagner, CEA Fresh Farms.

6                   Since 1995 and until today, the NOSB  
7 has recommended and included organic hydroponic  
8 farming on the approved list of organic farming  
9 methods to be certified and receive the USDA  
10 organic seal.

11                   During these many years, organic  
12 hydroponic farmers, in compliance with the  
13 guidance and inspections of USDA certifying  
14 bodies, have built and populated facilities  
15 across the country.

16                   In the late 2014 Organic Integrity  
17 Quarterly, the NOP stated, "Organic hydroponics  
18 is a method of growing plants using mineral-  
19 nutrient solutions in water without soil.  
20 Terrestrial plants may be growing with their  
21 roots in the mineral-nutrient solution only or in  
22 an inert medium."

1                   In the future, the NOP may provide  
2 additional guidance regarding organic hydroponic  
3 direction and how the regulations apply to such  
4 methods.

5                   At the NOSB webinar meeting on August  
6 14th, in the discussions about organic  
7 hydroponics, Miles McEvoy stated of these  
8 systems. There have been no accounts of organic  
9 operations that are not done in soil that are  
10 certified organic under the EU standards.

11                   In the US, the European Union organic  
12 equivalency arrangement has no restrictions in  
13 terms of hydroponics. So there is no critical  
14 variance or differences there.

15                   One of the edicts about the US organic  
16 regulation is that it provides a lot of  
17 flexibility in operation to develop systems that  
18 are and can be compliant with the regulations.

19                   Nevertheless, the Crops Subcommittee  
20 compact performance and containment growing  
21 recommendations that are being presented to the  
22 Board for a vote during this session is a

1 recommendation to prohibit aeroponic, aquaponic,  
2 and hydroponic growing methods and continued  
3 certification as USDA organic.

4           These recommendations completely  
5 nullify the desire of the NOP for further  
6 guidance towards organic hydroponic acceptance  
7 and reverses the 22-year history of hydroponics  
8 being included in the family of USDA Organic  
9 Growers.

10           These recommendations being presented,  
11 if passed, shuts the door in the face of  
12 thousands of organic hydroponic and aquaponic  
13 farmers, many of whom may lose their businesses,  
14 and ignores our country's need for more organic  
15 produce, not less, in the face of climate change,  
16 a growing population, and the need for new  
17 innovative techniques for organic farming.

18           It is not a step forward but a step  
19 backward to determine that technology needs is  
20 more possible for compliance. I could stand here  
21 and quote on all of the advantages of hydroponic  
22 systems all day. And I have already spoken to

1 the well documented minority view of the  
2 Committee which encompasses the many virtues of  
3 organic hydroponic farming.

4 I also recommend the well written CCOF  
5 proposal submitted for consideration with the  
6 compromise that includes everyone in the organic  
7 family and supports USDA regulations that are  
8 inclusive and not expensive, as soil and water  
9 organic systems have their advantages and  
10 limitations.

11 Therefore, I urge the full Board not  
12 to pass this proposal as it stands but to send it  
13 back to the Crops Committee to find a way to keep  
14 organic hydroponics in the family of organic  
15 methods, with positive guidance from past  
16 recommendations, not banishment. Thank you.

17 MR. CHAPMAN: Thank you. I have a  
18 question from Emily.

19 MS. OAKLEY: Thank you. I thought I  
20 heard you reference thousands of certified  
21 organic hydroponic, aeroponic, and container-  
22 based systems. Did I hear that correctly?

1 MR. WAGNER: I said thousands of  
2 people working with these systems --

3 MS. OAKLEY: Oh --

4 MR. WAGNER: -- 126 employees. So if  
5 you put together the people who work in all of  
6 these systems, not just the systems themselves,  
7 yes, that encompasses thousands.

8 MS. OAKLEY: Okay, thank you. I just  
9 didn't hear that clearly. I appreciate the  
10 characterization.

11 MR. WAGNER: No problem, thank you.  
12 Okay.

13 MR. CHAPMAN: Thank you. Any other  
14 questions from the Board --

15 PARTICIPANT: Hello?

16 MR. CHAPMAN: -- at this time? Sorry,  
17 can you hear me?

18 MS. BEHAR: Yes, hi. I'm wondering,  
19 in the marketplace, with all of the benefits that  
20 you say hydroponic has, why is the organic label  
21 so important to you? Why would not the  
22 hydroponic label, if it was promoted the way you

1 are promoting it here, not bring customers as a  
2 premium that you need?

3 MR. WAGNER: The organic label is  
4 already accepted by the population and the Board  
5 as something that is clean, something that does  
6 not have pesticides, and herbicides, and  
7 chemicals, and other, you know, hazardous  
8 materials that we all know about.

9 We need organic certified in quotes.  
10 Everything that we use is organic or it should be  
11 organic. And also the flexibility of the  
12 aquaponic in the USDA regulations, as they  
13 interpret it today, do allow for this, to expand  
14 the organic market, to expand the opportunity for  
15 Americans to get really clean food.

16 We heard from others across America  
17 yesterday saying this very same thing. Before  
18 labeling, a change needs to be made to describe  
19 whether it's organic soil or that it's  
20 hydroponic. That's fine, but it needs to be in  
21 the same family, because we have the same  
22 methods, except for the soil seems to be the

1 major issue, not other issues regarding the  
2 regulations.

3 MR. CHAPMAN: Thank you, Clarence. I  
4 don't know if there are any other questions at  
5 this time. So we'll move to our next speaker,  
6 Wil Hemker. Following that, we have Ashley  
7 Buhler and Yemi Amu. Are they already on the  
8 line?

9 MR. HEMKER: Yes, I am, Chairman. And  
10 I have four slides. Do you have them on your  
11 screen?

12 MR. CHAPMAN: Michelle? Have you got  
13 the slides?

14 MS. ARSENAULT: They are up on my  
15 screen. Do you guys see them yet?

16 MR. CHAPMAN: And, Wil, if you could  
17 start with your name and relevant affiliations?

18 MR. HEMKER: Yes, thank you. My name  
19 is Wil Hemker. I'm with the University of Akron  
20 Research Foundation. Slide 1 ---

21 MS. ARSENAULT: Sorry, Tom, can you  
22 see the slides?

1 MR. CHAPMAN: Yes, we can see the  
2 slides.

3 MS. ARSENAULT: Okay, great. Thanks.

4 MR. CHAPMAN: Wil, go ahead.

5 MR. HEMKER: Thank you. This Board,  
6 and the NOP, and myself hold the organic  
7 standards so that consumers can trust the label,  
8 and Mother Earth can be more resilient.

9 The Crop Subcommittee proposal on  
10 hydroponics and container growing recommendations  
11 from August 29th of this year were not authored  
12 on using sound science and up to date resilient  
13 ecological production facts, nor did they address  
14 organic food crops in today's marketplace which  
15 have unsafe exposure levels of some components.

16 Like the CCOF written comments, the  
17 largest certifier of organic farms, I agree with  
18 their concerns for terms used in that report that  
19 say inert or trophic levels for hydroponic  
20 cultivation. These reveal a degree of ignorance  
21 to the salient scientific literature.

22 Slide 2 please. The soil is teeming

1 with life, since life is enabled by water. And  
2 aqueous flow of critical elements and the  
3 microbiome through this root zone allows plants  
4 to thrive. Soil, or soilless, water is the  
5 medium. Therefore diversity should be discussed  
6 about more than simply soil. But root-zone  
7 ecosystems is critical.

8 Slide 3. In 1990, the NASA-controlled  
9 Ecological Life-support System program  
10 investigated hydroponic production. They  
11 demonstrated in their model crop that, grown in  
12 soil, the rhizome microbiome was teeming with  
13 life, and in soilless as well. Levels to 100  
14 billion cells per gram were found in either  
15 system.

16 Therefore, both soil and hydroponic  
17 growing displayed plentiful root-zone microbiome.  
18 Robust plant life defines the level of aquatic  
19 trophic activity.

20 Slide 4 please? Addressing nitrate  
21 concentrations in leafy greens, organic field  
22 grown versus hydroponic standards, and a new

1 method called nitrate reduction methods in  
2 hydroponics, Cornell's Agriculture and Life  
3 Sciences lab measured, in soil fields, organics  
4 similar or higher than conventional hydroponics.

5 And the new technique, hydroponics  
6 nitrate reduction methods, found ten to 100 times  
7 less nitrates in that production versus organic  
8 field production. The table speaks for itself.

9 Also, provided to this Board in April  
10 of 2017, heavy metal analysis of USDA organic  
11 certified field grown versus greenhouse  
12 hydroponic grown spinach has found 60 times more  
13 cadmium in field grown than hydroponics. The  
14 level of cadmium at that level exceeds EPA  
15 drinking standards by ten times.

16 USDA certified organics needs to be  
17 rooted in strong science and good agricultural  
18 practices, safe products are needed for our  
19 consumers. Thank you.

20 MR. CHAPMAN: Thank you, Wil. Any  
21 questions for Wil? I see Francis.

22 MR. THICKE: Hi, thank you, Wil. You

1 showed a slide on the number of microbes in  
2 hydroponics. But compared to soil growing, what  
3 about the diversity? What is the comparison of  
4 the diversity of different microbes in soil  
5 versus hydroponics? And do you have data on  
6 that?

7 MR. HEMKER: Not at my hand right now.  
8 I could go back to the literature and find out  
9 how it was done on the diversity. Can you  
10 provide me your benchmark for diversity in soils  
11 that you use?

12 MR. THICKE: I'm interested in the  
13 comparison of hydroponic versus soil-grown. What  
14 is it? I've seen some studies that are showing  
15 differences in organic versus conventional in  
16 soil-grown. But I've looked, and I've not really  
17 seen any data to compare the diversity of  
18 microbes in hydroponics versus so and so.

19 MR. HEMKER: What impact would that  
20 make on the vitality of the plant crop? Can you  
21 tell me that?

22 MR. THICKE: It indicates a whole

1 different ecology. And as a cell scientist, I  
2 know that we don't really understand all the  
3 implications of ecology in soil. But just seeing  
4 differences gives us something to ponder about  
5 that.

6 I mean, really, can we really match  
7 that in the hydroponic system? And are those  
8 differences important? We need to have those  
9 answers.

10 MR. HEMKER: Those are questions yet  
11 to be defined, I'm certain. I'm not a soil  
12 scientist. But I know this, that a microbiome  
13 plays a very important route in our own human  
14 health.

15 And I'm a food scientist. And, you  
16 know, they're working with new growers right now  
17 in this area. So I think that's a valid  
18 question. But I think, before we try to parse  
19 the difference between soil versus soilless, we  
20 better look at that microbiome and what's going  
21 on in that trophic medium.

22 MR. THICKE: Thank you.

1 MR. HEMKER: Thank you.

2 MR. CHAPMAN: Thank you, any other  
3 questions from the Board?

4 (No audible response)

5 MR. CHAPMAN: Not seeing any  
6 questions, Wil, thank you for your comments.

7 MR. HEMKER: Thank you for the  
8 opportunity.

9 MR. CHAPMAN: Up next I have Ashley  
10 Buhler, followed by Yemi Amu, and Michael  
11 McDonald. Ashley, are you here with us?

12 MS. BUHLER: I am. Can you hear me?

13 MR. CHAPMAN: Yes, we can. Ashley, if  
14 you can start with your name and relevant  
15 affiliation.

16 MS. BUHLER: My name is Ashley Buhler.  
17 I am the Animal Well-Being and Ethics Manager for  
18 Miller Poultry.

19 MR. CHAPMAN: Great. And just go  
20 ahead with your comment.

21 MS. BUHLER: Thank you. I first  
22 wanted to thank the Board for the opportunity to

1 do so today. The first topic I would like to  
2 address is chlorine dioxide. I would urge the  
3 Board to keep that on the list of approved  
4 materials.

5 In our organic production, we found  
6 that that's the best option for the sanitation  
7 for our bird health. We've looked at other  
8 sanitizers within organic approved, and our non-  
9 organic birds, and have found that chlorine  
10 dioxide is the best method for sanitation.

11 The second point I wanted to address  
12 is the research on the thiamine. The Board has  
13 asked for research to be done and some  
14 information on where the research could lead.

15 I wanted to address the fish meal and  
16 animal byproducts portion of that. The current  
17 standard in the organic program, 205.237, state  
18 that currently feed, a million of poultry  
19 slaughter byproducts cannot be given to mammals  
20 or poultry.

21 So if there is research to be done, it  
22 would have to be done outside of organic

1 production, or that regulation would need to be  
2 changed in order to do the regulation. And then  
3 it would need to go through the FDA in order to  
4 get that approval.

5 And also, a current regulation for the  
6 GAP certification in certified humane do not  
7 allow for fish meal and avian byproducts to be  
8 used in the feed. So any research would need to  
9 be done in birds that do not have those  
10 certifications in order for that to happen.

11 New products that would be used to  
12 replace the thiamine would also need to balance  
13 the amino acid profile in the seed. And that can  
14 create a challenge for balancing rations. If the  
15 new material is high in the thiamine it can also  
16 be high in some other amino acids which may  
17 create that challenge.

18 The new products could also not be as  
19 digestible to the birds, and that could create  
20 some loss in feed conversion and also excess  
21 waste to the environment. If the birds are not  
22 able to process all that they're eating, that

1 could create a problem in the grading of those  
2 birds outside.

3 Currently, there is not much research  
4 that has been done with fast growing and full  
5 growing broilers as to how much thiamine they  
6 each need. But according to our nutritionist,  
7 the thiamine will still be important.

8 And the ratio will probably be similar  
9 in fast growing and slow growing. So even if we  
10 switch to a slow growing broiler, you would  
11 probably still need the same amount of the  
12 thiamine.

13 To address the flock management  
14 practices --- Thank you very much.

15 MR. CHAPMAN: Thank you. Any  
16 questions from the Board?

17 (No audible response)

18 MR. CHAPMAN: I don't see any  
19 questions from the Board. Thank you for your  
20 comments.

21 MS. BUHLER: Thank you.

22 MR. CHAPMAN: Up next we have Yemi

1 Amu. Yemi, are you on the line?

2 (No audible response)

3 MR. CHAPMAN: Yemi, we have not been  
4 able to find you. Going once, going twice,  
5 moving on. Mike McDonald, are you on the line?

6 MR. MCDONALD: Yes, I'm here.

7 MR. CHAPMAN: Okay, Michael. Hold on  
8 one second. After Michael is Dana Perls followed  
9 by Mani Skaria.

10 Michael, if you can start with your  
11 name, and relevant affiliation, and then go into  
12 your comments.

13 MR. MCDONALD: My name is Michael  
14 McDonald with H2O Produce. I'm the CEO and  
15 president of our company. And I will be speaking  
16 on behalf of aquaponics, hydroponics, aeroponics  
17 as a whole.

18 Up front, my apologies, I am offsite.  
19 I'm not on a computer. So I'm a little short-  
20 lived today, but I have all my presentation  
21 available.

22 Outright, over the past day and a

1 half, and past few months, I've had nothing but  
2 disagreement from soil-based farmers, partly  
3 aquaponics, hydroponics, aeroponics, with little  
4 to no support of why traditional farming is  
5 better aside from an article of the quality  
6 without full study of the people in the study to  
7 further understand other potential health  
8 problems.

9 Specifically, in the individual's or  
10 the body's lack of ability to absorb nitrates.  
11 I'm speaking very specifically of an article that  
12 was brought up on Tuesday.

13 The American Journal of Clinical  
14 Nutrition back in 2009 specifically states  
15 evidence of adverse effect of nitrate is  
16 inconsistent and that nitrate may actually be  
17 beneficial.

18 There is some evidence that nitrate  
19 reduces blood pressure. The blood pressure  
20 lowering effect of vegetables and the vast  
21 dietary approaches to stop hypertension trials  
22 reduced the nitrate in these vegetables that were

1 actually studied.

2 Another article specifically states  
3 nitrates are so essential in the fact that our  
4 bodies even create it on their own. For every  
5 kilogram of our body weight we carry, your body  
6 naturally produces about one milligram of  
7 nitrate. This is specifically out of Jeff  
8 Snyder, PhD, Associate Professor at the  
9 University of Wisconsin-Madison, Department of  
10 Animal Sciences.

11 Our production may very well be what  
12 these studies and an overall ushering in new ways  
13 of thinking. We, the aquaponic, hydroponic, and  
14 aeroponic farmers endorsed the USDA certified  
15 organic label struggle in helping them understand  
16 what we do.

17 Saying to them that we are farmers and  
18 have a higher year-round yield with less of a  
19 cost associated with traditional farming,  
20 decreased growth cycles, and we do not have to  
21 wield the problems than traditional farmers do.

22 Our society is conditioned to believe

1 that organic farming is pesticide free and has  
2 little to low chemicals associated to food they  
3 are consuming.

4 In traditional large farming  
5 operations, it is completely understood that  
6 certain measures have to be taken to protect  
7 crops. However, container-based growing has  
8 proven over the years to be more sustainable and  
9 even more so now to be more cost effective.

10 The association that my company, H2O  
11 Produce, has with the USDA certified organic  
12 label assures my farmers that this is not yet  
13 complete. Upon concluding, we at H2O Produce ---

14 MR. CHAPMAN: I'm going to have to cut  
15 you off there. But thank you for your comments.  
16 Any questions from the Board?

17 (No audible response)

18 MR. CHAPMAN: I'm not seeing any  
19 questions. Michael, thank you very much for your  
20 comments. We will proceed onto our next  
21 commenter. Is Dana Perls here? Sorry, is Dana  
22 Perls here? Did I hear that?

1 MS. ARSENAULT: I'm not seeing Dana on  
2 the line, Tom. And I just sent out an email, a  
3 chat that we were on, and she hasn't answered.  
4 So she may not be on yet.

5 MR. CHAPMAN: Okay. Mani Skaria, are  
6 you here?

7 MR. SKARIA: Yes. Can you hear me?

8 MR. CHAPMAN: Yes, I can. Hold on one  
9 moment. On deck after Mani will be Shannon  
10 Sbarra and Roberto Ramirez.

11 Mani, if you can start with your name,  
12 affiliation, and then proceed with your comments.

13 MR. SKARIA: Yes, sir. My name is  
14 Mani Skaria. I am the president and the CEO of  
15 US Citrus, specializing in first line production.  
16 And I'm also a plant pathologist and a citrus  
17 specialist with 30 years mostly with the Texas  
18 A&M University.

19 For your respected members, we think  
20 the national problem in agriculture, how can it  
21 be that the United States, as the world economic  
22 leader, continues to rely on imports to supply

1 organically grown products to our consumers?

2           The heart of the problem is that  
3 organic food production is not just economically  
4 viable in the United States. Why invest in  
5 growing if it will be a losing proposition from  
6 the beginning?

7           Citrus particularly faces two  
8 additional challenges with decreased has driven  
9 the cost of production in the United States since  
10 2005.

11           There is the third largest citrus  
12 production area in the United States. There are  
13 three real examples of individuals who basically  
14 could not overcome these challenges.

15           I know an 86-year old citrus grower  
16 with 64 years of experience in citrus. They are  
17 citrus production because of fees, higher  
18 productions cost.

19           Number two, a middle-aged organic  
20 citrus grower and a past president of Texas  
21 Citrus Mutual will have organic land production  
22 because of their own reasons.

1                   Number three, a citrus scientist with  
2                   four decades of citrus experience, and with two  
3                   decades of citrus farming experience, because of  
4                   the same reasons, cannot ask for 100-person  
5                   organic farming of citrus production on a larger  
6                   scale.

7                   There's an unfair international market  
8                   put them in the United States where supplies are  
9                   cheaper with their lower manual labor cost? We  
10                  will not be able to compete with that cost  
11                  factor. Ours will have to quality products grown  
12                  here on domestic soil using high pesticide-free  
13                  standards.

14                  Respected members, I ask you study and  
15                  propose ways to support the production and  
16                  distribution of pesticide-free citrus grown in  
17                  the United States.

18                  I'm available to assist in any way  
19                  that I can to define the problem, define the  
20                  issues, and identify experts. Now more than ever,  
21                  we must be comfortable to help US agriculture,  
22                  especially citrus.

1                   Thank you. And I have provided a  
2 medium and an audio with a lot of information.  
3 Thank you very much.

4                   MR. CHAPMAN: Thank you. Any  
5 questions from the Board?

6                   (No audible response)

7                   MR. CHAPMAN: I'm not seeing any  
8 questions. Thank you very much for your  
9 comments.

10                  MR. SKARIA: Thank you.

11                  MR. CHAPMAN: Up next, Shannon Sabara.  
12 Shannon, are you here?

13                  MS. SABARA: I am here.

14                  MR. CHAPMAN: Excellent.

15                  MS. SABARA: Can you hear me?

16                  MR. CHAPMAN: Yes, we can, Shannon.  
17 Hold on one second.

18                  After Shannon, Roberto Ramirez. We  
19 haven't found Roberto. If you're on the line,  
20 please message Michelle. And after Roberto is  
21 Robin Seeley.

22                  Shannon, if you can, start with your

1 name, relevant affiliation, and then proceed into  
2 your comments.

3 MS. SABARA: My name is Shannon Sbara.  
4 I'm an aquaponic farmer for the past five years.  
5 I am strongly for allowing aquaponic farms to be  
6 organically certified.

7 In addition to the multitude of other  
8 reasons that have already been stated during this  
9 hearing, I have just one essential point of  
10 clarification. Our nutrients, whether in soil,  
11 in a hydroponic system, or in an aquaponic  
12 system, ultimately enter the root zones in a  
13 liquid form.

14 In other words, the fungi and bacteria  
15 that facilitate the interchange of nutrients  
16 transfer those molecules in an aqueous form.  
17 I'll say it again. Water, not soil, is the  
18 delivery mechanism for nutrients. Bacteria and  
19 fungi are responsible for making those nutrients  
20 available, but water is responsible for the  
21 uptake.

22 Aquaponics and soil farming both rely

1 on microorganisms to make nutrients available.  
2 And they both rely on water to liquidize the  
3 nutrients so that the plants can use them.

4 On another note, one of the Board  
5 members on Tuesday asked a fellow aquaponic  
6 farmer about mycorrhizae in the soil. And I  
7 wanted to follow-up. What I can say is that  
8 there's a diverse spectrum of microorganisms in  
9 aquaponic systems.

10 Some of them less scientifically  
11 about fungi in aquaponic systems, but as I  
12 understand it, fungi primarily occur in the root  
13 zone. And there's no reason to believe that  
14 mycorrhizae are not present in an aquaponic  
15 environment.

16 Both organic soil farmers and  
17 aquaponic farmers have been experimenting with  
18 adding beneficial fungi to their systems. I  
19 don't think it's appropriate to determine if the  
20 farm is organic or not based on whether fungi are  
21 present.

22 If the presence of fungi on the roots

1 is a requirement for organic certification, then  
2 it should be something that can be tested in both  
3 soil and aquaponic farms. Our organic farms  
4 should be held to the same scientifically  
5 verifiable standards.

6 One more example from nature. Where  
7 I live there is a lot of lava rock. And because  
8 lava rock is very porous, it can hold water, and  
9 we retrieve the plants growing straight out of  
10 the lava rock with no soil at all. Even in  
11 nature, soil is not required. Thank you.

12 MR. CHAPMAN: Thank you. Any  
13 questions from the Board?

14 (No audible response)

15 MR. CHAPMAN: I'm not seeing any  
16 questions from the Board. Thank you very much  
17 for your comments.

18 MS. ARSENAULT: Tom, I just saw Asa  
19 raise his hand.

20 MR. CHAPMAN: Sorry. Asa raised his  
21 hand.

22 MR. BRADMAN: Hi. This is a question

1 I wanted to ask earlier to another aquaponic  
2 producer. But actually, this is really to  
3 everyone that I'm asking, that you think about it  
4 on all sides of this issue.

5 And there was a reference earlier to  
6 kind of support for the CCOF suggestions of kind  
7 of a compromise labeling that would distinguish,  
8 for example, hydroponics and aquaponics. And I  
9 want everyone to think about that. And I've seen  
10 opinions on it from all sides, but I'd like your  
11 opinion on that as well.

12 MS. SABARA: Thank you for that  
13 question. Yes, I think that, you know, organic  
14 is something that customers have learned to rely  
15 on, on choosing organic as a simple way to become  
16 -- and whether and or not it's a food that is  
17 healthy for them and good for the environment.

18 And I think that we need to really  
19 think about the spirit of that organic  
20 certification and try not to get caught up in  
21 politics, for one, but also not getting caught up  
22 in anything that can't be scientifically verified

1 with, you know, real reasons behind changes that  
2 are going to be made.

3 So with that said, I actually --- you  
4 know, we have aquaponics on our label. We are  
5 proud of being aquaponic. And I personally have  
6 no problem being an aquaponic organic provider.  
7 And if you want to make that a separate label,  
8 that's the same difference to me.

9 I do think that aquaponics should be  
10 distinguished from general hydroponics. I think  
11 that that's important. And I think that it  
12 should be --- I think we should just be really  
13 careful before we make things more complicated  
14 for the consumer.

15 Because in my experience, you know,  
16 it's a lot of work to even explain to somebody  
17 what aquaponics is, and to develop that  
18 relationship with our consumers to help them  
19 understand why we're doing aquaponics, and why we  
20 actually think that it's important, and why we  
21 think that aquaponics is actually a great way to  
22 provide stewardship for the environment and for

1 the soil.

2 Because aquaponics, you know, we're  
3 not using a recirculating system for our water.  
4 We're actually providing stewardship for the  
5 soil, because we're not doing anything bad to the  
6 soil, you know, if that makes sense.

7 And we're not sending any of our  
8 organic fertilizers down into the watershed,  
9 which does affect the watershed system. So  
10 there's a lot of things that we're doing that are  
11 benefitting the environment and helping the  
12 organic certification. So, yes, I think that ---

13 MR. CHAPMAN: I need to cut you off.  
14 Two more questions for anyone from Francis and  
15 one from Steve. If you could try to stick to  
16 answering the question as directly as possible.  
17 Thank you.

18 MS. SABARA: Yes.

19 MR. THICKE: Thank you, Shannon, for  
20 your comments. And one comment you made about  
21 all nutrients go through the water, are you  
22 familiar with the principle of contact exchange,

1 that plant roots can touch soil particles and  
2 actually directly exchange ions with the soil  
3 without necessarily going through the water  
4 medium?

5 MS. SABARA: I guess I can't say that  
6 I am an expert in that, on any level. I was  
7 speaking more generally. So I can't really speak  
8 to that specifically.

9 I can say that generally, you know,  
10 the way that plants generally get their nutrients  
11 is through the water. And that would be, I'm  
12 sure, most of the time. And anything other than  
13 getting nutrients through the water is probably  
14 more of a one-off situation and not something  
15 that, I think, is a standard way of nutrient  
16 uptake.

17 MR. THICKE: Thank you.

18 MR. CHAPMAN: Steve?

19 MR. ELA: Well, to follow-up with  
20 that, and I was the one that asked the  
21 mycorrhizae question the other day. But, I mean,  
22 my understanding is that, you know, as we are

1 investigating --- and I think this is a work in  
2 progress in the scientific community --- that we  
3 are seeing that the mycorrhizae are actually the  
4 medium in between the water system and the plant  
5 root.

6           And many times, it's not actually the  
7 plant root directly taking up that nutrient,  
8 although they may be able to, but it's the  
9 mycorrhizal system that forages for those  
10 nutrients and then feeds that into the plant.

11           So I'm curious. I mean, you just  
12 said, you know, some of these plant soil contacts  
13 are one-off. But to me, the research is showing  
14 even more that it's not a direct exchange. You  
15 know, I'd just like to follow-up on that a little  
16 bit with you.

17           MS. SABARA: Okay. So, like I said,  
18 I am not a scientist that has an expertise in  
19 this. So I can get some follow-up information to  
20 you, as I can talk to somebody that has more  
21 actual knowledge of this subject.

22           What I can say is that, like I said,

1 I really do think that whatever the standards  
2 are, they need to be applied to both soil farmers  
3 and aquaponic farmers. There shouldn't be any,  
4 you know, any reason that aquaponics should be  
5 excluded when we don't have scientifically  
6 researched, you know, actual scientific research  
7 that says it's not happening in aquaponic  
8 systems.

9 So far, it's just hearsay. You know,  
10 there's no reason to think that mycorrhizae are  
11 not in an aquaponic system.

12 MR. CHAPMAN: Thank you, Shannon.  
13 That's it for questions on our end. So we're  
14 going to move to the commenter that's -- because  
15 we were moving quite ahead of schedule now, not  
16 ahead of schedule, but we're still doing great.  
17 So we're going to go back to Dana Perls. Dana  
18 Perls, are you on the line?

19 MS. PERLS: I am. Can you hear me?

20 MR. CHAPMAN: Yes, we can. Hold on  
21 one second.

22 MS. PERLS: Okay.

1           MR. CHAPMAN: After Dana, we'll go to  
2 Roberto Ramirez, and then Robin Seeley. Dana, if  
3 you can start with your name and affiliation, and  
4 then proceed with your comments.

5           MS. PERLS: Great. Well, thank you  
6 for circling back. Apologies for being late. My  
7 name is Dana Perls. And I am a senior food and  
8 technology campaigner with Friends of the Earth  
9 U.S.

10           And I would like to comment on  
11 excluded methods in synthetic biology. I've been  
12 tracking fishing for four and a half years, and  
13 I'm honored to be part of the Materials  
14 Subcommittee Ad Hoc Working Group on the issue.

15           I'd like to provide comment on the  
16 Materials Subcommittee proposal on excluded  
17 methods. We'd like to strongly urge the  
18 Materials and GMO Subcommittee to include several  
19 techniques in the excluded methods list, namely  
20 cisgenesis, intragenesis, agroinfiltration, and  
21 transposons. They should be included in its  
22 excluded methods terminology.

1           We want to ensure that we have an  
2           organic certification which really addresses  
3           these emerging biotechnologies and new techniques  
4           which some are trying to apply to agriculture.

5           And in November 2016, last year the  
6           NOSB voted unanimously to update US organic  
7           standards to exclude ingredients derived from  
8           next generation genetic engineering and gene  
9           editing.

10           As NOSB already established, these new  
11           genetic engineering techniques are not compatible  
12           with organic and sustainable agriculture, and  
13           currently the list of techniques that are  
14           excluded methods is incomplete. And there are  
15           several currently marked TBD techniques that we  
16           believe fall within the NOSB definition of  
17           genetic engineering and modern biotech.

18           So again, we want to include  
19           cisgenesis, intragenesis, agroinfiltration, and  
20           transposons. The first three, cisgenesis,  
21           intragenesis, and agroinfiltration, all involve  
22           intentional genetic modification. And these

1 three techniques clearly fall under the NOSB's  
2 already adopted definition of modern  
3 biotechnology and therefore should be excluded  
4 techniques.

5 And lastly, I just want to note that  
6 although transposons are, in fact, used in some  
7 cases to make genetically engineered animal  
8 vaccines, and those are not prohibited in  
9 organic, they do fall under the new criteria for  
10 excluded methods that was adopted last year.

11 So we recommend that, as a  
12 clarification, transposons for use in creating  
13 genetically engineered plants or animals should  
14 be listed in the guidance on excluded methods and  
15 the terminology chart as excluded.

16 And then perhaps it could be  
17 accompanied with a note clarifying that their use  
18 in animal vaccines may be currently permitted  
19 under the current rules, permitted in organic,  
20 but that it should be excluded for use in  
21 creating genetically engineered plants and  
22 animals.

1                   So just to sum up, you know, we  
2                   support the improvements and updates to the  
3                   standards which are going to preserve the  
4                   integrity of organic classification. And in  
5                   order for that to really happen, NOSB should  
6                   exclude the new gene editing and some  
7                   biotechniques from organic by updating the list  
8                   of excluded techniques.

9                   MR. CHAPMAN: Thank you, Dana.

10                  MS. PERLS: Yes.

11                  MR. CHAPMAN: Any questions from the  
12                  Board?

13                  (No audible response)

14                  MR. CHAPMAN: Not seeing any  
15                  questions, so thank you very much. And moving  
16                  on, we have Roberto Ramirez next, followed by  
17                  Robin Seeley, and then Marc Ketchel.

18                  Roberto, are you on the line with us?

19                  MR. RAMIRIZ: Yes, I'm here. Can you  
20                  hear me?

21                  MR. CHAPMAN: Yes, we can. Roberto,  
22                  if you could start with your name, and

1 affiliation, and then move into your comments.

2 MR. RAMIREZ: Sure. Good afternoon.

3 My name is Roberto Ramirez. I manage 70 acres  
4 of substrate grown berries in upstate California.  
5 Twenty-six acres of the 70 are organic.

6 I am here to encourage the members of  
7 the Board to vote no on the Crop Subcommittee  
8 recommendation for container production. There  
9 are several reasons why these proposals should be  
10 voted no. But here are some of the main reasons.

11 Recommendation is not reasonable for  
12 any crop. It is prescriptive to follow certain  
13 farming practices that are barred from advisable  
14 and not well sustained.

15 It is not in the spirit of organics,  
16 because is not considered in site-specific  
17 conditions. And it would create pollution to my  
18 soils and my farm by being across the  
19 distribution.

20 The recommendations might exclude  
21 growing systems different to soil farming because  
22 these will create toxic conditions for crops at

1 the root zone level avoiding any new growth.

2 Perennial crops are clearly not  
3 considered. Providing annual nitrogen needs of a  
4 plant in a solid form would require me to incur  
5 an excessive labor hours and waste of resources.  
6 To fulfill this requirement after year one will  
7 make my business unviable. Minimum wage in  
8 California is increasing gradually, and it will  
9 get up to \$15 per hour by 2021.

10 Soluble or liquid form of nitrogen  
11 production does not mean it is on the viable form  
12 for plants which is the ionic form of elements,  
13 especially nitrogen. For nitrogen to be  
14 available to plants from the organic fertilizer  
15 solid, liquid, or soluble, it needs to go through  
16 the nitrogen cycle that, by the way, needs to  
17 happen in solution.

18 I urge the Board to vote no on this  
19 recommendation and for it to be sent back to  
20 Crops Subcommittee for further definition of  
21 container growing standards.

22 There are less prescriptive farming

1 practices and more inclusive of alternate  
2 production practices that still remain true to  
3 the spirit and principles of organic farming.

4 I would like to thank the Board for  
5 the opportunity to comment on this subject of  
6 interest to my farming and for their time and  
7 effort. I will be happy to answer questions.

8 MR. CHAPMAN: Thank you, Roberto. Any  
9 questions from the Board?

10 I am not seeing, oh, Francis, go  
11 ahead.

12 MR. THICKE: Quickly, can you tell us  
13 what you use for a substrate or growing medium in  
14 your operation?

15 MR. RAMIREZ: Yes, of course. That is  
16 how we determine what kind of substrate we're  
17 going use is depending on the site-specific  
18 conditions, meaning that one of the main  
19 components is water quality, the climate, and  
20 depending on that, we will variate the components  
21 of it.

22 But mainly, it might be composed of

1 coco coir, peat moss, perlite, gypsum, rock  
2 phosphate. And we're starting to experiment a  
3 little bit with some burning compost.

4 We've been doing this, or I've been  
5 doing this for about a little bit over a year  
6 with some of the berries that we work with. And  
7 it's still very early for us to define a set  
8 percentage of this and that. So we're still  
9 discovering that as we go on a commercial size  
10 farm.

11 MR. THICKE: Thank you.

12 MR. CHAPMAN: Thank you. Thank you,  
13 Roberto, I'm not seeing any other questions from  
14 the Board. So we're going to move on.

15 MR. RAMIREZ: Okay.

16 MR. CHAPMAN: Next we have Robin  
17 Seeley, followed by Marc Ketchel, and then Caleb  
18 Adams. Robin, are you on the line?

19 MS. SEELEY: Yes, I am.

20 MR. CHAPMAN: Excellent. And you can  
21 start with your name, and affiliation, and then  
22 proceed to your comments.

1 MS. SEELEY: Yes. I'm Robin Hadlock  
2 Seeley. I'm a senior research associate at  
3 Cornell University and also a faculty fellow at  
4 the Atkinson Center for a Sustainable Future at  
5 Cornell.

6 Thank you all for your time and  
7 interest during the webinar. My focus is the  
8 issue of marine materials, also known as marine  
9 algae, aquatic plant extract, kelp, and seaweed.  
10 I've been working on wild sea harvesting for 17  
11 years.

12 Most recently, NOSB documents relating  
13 to November of 2016, the marine materials  
14 Discussion document. It identifies several  
15 issues among the 205.207 wild crop harvesting  
16 standards.

17 And the discussion document ended by  
18 stating production of marine materials must be  
19 based on the maintenance of biodiversity of  
20 natural aquatic ecosystems and the continuing  
21 health of the surrounding aquatic and terrestrial  
22 ecosystems.

1                   What is defined here, as one of the  
2                   kelps, which is important in agriculture and  
3                   critically important to marine systems, is as is  
4                   shown here.

5                   After getting support the marine  
6                   community of over 100 species of birds, fish, and  
7                   invertebrates, including a school of fish shown  
8                   in Panel A in this slide, and the Atlantic puffin  
9                   shown here in Panel C.

10                  Panel D shows what happened underwater  
11                  after a machine seeding harvester. Removal of  
12                  whole plants creating empty space that will  
13                  quickly be rebuilt like a forest clear cut with  
14                  species that do not provide the same logical  
15                  services and the shore bird seeding forest which  
16                  has had its canopy removed.

17                  I believe there must be further  
18                  guidance for NOP on the production of marine  
19                  algae or seaweeds for any product, whether it is  
20                  organic and derived from wild seaweed, and which  
21                  addresses the problem of whether the cutting of  
22                  the wild crop meets standards already established

1 for wild crop harvesting in 205.207, and  
2 establishes more appropriate standards for  
3 certifiers working in the marine environment so  
4 the consumer can be assured that products based  
5 on this wild seaweed harvest maintain  
6 biodiversity and the health of marine ecosystems.

7 Canadian researchers have stated that,  
8 because of human pressures, the protection of  
9 marine vegetative habitats should be a national  
10 priority. I look forward to further discussions  
11 and work with you on this important issue. Thank  
12 you.

13 MR. CHAPMAN: Thank you. Any  
14 questions from the Board?

15 (No audible response)

16 MR. CHAPMAN: Not seeing any  
17 questions, oh, sorry. Emily? I don't know if  
18 you're unmuted.

19 MS. OAKLEY: Thank you. So, Dr.  
20 Seeley, you have this IB or photo. Could you  
21 tell how that image might compare differently  
22 with a method of harvesting other.

1 MS. SEELEY: Mechanical harvesting  
2 tends to make a higher rate.

3 MR. CHAPMAN: Thank you. Any other  
4 questions from the Board?

5 (No audible response)

6 MR. CHAPMAN: Seeing none, Robin,  
7 thank you very much for your testimony today.

8 Up next Marc Ketchel, followed by  
9 Caleb Adams, and then Dave Talbert. Marc, are  
10 you on the line with us?

11 MR. KETCHEL: Yes, can you hear me?

12 MR. CHAPMAN: Yes, we can, Marc. If  
13 you can start with your name, and relevant  
14 affiliation, and proceed with comments.

15 MS. ARSENAULT: Okay, Tom, and Marc,  
16 can I just interrupt for a second? This is  
17 Michelle. We're getting a little background  
18 noise. So just a reminder for everyone on the  
19 line to mute yourself. Thanks.

20 All right, Marc, sorry to interrupt.

21 MR. KETCHEL: No worries, thank you.  
22 Thank you very much. I appreciate the

1 opportunity to address the Board.

2 My name is Marc Ketchel, and I am a  
3 certified handler. My company is the Organic  
4 Pure Foods Company. I've been certified in one  
5 company or another since the inception of this,  
6 so I have a little bit of background with organic  
7 certification.

8 And I'm currently in the chia business  
9 and have been for about ten years. I've traveled  
10 extensively all over the world and looked at  
11 every chia farm that I could find. And we have a  
12 very big problem right now in the marketplace  
13 with contamination, pesticide contamination in  
14 chia.

15 We do have it, obviously, with other  
16 grains but chia in particular. And that's my  
17 specialty. And I'd like to ask the Board very  
18 simply to include glyphosate, as a minimum, there  
19 could be many others but glyphosate as a minimum,  
20 as the largest and the most widely used herbicide  
21 in the world.

22 And it's not one of the required tests

1 that the certifiers, whenever there's -- I guess,  
2 my understanding is there's many triggers to when  
3 a certifier can request a certification of a  
4 producer or a processor.

5 And the tests that are required or  
6 that are expected, again I'm not very clear about  
7 the exact rule, but glyphosate is not on the  
8 list. And I think that's a major oversight as,  
9 again, the largest, most widely used herbicide in  
10 the world.

11 So that's my simple request. I think  
12 we need to tighten this up. We have -- we tested  
13 about, just for the Board's information, I mean,  
14 we tested about 100 different lots.

15 And when I say lots I'm talking about  
16 representative composite field samples for over  
17 100 different fields last year. And all of them,  
18 these were certified organic producers, all of  
19 them found glyphosate contamination, every single  
20 one of them.

21 And my company has a zero tolerance  
22 for pesticides. We don't want --- we want zero.

1 I know that's not reasonable, but that is what we  
2 continue to maintain, and I continue to try to  
3 push for it.

4 And I've tried to create, and we are  
5 creating independent organic zones in South  
6 America where we're growing. And we're talking  
7 about very large tracts of land where there's no  
8 contaminated processes going on within miles,  
9 kilometers.

10 That's it, a real simple request. I  
11 think it can be done very easily. And the  
12 upstream --- the downstream costs to producers  
13 and to the market, with everybody involved, is  
14 way more than the initial testing.

15 (Off the record comments)

16 MR. KETCHEL: Yes, that's great, thank  
17 you.

18 MR. CHAPMAN: Thank you. I see I have  
19 a question from Scott.

20 MR. RICE: Yes. I have a question and  
21 a comment. Marc, when you have done your testing  
22 of the chia lots, are you doing that --- what's

1 your timeframe? Are you, for instance, is it  
2 done in the field? Are you doing it with  
3 products in storage or how is that --

4 MR. KETCHEL: No. Okay, yes, good  
5 question. The whole testing process is a bit of  
6 a --- it's a conundrum. But giving the long and  
7 short answer directly to your question is we kept  
8 that normally in the processing, in the post-  
9 harvest processing in the plant. Which -- well,  
10 in the plant, what I mean is the processing  
11 plant.

12 And so the process of chia, again,  
13 very briefly, is that it's harvested with a  
14 combine in the field, and then it is brought to  
15 the processing plant where it's de-hulled and  
16 cleaned up in the ---

17 MS. ARSENAULT: Sorry.

18 MR. CHAPMAN: We're getting someone  
19 who is speaking in the background.

20 (Off the record comments)

21 MS. ARSENAULT: Thanks, Tom. Hi, just  
22 a reminder to please keep yourself on mute.

1 We're getting background conversations. Thanks.

2 MR. KETCHEL: Did I get that question  
3 answered sufficiently, or should I clarify?

4 MR. RICE: No, I think I got it. I  
5 have just a comment on that. But, you know,  
6 while glyphosate may not be in the NOP's list of  
7 materials to test for, it is something that  
8 certifiers could certainly opt to do when there's  
9 a risk identified.

10 And my understanding of, you know, the  
11 challenge of the testing for glyphosate is that  
12 you've got a very short half-life. So often you  
13 may not see a crop of any kind tested for  
14 glyphosate. It's typically because of a report  
15 of spraying, and there's a fairly close reaction  
16 time when a certifier can get their soil samples.

17 But it's, you know, it is an option  
18 for certifiers. And I guess my question to you  
19 is are these, if it's present, something that's  
20 being shared with your certifier on a regular  
21 basis or when you find that? That's something  
22 that, it's required by the regulation and could

1 help, you know, your systems become a little  
2 stronger in tracking that down.

3 MR. KETCHEL: Okay. Well, let me  
4 again briefly, in the interest of time, tell you  
5 that, yes, we are communicating with my  
6 certifier. We have a very close relationship. I  
7 spoke to him this morning, as a matter of fact.  
8 And I'm one of the most knowledgeable people in  
9 the certification business.

10 And this is what we've done. We test  
11 --- we don't let any of this material come in to  
12 our company. We don't let any material come in  
13 to the country, because we do all of our testing  
14 down there. And then we test it again up here,  
15 sometimes twice up here.

16 So we make sure that we don't have it  
17 in our material. But that material is being sold  
18 to other buyers that are more unscrupulous. I  
19 mean, most buyers don't want to even hear about  
20 it. They don't want anybody to even talk about  
21 it. Don't ask me about pesticides. I don't test  
22 for pesticides. They don't, and they won't.

1                   And so we've got a small handful of  
2 high quality buyers that buy large quantities  
3 that actually do test. And they test themselves.  
4 So we test down there, we test up here. Then  
5 some of my, you know, good buyers, they test  
6 themselves. So that's the way we're dealing with  
7 it.

8                   But as far as your question about the  
9 half-life and all that, I'm sorry, but we're not  
10 finding that at all. We're testing weeks and  
11 months later and still finding material.

12                   So I don't know, again, I'm not a  
13 scientist. But I just want to share that  
14 information. I'm giving you practical, you know,  
15 real life examples of what's actually going on.

16                   MR. RICE: Thank you. Thank you,  
17 Marc.

18                   MR. CHAPMAN: Marc, I have a question  
19 for you, and I don't know if you can answer it.  
20 But can you comment on the conventional practice  
21 of chia production, to do a pre-harvest  
22 desiccation spray ---

1                   MR. KETCHEL: I would say close to 100  
2 percent.

3                   MR. CHAPMAN: Okay.

4                   MR. KETCHEL: And again, some of the  
5 organic producers are doing the same thing.

6                   MR. CHAPMAN: Yes. And I think the  
7 intention of the testing was that the USDA had  
8 originally put out, was looking for pesticides  
9 used in the production of a crop, not  
10 particularly the desiccation of a crop. But your  
11 point is well raised, in my opinion.

12                   MR. KETCHEL: So, I mean, until --- I  
13 mean, I don't understand what you're saying.  
14 Because production includes all the waste that  
15 gets in the bag, right. Until it gets in the  
16 bag, I mean, desiccation is part of the  
17 production process.

18                   MR. CHAPMAN: I agree, I agree with  
19 you. I think that may not have been the view  
20 when that entire list was originally sent out.  
21 So, like I said, your point is well made. And I  
22 understand what you're saying.

1 PARTICIPANT: I have a question here  
2 from Sue Baird.

3 MR. CHAPMAN: Sue?

4 MS. BAIRD: Yes, hi. I really commend  
5 what you're doing. I think it's important. I  
6 think, philosophically, I truly, truly support  
7 what you're doing.

8 I wonder though if we tested every  
9 commodity crop, if you would have any organic  
10 crop production, especially corn and some of the  
11 things that pollination happens. And what do we  
12 do? I ponder this question.

13 And so I commend you. But I just want  
14 to figure to out what to do. Do we just get rid  
15 of all organics? Because I would dare say that  
16 most of the organic crops are contaminated at  
17 some level. Non-GMO projects and other non-GMO  
18 testing requires testing and established  
19 policies. This is established policies. Is that  
20 where we go with this thing?

21 MR. KETCHEL: Should I make a brief  
22 comment?

1 MR. CHAPMAN: Yes, please.

2 MR. KETCHEL: Well, I was one of the  
3 first people to kind of deal with this way back  
4 when the law was being put together. And I've  
5 heard this argument before.

6 But I can tell you that it is possible  
7 for us to establish a more stringent guideline.  
8 And that's all I'm saying. I'm not saying that  
9 100 percent zero is possible for all crops. But  
10 I think that we need to, and I think the Board is  
11 hearing this, that we do need to get a little bit  
12 more rigid in our guidelines and see if we can  
13 clamp down a little bit more.

14 We've got just too --- it's too much  
15 right now. There's too much room for people to  
16 take advantage of the situation. And that's  
17 what's happened.

18 MR. CHAPMAN: Thank you very much for  
19 your comments.

20 MR. KETCHEL: Thank you very much for  
21 your time, appreciate it.

22 MR. CHAPMAN: Up next we have Caleb

1 Adams, followed by Dave Talbert.

2 MS. ARSENAULT: We're getting some  
3 feedback. And I can't hear you anymore --

4 (Off the record comments)

5 MS. ARSENAULT: Please put your phone  
6 on mute ---

7 (Off the record comments)

8 MS. ARSENAULT: Push the button on  
9 your phone, please hit Star 6. And if you're on  
10 your computer with a headset, please make sure  
11 your speakers and mic are muted. That's usually  
12 when we get feedback.

13 MR. CHAPMAN: Yes, that's probably the  
14 issue with Caleb. Caleb, I just muted you in  
15 another way. I'm going to try to un-mute you.  
16 But please turn your speakers down.

17 MR. ADAMS: Okay, can you hear me?

18 MR. CHAPMAN: Yes, I can hear you.

19 MR. ADAMS: Perfect, great. So I am  
20 Caleb Adams. I am the VP of Organic Research and  
21 Development for CleanWorld. We are an anaerobic  
22 digester technology company.

1                   So I tried to time myself to see how  
2 long my comments would take. And I went slightly  
3 over and hour in three minutes. So I might not  
4 be able to cover everything related to the  
5 subject.

6                   I wanted to discuss a few of the  
7 benefits and issues related to the use of  
8 digesting and organic farming. Anaerobic  
9 digesters offer some key benefits to the organic  
10 industry. And anaerobic digesters are critical  
11 for diverting organic waste from landfills and  
12 recycling nutrients back to farms, an important  
13 aspect for organic farming.

14                  Anaerobic digesters are also the  
15 documented carbon negative process that will help  
16 reduce the carbon footprint of the organic  
17 industry while producing renewable energy in the  
18 form of electricity, vehicle fuel, and heat.

19                  For the organic industry to utilize  
20 digestive fertilizers, the NOP guidelines and  
21 regulations need to be reconsidered to address  
22 issues related to digesting.

1           Due to the time restrictions for this  
2 comment period, I'll only be able to address one  
3 example. However, I would propose a follow-up to  
4 discuss the issues in more detail.

5           One of the issues related to manure,  
6 that is related to manure digesters. The  
7 guidelines have put a 90 to 120-day restriction  
8 on manure digesting. That is 5006 manure  
9 processing has been adopted to manure digestate  
10 and basically states that the digestate must be  
11 pasteurized to 165 degrees amp and dried to 12  
12 percent moisture content.

13           This makes sense for the solids  
14 fractions but does not take into consideration  
15 that the digestate is comprised of two fractions,  
16 a liquid and a solid fraction.

17           The liquid fraction can comprise up to  
18 95 percent of the total volume of the digestate  
19 and cannot be dried to 12 percent moisture  
20 content. The pasteurization step alone is  
21 sufficient to mute pathogen reduction as you can  
22 see by multiple peer-reviewed papers.

1                   One of the papers out of Finland,  
2                   Methods to Reduce Alphagen and hypoorganisms in  
3                   manure, states that the European Union  
4                   regulations on objectives implemented in 2002  
5                   required digesters to pasteurize at 17 for 60  
6                   minutes. It does not require drying insufficient  
7                   for pathogen reduction and food safety.

8                   I highly recommend that this guidance  
9                   be revisited and adapted to address the liquid  
10                  fraction. I also hope that the Board will reach  
11                  out to members of the digester industry to  
12                  discuss all of the potential issues related to  
13                  the digester use. Thank you.

14                  MR. CHAPMAN: Thank you. Any  
15                  questions from the Board?

16                  (No audible response)

17                  MR. CHAPMAN: I'm not seeing any  
18                  questions at this time. Thank you very much,  
19                  Caleb, for your comments.

20                  Up next we have Dave Talbert, then  
21                  Mark Lipson, and Miraj Patel. Dave Talbert, are  
22                  you on the line?

1 MS. ARSENAULT: We haven't been able  
2 to find Dave on the line, Tom.

3 MR. CHAPMAN: All right. Dave, going  
4 once, going twice. Mark Lipson, are you on the  
5 line? I can see you on the web version, but I  
6 don't ---

7 MR. LIPSON: I am on the line.

8 MR. CHAPMAN: Excellent. Hi, Mark.

9 MR. LIPSON: I just had to find my  
10 mute button. Thank you.

11 MR. CHAPMAN: So after Mark is Miraj  
12 Patel, which I have not seen you on the line.  
13 And after Miraj is Bill Wolf and then Kyle  
14 Manico.

15 Mark, if you would us know who you  
16 are, can you start off with your name and  
17 affiliation?

18 MR. LIPSON: Hi, this is Mark Lipson.  
19 I'm a partner in Molino Creek Farming Collective.  
20 I'm currently the senior program and policy  
21 specialist at the Organic Farming Research  
22 Foundation in Santa Cruz, California. And I'm

1 the former USDA organic policy advisor.

2 On behalf of OFRF, I'm commenting  
3 today on the research recommendations of the  
4 Board. I'm not offering any specific input on  
5 individual items, but I just wanted to comment on  
6 the overall efficacy and evolution of the Board's  
7 function regarding research recommendations and  
8 priorities.

9 It is my observation that the Board's  
10 recommendations have been useful to the USDA  
11 Organic Research and Extension Initiative and the  
12 Organic Transitions Research Program and has, you  
13 know, produced some results, for example,  
14 research work on thiamine and antibiotic pest  
15 controls that have been funded by the OREI  
16 program, a direct result of the Board's and the  
17 NOP program's expressions of research needs. So  
18 there is a track record of effect for the Board,  
19 you know, continuing to make these  
20 recommendations.

21 Well, I'll suggest that we need a kind  
22 of comprehensive review of how this process is

1 functioning and how well it's able to actually  
2 affect the research portfolios and the timeliness  
3 with which scientific work gets done to meet the  
4 needs of the program and the organic sector.

5 I'm not very clear on how that's been  
6 happening. My understanding is that the latest  
7 recommendations continue to be sent to the  
8 research and extension officials in USDA by the  
9 program. And those have, you know, clearly  
10 showed up in the annual request for applications  
11 by the OREI program.

12 It would be good if we are able to do  
13 something more comprehensive, looking at all of  
14 these things that have accumulated on the list  
15 over the years, and make an assessment of what  
16 kind of work has been done, the extent to which  
17 it's meeting the needs, and how there might be  
18 alternative ways of meeting the need for more and  
19 better science.

20 And, you know, I just want to --- this  
21 is more of a personal observation, in 1990 when  
22 the Organic Foods Production Act was passed, what

1 got left on the cutting room floor was a research  
2 title to the act.

3 We didn't manage to get around to  
4 getting funding for organic research and  
5 establishing an organic research program within  
6 USDA. And so right about the time that --

7 MR. CHAPMAN: Mark, I'm going to have  
8 to cut you off there. Sorry about that.

9 MR. LIPSON: No, it's all right.

10 MR. CHAPMAN: I do have a question  
11 for you from Emily.

12 (Off the record comments)

13 MR. CHAPMAN: Emily, go ahead.

14 MS. OAKLEY: Thank you. Mark, I agree  
15 with your assessment. And I wanted to ask you if  
16 you had suggestions for how the NOSB might assess  
17 the work that's been done on these issues and  
18 elaborate alternative ways to get more research  
19 done on the science.

20 Do you think a discussion document to  
21 the broader stakeholder community to elucidate  
22 what's been done and another alternative would be

1 the right approach? Or do you have other  
2 suggestions?

3 MR. LIPSON: First suggestion is the  
4 document that was produced by Organic Farming  
5 Research Foundation last year entitled, "Taking  
6 Stock," which is a pretty comprehensive review of  
7 all the work that the Organic Research and  
8 Extension Initiative has done.

9 And part of that report does hold up  
10 the work that's been produced with OREI funding  
11 against the issues that have been raised by NOSB  
12 and NOP with respect to materials, and practices,  
13 and their relationship to the rule.

14 So that's a very good place to start.  
15 There's still a lot of material there that, you  
16 know, hasn't really been dug into by anyone.

17 So development of a discussion  
18 document seems like a really good idea, trying to  
19 convene a meeting with the USDA Research  
20 Extension Education Offices to discuss their  
21 approach to reviewing the same questions would  
22 also be productive. And I think the program, you

1 know, and the ANS administrator could initiate  
2 that.

3 MR. CHAPMAN: Thank you, Mark. I have  
4 a question from Ashley.

5 MS. SWAFFAR: Hi, Mark. Thanks for  
6 your comment. I just wanted to ask if you could  
7 send that report to Michelle, so she can forward  
8 to the rest of us.

9 MR. LIPSON: Absolutely.

10 MS. SWAFFAR: Thank you.

11 MR. CHAPMAN: All right. I'm not  
12 seeing any other questions. Mark, thank you for  
13 your comment.

14 MR. LIPSON: Thank you all very much.

15 MR. CHAPMAN: Up next we had Miraj  
16 Patel. We haven't found him online. So, that's  
17 line 1. Raj, are you here? And twice. Up next  
18 is Bill Wolf. Bill, are you here?

19 MS. ARSENAULT: Bill is on the line,  
20 Tom. He came in a little while ago. So, Bill,  
21 if you're talking, you're on mute.

22 MR. WOLF: Can you hear me now?

1 MS. ARSENAULT: Yes, we can.

2 MR. CHAPMAN: We can hear you now,  
3 Bill. Bill, hold on one moment. After Bill we  
4 have Kyle Manico, and then Kristen Adams. Bill,  
5 if you could start with your name and affiliation  
6 for the record?

7 MR. WOLF: I'm Bill Wolf, with Wolf,  
8 DiMatteo and Associates. I also have an organic  
9 farm, and am founder of Thorvin, a certified  
10 organic kelp seaweed company.

11 Wolf DiMatteo helps farmers, food  
12 companies, NGOs, and Governments to grow the  
13 organic industry. Since 1992 we have presented  
14 comments to the NOSB. Each in person  
15 presentation for the last 25 years was intended  
16 to encourage continuous improvement of the  
17 organic system.

18 For this meeting we submitted written  
19 comments on three topics that I request you read  
20 and act on regarding sodium nitrate,  
21 biodegradable mulch, and inerts. Past comments  
22 from the spring meeting are also relevant,

1 including specific recommendations on lowering an  
2 algae.

3 In this three minutes I'd like to  
4 share some strategic requests intended to improve  
5 the organic standards on the National List, these  
6 three specifics.

7 One, require an organic when available  
8 for the National List specifically in Section  
9 605, not just 606. Applying commercial  
10 availability will stimulate innovation.

11 Two, don't make the regulations, and  
12 especially the annotations, too proscriptive. It  
13 causes unintended consequences, and makes it  
14 harder to interpret. Certifications should still  
15 be based on common sense principles.

16 And three, place and keep materials on  
17 the National List that will be useful, and align  
18 with the organic paradigm. The National List is  
19 a toolbox. And the goal is not to have it  
20 shrunk, but rather to have producers and  
21 handlers grow organic with integrity.

22 We need choices, not just one solution

1 for a specific problem. So, how do you decide on  
2 these materials and issues? Let's okay an  
3 organic.

4 I'd like you to remember the slides  
5 I've shared with you in the past about thinking  
6 like an earthworm. Imagine what produces and  
7 practices promote our biotic living system across  
8 all walks of life. Visualizing this can help  
9 sort out what should be allowed, what should be  
10 unallowed organic practice.

11 So, this criteria quantifies this  
12 principle, but was not intended to overly  
13 restrict it to a box organic producers and  
14 handlers need. So again, we ask don't make  
15 shrinking the National List to a box a goal.

16 Be open to innovation and creativity  
17 that fits the organic philosophy. And realize  
18 that the precautionary principle truly cuts both  
19 ways. We do have a responsibility to act when a  
20 better solution emerges. Your vote helps  
21 increase organic acreage and earthworms.

22 Finally, thank you. As a volunteer

1 Board you are asked to take many challenging  
2 questions. I appreciate that your efforts can  
3 make organics a powerful part of transforming  
4 agriculture. I welcome questions.

5 MR. CHAPMAN: Thank you, Bill. Any  
6 questions for Bill? Emily, I don't know if the  
7 question was for Bill. Do you have a question?

8 MS. OAKLEY: It was actually just to  
9 follow up on the last one. But that's okay.  
10 Although I do think it's interesting, and would  
11 like Bill to elaborate further on his 605  
12 comment, in terms of looking for a certified  
13 organic unavailable. And then you can mute me.

14 MR. WOLF: Well, thank you for asking.  
15 We've been having that, this discussion about the  
16 idea of applying commercial availability to 605,  
17 especially to natural materials on 605, for  
18 probably decades.

19 And it hasn't gotten much traction.  
20 But it would solve a number of problems that  
21 occur when people come forward and actually  
22 develop a certified organic version of a

1 currently not organic crude ingredients that's  
2 allowed.

3           You may not have been around for the  
4 yeast wars. But it was pretty painful, even on  
5 the attempt to clarify yeast is a good example of  
6 that. And it's not, it shouldn't be a difficult  
7 change. And in fact, aligns with some of the  
8 international approaches to standards.

9           I'm tempted to say similar things  
10 about 601 and 603, but in a different context.  
11 Because, for example, the Canadian organic regs  
12 require the use of organic sources of fertilizers  
13 when it's commercially available.

14           So, if you can get renewal from an  
15 organic farm, and that system, we grow the system  
16 enough so that we have that capacity, then that  
17 becomes a commercial availability requirement.  
18 Thank you for the opportunity.

19           MR. CHAPMAN: Thank you, Bill. I also  
20 have a question from Harriet. Harriet, you're on  
21 mute. Hold on. Harriet, go ahead now.

22           MS. BEHAR: Hello. Okay. Bill, just

1 in a short sentence or two, do you support the  
2 Crop Subcommittee proposal on hydroponics?

3 Coming --

4 MR. WOLF: Whoa. In one sentence?  
5 Honestly, I think that you parse the issue, and  
6 it's a challenging issue. I'm not thrilled with  
7 the idea of drilling down to the measuring of  
8 nitrogen, and creating that very challenging  
9 method of verification.

10 Because we already, we have enough  
11 problems with certification review just taking  
12 the grading standard as an example. I think  
13 you're, I think it's getting close. But there is  
14 some, been some really good comments made.

15 One more thought. And I just have to  
16 share it. I think that there is room for some  
17 form of aquaponics system, you know, in the  
18 organic paradigm. And I think we have to  
19 understand that better.

20 I think reaching out to someone like  
21 Dr. John Todd would be a useful tool in that  
22 conversation. Thank you. Thanks for the

1 opportunity.

2 MR. CHAPMAN: Thank you, Bill. I'm  
3 not seeing any other questions. So, we'll move  
4 on to the next commenter. And up next we have  
5 Kyle Manico. We haven't found you on the line.  
6 Kyle, are you here? Kyle going once, going  
7 twice. All right. And after Kyle we have  
8 Kristen Adams. Kristen, are you on the line?

9 MS. ADAMS: I am. Can you hear me?

10 MR. CHAPMAN: We can, Kristen. Hold  
11 on one second. After Kristen we have Damon  
12 Seawright. Damon, I haven't seen you on the  
13 line. And after Damon is Edwin Horton. And then  
14 Eric Sideman. Kristen, if you could start with  
15 your name and affiliation?

16 MS. ADAMS: I'm Kristen Adams, MOSA,  
17 Midwest Organic Services Association. Thank you  
18 as always for the opportunity to provide comments  
19 on both field and greenhouse container production  
20 with special documents, and the hydroponic and  
21 container growing recommendations.

22 MOSA currently certifies about 2,000

1 organic operations throughout the United States,  
2 including 349 clients certified for greenhouse  
3 production, about three clients in five for  
4 aquaponic production, and the same for hydroponic  
5 production.

6           Regarding the field and the greenhouse  
7 container production discussions last few  
8 minutes, we support the community having this  
9 discussion, and the development of guidance as  
10 needed.

11           However, our concern is the 20 percent  
12 limit of the plant's nitrogen requirements being  
13 supplied by liquid feeding, and the 50 percent  
14 limit of the nitrogen being added to the  
15 container after the crop has been planted.

16           Fertility applications of all types of  
17 crops should be addressed better. But at this  
18 junction the certifiers don't have for them  
19 measurement requirements in place for field grown  
20 crop production.

21           We feel that this proposal would put  
22 an unfair record-keeping requirement on organic

1 container growers, and would add considerably to  
2 the certification and inspection process.

3 We also have questions, of course.  
4 Will certifiers need to verify all stages in  
5 growth, utilizing different containers when those  
6 are up stages? Or will the growth, or will the  
7 measurement just be in the final container?  
8 Additionally, who determines the nitrogen  
9 requirements for the plant growth?

10 Regarding limiting the use of  
11 artificial light to a specific number of hours  
12 per day, plants do have a circadian rhythm, that  
13 like humans can be adjusted and disrupted by  
14 external cues, including light they receive.

15 At this time MOSA does not have a  
16 recommendation regarding specific numbers of  
17 hours per day that various plants should be  
18 exposed to light.

19 However, we support continued research  
20 in the area, and the development of requirements  
21 that are balanced and help the circadian rhythms  
22 of plants, and a practical approach for all

1 growers.

2           Regarding the spectrum and intensity  
3 of artificial light limitations, light is a  
4 nutrient to plants. And different spectrums of  
5 light are responsible for determining when  
6 plants' flower grow, when they fruit, and also  
7 affects the diurnal processes within the  
8 circadian rhythm.

9           And our growers need to have a light  
10 setting that's the proper type of light  
11 wavelengths for the plant life. And must  
12 encourages continued research and the continued  
13 development of proposals that uphold organic  
14 integrity, and again are practically applicable  
15 to a variety of site specific for regional  
16 growing requirements.

17           Regarding hydroponics and aquaponics,  
18 MOSA appreciates, as always, the work of the  
19 Crops Subcommittee. However, MOSA does not  
20 support the proposal that hydroponic and  
21 aquaponic systems be added as prohibited  
22 practices.

1                   We support the growth of the organic  
2 industry, and the inclusion of food produced by  
3 hydroponic and aquaponic production, and  
4 alternative labeling. Thank you.

5                   MR. CHAPMAN: Thank you. I have a  
6 couple of questions. Francis, and then Terry.

7                   MS. ADAMS: Go ahead.

8                   MR. THICKE: Thank you for your  
9 comments. A question. Does MOSA favor allowing  
10 100 percent liquid feeding to be certified  
11 organic?

12                   MS. ADAMS: In any specific  
13 production, --

14                   MR. THICKE: Well, across the board.  
15 I mean, in any case at all do they allow, would  
16 you be in favor of allowing 100 percent liquid  
17 feeding hydroponics?

18                   Q                   It's, I don't think that  
19 that's a sustainable approach for all production  
20 systems. But, you know, we don't have a super  
21 strong opinion. There are a couple of our  
22 hydroponics producers who are doing, who are

1 using all liquid feeding.

2 It doesn't make sense in all  
3 productions, though. And so, I think we always  
4 need to look at the production within the site  
5 specific conditions, and what makes sense.

6 MR. THICKE: Thank you.

7 MS. ADAMS: Yes.

8 MR. CHAPMAN: Harriet.

9 MS. BEHAR: Hi, Kristen. So, my  
10 question is, you mentioned that it would be  
11 burdensome record keeping to keep track of the  
12 nitrogen feeding.

13 But we were looking at, you know, the  
14 previous requirement, when sodium nitrates had  
15 that 20 percent. And I know that various  
16 certifiers worked out systems for that. I know  
17 someone who has helped train organic producers.  
18 We worked out systems for helping inspectors  
19 figure out how to do that.

20 And also, with the pasture regulation  
21 we have a fairly proscriptive requirement on the  
22 pastures. So, I'm just wondering, it may look

1 kind of burdensome now.

2 But do you think that MOSA could come  
3 up with some guidelines and some charts that  
4 would help people overcome that burden, and make  
5 this something that, as we do now with pasture.  
6 It's really become kind of almost second nature  
7 on organic inspection.

8 MS. ADAMS: Yes. Yes. Sorry if I  
9 wasn't clear. I didn't mean to say whether it's  
10 not possible. But the more records that we  
11 require be kept, of course that increases the  
12 complexity of the certification process, the  
13 timing, the expense to producers, you know.

14 And not saying that those tools could  
15 not be developed. Definitely we'd want some  
16 guidance from the Crop Committee, you know, ways  
17 of determining the specific nitrogen requirement  
18 for plants. And there are questions that remain  
19 to be answered. Does that answer your question,  
20 Harriet?

21 MS. BEHAR: Sure.

22 MS. ADAMS: Yes.

1 MR. CHAPMAN: Thank you. I also have  
2 a question from two last members. Hard to hear  
3 you. If you could speak up.

4 MS. BAIRD: Okay. Is that better?

5 MR. CHAPMAN: Yes. That's better.

6 MS. BAIRD: Okay. Have you seen  
7 CCOF's standards proposal?

8 MS. ADAMS: I am not familiar with all  
9 of the specifics of it. But am definitely more  
10 interested on, after hearing some of the comments  
11 today. So, for alternative labeling? Is that  
12 what you're --

13 MS. BAIRD: Yes. For the, for the  
14 container and their hydro certified piece.

15 MS. ADAMS: Okay. I'll take a look at  
16 it. I have become a little bit more familiar  
17 with some of their OSP requirements, and am  
18 definitely intrigued.

19 MS. BAIRD: Right. Have you developed  
20 your own standards that you're certifying your  
21 container and hydro, and/or aquaponic producers?

22 MS. ADAMS: Well, the standards that

1 we use are by USDA National Organic Standards.  
2 But we do have an internal organic system plan  
3 that's specific to greenhouse production,  
4 including aquaponic and hydroponic production,  
5 with robust questions about biodiversity, yes.

6 MS. BAIRD: Would you mind sharing  
7 those particular questions with the NOSB Board?

8 MS. ADAMS: I certainly can. I'll  
9 have a compliance and policy manager send those  
10 directly to you. And actually, Jackie just  
11 emailed me and said that our OSP is available  
12 online. So, I'll make sure that you have those  
13 connections too.

14 MS. BAIRD: Yes. Thank you.

15 MS. ADAMS: Okay, yes. You bet.

16 MR. CHAPMAN: Thank you, Sue. And I  
17 have a question from Asa.

18 MS. ADAMS: Okay.

19 MR. BRADMAN: Hi. No. Susan just  
20 asked it.

21 MR. CHAPMAN: Okay. All right. I  
22 think that's all of the questions I have. Thank

1 you, Kristen. UP next we have Damon Seawright.  
2 Damon, are you on the line?

3 MR. SEAWRIGHT: I am.

4 MR. CHAPMAN: Okay. Can you hold on  
5 one second? After Damon is Edwin Horton and then  
6 Eric Sideman. Damon you can start.

7 MR. SEAWRIGHT: Okay.

8 MR. CHAPMAN: Damon, if you could  
9 start with your name and affiliation for the  
10 record?

11 MR. SEAWRIGHT: Yes. I'm Damon  
12 Seawright, President of AmeriCulture,  
13 Incorporated.

14 MR. CHAPMAN: Great. And go ahead  
15 with your comment. If you could speak up a  
16 little bit, you're a bit light.

17 MR. SEAWRIGHT: Okay. My apologies.  
18 Yes. Our company has for 25 years worked on the  
19 development of an organic aquaponic production  
20 method. The method involves the modification of  
21 fish diets, so in way unrelated and unnecessary  
22 for the nutrition of fish, and exclusively for

1 the benefit of hydroponically grown plants.

2 Our aquaponic system holds a  
3 microbiome consisting of a wide variety of  
4 microorganisms, many of which play a crucial role  
5 in the breakdown of more complex molecules to  
6 those more suitable for plant nutrition.

7 The overall system biome goes beyond  
8 that of organic soil, in that it includes higher  
9 organisms. Bacterial nitrification not only  
10 benefits the health of fish, but converts the  
11 less suitable nitrogenous compound, ammonia, the  
12 more suitable nitrogenous compound, nitrate.

13 Without the contribution of the fish  
14 the plants would experience sub-optimal  
15 obligatory inorganic nutrition. And without the  
16 contribution of plants the fish would experience  
17 sub-optimal nutrient accumulation.

18 The impacts of the diverse soil like  
19 microbial community on root hairs was  
20 demonstrated in the study supported by a large  
21 inorganic NST hydroponic lettuce producer in  
22 Australia, and carried out by an Australian

1 scientists named Dr. Wilson Leonard.

2           The growth and quality of a variety of  
3 herbs and leafy greens were compared under  
4 inorganic hydroponic and aquaponic growing  
5 methods. As an example, the impact of aquaponics  
6 micro-biomes on plant performance, six out of  
7 seven lettuce varieties grown under aquaponic  
8 conditions outperformed those grown under  
9 inorganic hydroponic conditions, though the  
10 inorganic hydroponics was operated under ideal  
11 nutrient conditions.

12           Among the herbs, half of the herbs  
13 grown aquaponically exhibited higher growth  
14 rates. And nine out of ten herbs grown  
15 aquaponically were of higher quality.

16           And though not quantitative, yellow  
17 pest monitoring cards located among hydroponic  
18 and aquaponic canopies showed a lower level of  
19 pest infestation in the same greenhouse among the  
20 aquaponically grown plants, presumptively due to  
21 the higher health status in and from the  
22 aquaponic biome.

1 I would be glad to provide references  
2 at a later time. But several studies have been  
3 conducted on the microbial ecology and  
4 recirculating aquaculture systems that have  
5 demonstrated these systems are indeed extremely  
6 complex.

7 All plants, whether terrestrially  
8 grown or grown aquaponically or hydroponically,  
9 derive nutrients through an aqueous intermediary.  
10 The physical support provided by soil must  
11 necessarily be provided in aquaponics and  
12 hydroponics.

13 The microbiomes of aquaponic systems  
14 are complex, as they are in organic soil. The  
15 resulting growth, quality, and health of  
16 aquaponically grown plants are similar to those  
17 of grown organic crops.

18 The Organic Foods Production Act does  
19 not prohibit aquaponics or hydroponics. But they  
20 did say, and this discussion would not be taking  
21 place today. And the 50 plus organic hydroponic  
22 producers would not I think enjoy the benefit of

1 organic certification.

2 MR. CHAPMAN: Can you give me a --.

3 MR. SEAWRIGHT: The physical --

4 MR. CHAPMAN: I think I'm going to  
5 have to cut you off there.

6 MR. SEAWRIGHT: Okay.

7 MR. CHAPMAN: Any questions from the  
8 Board? And I'm not seeing any questions. Thank  
9 you for your comments. Now we'll move on to our  
10 next commenter. I have Edwin Horton, followed by  
11 Eric Sideman, and then Karen Archipley. Edwin,  
12 are you on the line? Edwin, I see you on the  
13 computer. I think I saw you. Yes. Are you  
14 possibly on mute right now?

15 MS. ARSENAULT: Yes. Edwin, it looks  
16 like you're using a headset, and maybe on mute.  
17 If you want to try to dial in I can, you can see  
18 the number on the screen.

19 MR. CHAPMAN: All right, Edwin, we're  
20 going to move on. But you get on, set up the  
21 message, and we'll come back to you. Eric  
22 Sideman, you're up next. And following Eric is

1 Karen Archipley, and then Colin Archipley. Eric  
2 are you --

3 MR. SIDEMAN: Yes, I man.

4 MR. CHAPMAN: Excellent, Eric. If you  
5 could start with your name and affiliation.

6 MR. SIDEMAN: I'm Eric Sideman. I  
7 work for the Maine Organic Farmers and Gardeners  
8 Association. I am their crop specialist. And  
9 I've worked for them for 30 years.

10 First of all I want to thank you all  
11 for being there. Pretty soon you on the NOSB are  
12 going to be where I am right now, feeling good  
13 about all the time I spent serving on the NOSB,  
14 and protecting the integrity of organic  
15 agriculture.

16 I was on the NOSB from 1997 to 2002.  
17 And I filled the scientist slot there. I was  
18 involved with organic agriculture long before  
19 that. I started working for MOFGA in 1986.

20 And when OFPA was first being formed  
21 MOFGA was playing a role. And there was  
22 discussion. And I have to admit I was very

1 nervous that the USDA is going to measure whether  
2 something was organic or not using a curve, or  
3 perhaps testing the soil for contaminants. But  
4 they didn't.

5 In the end they did surprisingly good  
6 job. I could even say a great job. The first  
7 thing that I note is they wrote a practice based  
8 standard. They didn't measure whether  
9 something's organic by the product itself, but by  
10 the practices that are on the farm. It's the  
11 practices that make the farm organic.

12 And number two, their standards were  
13 very consistent, well, this was considered  
14 organic then. And these principles are what  
15 organic was founded on.

16 I'm here today to support the Crops  
17 Subcommittee recommendation on hydroponic and  
18 container growing. I think they did a fabulous  
19 job of coming up with a great way of managing  
20 this very difficult situation.

21 Organic farming was founded on the  
22 practice of replenishing the soil. If you go

1 back to older history books, and the definition  
2 of what organic is, it is based around this idea  
3 of manuring the soil. Some people called it  
4 unifarming.

5 But for one way of looking at it, or  
6 another way of looking at it, what it really is  
7 based around is that the original farmers and  
8 mothers of organic farming recognized that  
9 farming degrades the soil. And that it's the  
10 practices of the farmer that has to replenish and  
11 build the soil.

12 That was the founding principle. Soil  
13 care is what makes the farm organic from the  
14 beginning. And OFPA mandates replenishing the  
15 soil. And the NOP regulation says the word must  
16 replenish the soil.

17 And the Crops Subcommittee  
18 recommendation is simply supporting this. One  
19 point that's bringing up a lot of comments is  
20 this idea that part of their recommendation is  
21 the idea of regulating soluble fertilizers. This  
22 precedent is actually set in the NOP regulations

1 of Chilean nitrate.

2 It's not so much that the highly  
3 soluble fertilizers are harmful. The reason they  
4 do it is because if a farmer becomes dependent on  
5 highly soluble fertilizers you can damage the  
6 primary force of fertilizer. And they're feeding  
7 the crop, and they are not meeting the  
8 requirement of OFPA or the rules, the founding  
9 principle to replenish the soil.

10 MR. CHAPMAN: Thank you, Eric. Any  
11 questions for Eric. I see a hand raised.  
12 Francis. Francis, if you're speaking, you're on  
13 mute. Then we'll come back to you Francis,  
14 because we're not hearing you. Asa, and then  
15 Terry.

16 MR. BRADMAN: Yes. I just have a few  
17 questions and comments. Well, not comments. But  
18 I just wanted to ask a few things. One, you  
19 know, you probably heard that there's, you know,  
20 people on, you know, on the exact opposite  
21 spectrum of what you're saying should be a  
22 limitation for organic.

1                   And I totally get your perspective.  
2           So, you know, I totally get that. I've talked to  
3           people now on all sides of the issue. And  
4           there's organizations with, you know, an  
5           extremely long history in organic, you know,  
6           dating back as far as Maine Organic Farmers  
7           Association.

8                   And I know people who date back that  
9           far who are also on both sides of this issue.  
10          And, you know, I tend to look for compromise.  
11          Maybe that's a personality trait.

12                   But, do you see any opportunity for  
13          compromise here? And it seems like one of the  
14          ones that's been suggested is the idea of a  
15          label. So, hydroponic or aquaponic would have a  
16          label.

17                   It could, would probably still be  
18          under the NOP. But there could be a  
19          distinguishment that would allow soil to stand  
20          alone. And perhaps, you know, I know there's  
21          talk of a regenerative agriculture label that,  
22          you know, people are working on.

1           And I just want to say that I think  
2           the people who are considering diversity in  
3           methods, nobody is anti-soil, and really support  
4           the kinds of things you're talking about. So  
5           anyway, just your perspective on that would be  
6           helpful.

7           MR. SIDEMAN: You're opening up a  
8           tremendous book. And I know no one wants me to  
9           spend the afternoon talking about this. First of  
10          all, I think the Crops Subcommittee  
11          recommendation is a compromise. What they are  
12          doing is writing standards to allow container  
13          production.

14          In my mind the original organic label  
15          was really about taking care of the farm.  
16          Building the soil in the farm, and protecting the  
17          farm from the degradation that happens when you  
18          grow crops. And container production wasn't even  
19          considered.

20          I think the Crops Subcommittee  
21          recommendation is opening the door to allow some  
22          container production to take place. The idea of

1 an extra label that you bring up makes me very  
2 nervous.

3 I think the marketplace is crowded  
4 already with labels that insinuate they're  
5 organic. I think what should be done is, labels  
6 should be very careful, and be honest and label  
7 what they are.

8 And the certifiers that are certifying  
9 hydroponics, I think it's because they're missing  
10 the boat. They're looking at organic meaning  
11 something that relates to clean and pure. And in  
12 some people's mind it does.

13 But historically speaking, and from  
14 the real foundation of organic production it  
15 relates to managing, management of the soil, not  
16 the cleanliness or the lack of contamination in  
17 the crop.

18 MR. CHAPMAN: Harriet.

19 MS. BEHAR: Hi, Eric. So, you know,  
20 we've heard a lot from people that soil based --

21 MR. CHAPMAN: Harriet, you're echoing.

22 MS. BEHAR: Oh. Is that better?

1 MR. CHAPMAN: Much.

2 MS. BEHAR: Okay. We've heard a lot  
3 that soil based, especially field grown  
4 agriculture is somewhat problematic, because our  
5 planet is not clean, it's --- actually, growing  
6 everything indoors, and kind of removing  
7 ourselves from the environment is really the  
8 future of food production. Because we are not  
9 going to have safe food otherwise.

10 And I'm just wondering if you see that  
11 somewhat differently. Can organic agriculture  
12 offer an alternative to that problem? Or are we  
13 just going to kind of lose our whole planet to  
14 conduct plant experiments?

15 MR. SIDEMAN: That's a good question.  
16 So, first of all I think we have to point out  
17 that there may be production systems that are  
18 even better than organic.

19 And I have, and I don't want to get  
20 into that argument. But my point would be that  
21 those production systems could really get on the  
22 bandwagon with their own label. And maybe they

1 could out beat organic in the marketplace.

2           These small scale organic farmers that  
3 began farming in the '80s worked really hard to  
4 develop their label, and make it valuable in the  
5 marketplace.

6           And I just don't think that somebody  
7 who thinks of themselves as better should come in  
8 and grab the established label. Let them start  
9 their own, and in their marketplace try to out  
10 compete organic, not try to usurp their label.

11           Getting to the point of whether  
12 organic is better for the land than conventional  
13 agriculture? I actually have this discussion a  
14 lot. There are very good conventional growers.  
15 And there are very bad organic --

16           MS. BEHAR: No. So --

17           MR. SIDEMAN: So, there's very good  
18 conventional growers, and very bad organic  
19 growers. And I think it really comes down to  
20 measuring the environmental impact of the farm,  
21 which has to do with nutrients crossing the  
22 boundary of the farm.

1           The organic standards that the NOP  
2 wrote try to manage the nutrients crossing the  
3 boundary of the barn, excuse me, the farm, and  
4 try to mandate through regulation that organic  
5 farmers use recycled nutrients, compost,  
6 instruments for cover cropping, and so on.

7           So, yes. Organic farmers can be much  
8 better at protecting the farm and the environment  
9 surrounding them, as can any farmer.

10           MR. CHAPMAN: Okay. We're getting a  
11 lot of feedback here from something. Francis,  
12 are you able to ask your question now?

13           MR. THICKE: Can you hear me?

14           MR. CHAPMAN: Yes, we can, Francis.  
15 We're here on the line.

16           MR. THICKE: Is that working now?

17           MR. CHAPMAN: Yes.

18           MR. THICKE: On and off. Okay.

19 Thanks, Eric. This, on the USDA hydroponic task  
20 force. I got a couple of questions to ask you  
21 on, relative to some of your recommendations.

22           And well, first of all, your, the

1 question has come up that it's difficult to  
2 calculate the 20 percent nitrogen requirement,  
3 and that it may be hard to determine the nitrogen  
4 requirement for crops. If you could hit that.

5 And also, Tuesday the hydroponics  
6 group said that if you put enough compost in a  
7 container to provide 50 percent of the crops'  
8 need, nitrogen needs, then it's not, it won't  
9 work. Because it will be toxic, or else you'll  
10 run out.

11 Can you address that? Are there  
12 people doing container growing with, using very  
13 little liquid feeding?

14 MR. SIDEMAN: Yes. Okay. I'll  
15 address both of those. So, oh, the first  
16 question just slipped my mind again. Oh, the 20  
17 percent nitrogen.

18 So, we actually work with that  
19 already, because we have growers who do use  
20 Chilean nitrate. And that is only supposed to  
21 allow 20 percent of the nitrogen requirement of  
22 the crop.

1                   What we do in our certification  
2                   program that I used to run, but don't anymore is,  
3                   we use textbooks, which is "Knott's Handbook for  
4                   Vegetable Crops". And we get from that, or other  
5                   university published information, what the  
6                   nitrogen requirement is for a particular crop.

7                   And then it's very easily, using  
8                   arithmetic to determine how much nitrogen is  
9                   provided by a certain amount of Chilean. And you  
10                  can come up with the maximum allowed. That does  
11                  not seem like a difficult situation at all.

12                 The second question, I have to  
13                 disagree with whoever said that it can't be done.  
14                 We actually certify some growers who do container  
15                 production. One of our best growers has a large  
16                 vegetable, mixed vegetable operation.

17                 For their very early season tomato  
18                 crop they have a large greenhouse. And because  
19                 they can warm the soil quicker, and maintain all  
20                 of the environmental parameters in the  
21                 greenhouse, usually they do their early season  
22                 tomatoes in five gallon containers.

1                   They're using a mixture of compost,  
2                   and certain feed meals, and alfalfa meal, and  
3                   having an analysis of the compost that could make  
4                   up any of the deficient nutrients.

5                   And depending on how your compost is  
6                   made, and the size of the bucket, and how much  
7                   production you want from the crop, this is  
8                   certainly possible to do.

9                   MR. THICKE: Thank you.

10                  MR. CHAPMAN: Thank you, Eric. I also  
11                  had two quick questions for you, and then we'll  
12                  have to move on. So now, I was a little  
13                  confused, because you started with your comments  
14                  saying that you were concerned with the FDA  
15                  measuring organic as a way to determine if  
16                  something was organic.

17                  Then you're supporting it like Crops  
18                  Subcommittee position that very much has to do  
19                  with measuring to determine whether something is  
20                  organic. And, you know, if I guess you could  
21                  explore that out a little bit more to help me  
22                  understand that.

1 MR. SIDEMAN: Sure. So, I was --

2 MR. CHAPMAN: And then --

3 MR. SIDEMAN: -- nervous about --

4 MR. CHAPMAN: -- ask one more on that.

5 I have one more on that. Before you get into  
6 that. And then, on that specific 20 percent  
7 content you talked a little bit about how you see  
8 the connection to the Chilean nitrate.

9 Then Chilean nitrate, it was in the  
10 National List where that restriction lived. And  
11 would you not see it as being appropriate  
12 position to restrict any sort of the materials  
13 that we wanted to, to similarly use the National  
14 List as the tool to restrict so it's fair across  
15 all types of operations.

16 MR. SIDEMAN: Boy, I hate getting two  
17 questions at once. So, let me do the second one,  
18 because that's the one I remember.

19 MR. CHAPMAN: Okay.

20 MR. SIDEMAN: Chilean nitrate, and  
21 some other highly soluble fertilizer are actually  
22 discussed in the preamble of the rule. And it

1 was actually an NOSB recommendation to deal with  
2 the highly soluble fertilizers through the  
3 National List.

4 The NOSB and those people talking  
5 about this subject at that time recognized that  
6 if people were using these highly soluble  
7 fertilizers they would be ignoring all of the  
8 soil building things. And essentially they'd be  
9 raising crops by fertilizing the crop, rather  
10 than feeding the soil.

11 And so, they wanted to regulate them.  
12 But there were just two of them. And it would be  
13 easy to handle them specifically in the list.  
14 What has changed is actually there are a handful  
15 of more. And I think a more highly soluble  
16 materials that are available.

17 And I think it's reached the point  
18 where this should actually be handled through  
19 rulemaking, and done in the text of the rule.  
20 Can you give me the first question again, because  
21 I forgot it.

22 MR. CHAPMAN: It was about measuring,

1 and measuring --

2 MR. SIDEMAN: Oh, yes.

3 MR. CHAPMAN: Your concern with --

4 MR. SIDEMAN: That's right. So, I poo  
5 pood the idea of measuring organic by sticking a  
6 probe in. I'm nervous that the USDA would look  
7 for pesticide residue, would try to figure out  
8 some way to determine whether a farmer was using  
9 chemical fertilizers by sticking a probe into the  
10 food.

11 And that actually is not that  
12 important. It wasn't where organic farming  
13 started. Organic farming started with the  
14 practices on the farm to replenish the soil,  
15 cover cropping, using crop residue, growing,  
16 using compost, growing legumes to get nitrogen.  
17 These are the practices that build the soil, fill  
18 the, feed the microorganisms in the soil.

19 And so, the Crops Subcommittee  
20 actually came up with basically the same idea,  
21 even though it is measuring. What it's measuring  
22 is the practice. It's not measuring the soil on

1 the farm and saying, yes, this is organic soil.  
2 Or measuring an orange and saying, yes, this is  
3 an organic orange.

4 Rather, what it's doing is looking at  
5 the practices on the farm, and trying to, through  
6 regulations, get the farmers to use what is best  
7 for the soil.

8 MR. CHAPMAN: Thank you, Eric.

9 MR. SIDEMAN: You're welcome.

10 MR. CHAPMAN: We have to move on now  
11 to other commenters. But thank you for fielding  
12 our questions.

13 MR. SIDEMAN: Thank you.

14 MR. CHAPMAN: So, up next I have Karen  
15 Archipley, followed by Colin Archipley. And  
16 after Colin is Roger Tambay. Karen, are you on  
17 the line with us?

18 MS. ARSENAULT: Sorry, I muted Karen.  
19 Hold on one second, Karen. I will unmute you.  
20 Or unless you just did yourself.

21 MS. ARCHIPLEY: What's that?

22 (Simultaneous speaking)

1 MS. ARSENAULT: All right. Thank you.

2 MR. CHAPMAN: And, Karen, if you could  
3 start with your name and affiliation?

4 MS. ARCHIPLEY: Sure. My name is  
5 Karen Archipley. And I'm the co-founder of  
6 Archi's Acres, as well as Archi's Institute for  
7 Sustainable Agrobusiness, in partnership with Cal  
8 Poly, Pomona.

9 And we teach beginning farmers, many  
10 just transitioning out of the military. But also  
11 civilians that wish to choose organic  
12 agrobusiness as a career.

13 Many of our students have gone on to  
14 start their own farms. And a large percentage  
15 have chosen containerized hydro-organic  
16 production, due to the non affordability of rural  
17 land, which is unobtainable by most, due to the  
18 limited financial resources.

19 And most would not be farming at all  
20 without the use of containerized production  
21 systems, due to productivity and limited space,  
22 and limited input. Many of whom also reside in

1 urban areas.

2 Science can show biological processes  
3 conducted in containers are equivalent to field  
4 production. There has been a lot of  
5 misinformation about the use of synthetic and  
6 inert inputs.

7 Any grower, in container or in the  
8 field, using these inputs described in the  
9 misinformation should be denied certification.  
10 And that process is already in place.

11 At Archi's Acres we've never used  
12 synthetic inputs, not even the ones that the NOSB  
13 has approved. No use of ozone, chlorine, or  
14 other chemicals that opponents have attempted to  
15 associate with our hydro-organic production  
16 systems.

17 It is our hope that you'll see through  
18 that misinformation, and instead take the time,  
19 which I'd really appreciate. I'm listening, and  
20 it seems that you are taking the time to research  
21 and understand the facts.

22 CCOF made a recommendation for

1 labeling. Let the consumer decide. We label  
2 ours as hydro-organic. And in our stores we have  
3 a large picture of our containerized production.  
4 And people love it. Because they know we're  
5 taking care of the land.

6           They know that our taking care of the  
7 land is giving it a rest. And that we are truly  
8 organic in our practices. We are organic  
9 consumers, my husband and I, as well as we're  
10 organic farmers. And we wouldn't feed someone  
11 something that we wouldn't eat.

12           So, we're in 2017. We should not be  
13 afraid of innovation. And we should not be  
14 supporting protectionism. So, hydro-organic is  
15 not new. It dates back to 600 BC. And the  
16 concern is from the growers, really a handful of  
17 growers, not from the consumers.

18           And so I say, let's embrace this next  
19 generation of organic growers, and not turn them  
20 off with inappropriate use of protectionism. And  
21 that's what I hear.

22           And I'll tell you, taking care of the

1 land, we say, give us your worst land. And  
2 you're looking at places like Houston, where you  
3 don't even know what chemicals are in that land.

4 Yet, we can send a grower over there  
5 to actually set up hydro-organic production, and  
6 be feeding that community affordably. And I just  
7 think that we really need to be mindful. So,  
8 thank you. Thank you for your time.

9 MR. CHAPMAN: Thank you. Any  
10 questions for Karen? Ashley.

11 MS. SWAFFAR: Hi, Karen. Thank you  
12 for your comments. Just one very, if you know.  
13 How many items are on your material input list  
14 for your organic system plan?

15 MS. ARCHIPLEY: You know what, my  
16 husband is on next. And he's the one that fills  
17 out that plan.

18 MS. SWAFFAR: I will, I'll ask him  
19 then. Thank you.

20 MS. ARCHIPLEY: Yes. He will be  
21 specific.

22 MR. CHAPMAN: Harriet? Harriet, I

1 think you're on mute. Give me a second.

2 MS. BEHAR: Yes.

3 MR. CHAPMAN: Okay.

4 MS. BEHAR: Karen, could the  
5 containers that you currently use, could you  
6 follow the proposal of the subcommittee to manage  
7 your containers that way?

8 MS. ARCHIPLEY: Are you talking about  
9 the proposal where you want us to add soil, and  
10 things like that?

11 MS. BEHAR: No. The proposal is  
12 managing the amount of nitrogen in the container  
13 at planting, and then the additional nitrogen  
14 added.

15 MS. ARCHIPLEY: You know what, that  
16 again I'm going to let my husband answer that.  
17 Because I can't give you a specific. I can tell  
18 you that we measure all day. I mean, we are  
19 always watching what, how our system is reacting.

20 And I know that we have a lot of  
21 biological, like we have a lot of frogs in our  
22 system. And those are both in our NFT channels,

1 as well as you'll see them around the farm. And  
2 so, to me it's a good sign. We have a lot of  
3 biodiversity. But I'll let Colin answer the  
4 question specifically about measurements.

5 MS. BEHAR: Okay. So, yes. It  
6 relates back to the proposal that we are going to  
7 discuss and vote upon in general.

8 MS. ARCHIPLEY: Right.

9 MS. BEHAR: Okay.

10 MS. ARCHIPLEY: Appreciate that.

11 MR. CHAPMAN: Steve.

12 MR. ELA: I just want to follow-up.  
13 Early on you talked, you said science. There's,  
14 I take the comment to paraphrase, and I may not  
15 get it quite right. Science has demonstrated the  
16 equivalent biodiversity of hydroponic and soil  
17 systems. Have you submitted those science --

18 MS. ARCHIPLEY: You know what, I know  
19 they've been submitted. And several other  
20 people, I've heard them also referenced. But I  
21 can have that sent to you. No problem.

22 MR. ELA: Yes. It's something to be

1       sure. I mean, part of it is, I think it's been a  
2       broad brush, where we've seen, I mean, there are  
3       reports of biological activities. But it's often  
4       hard to find that those, you now, equivalent  
5       studies. So, I think anything you can submit  
6       would be appreciated.

7                   MS. ARCHIPLEY: More than happy to.  
8       Not a problem.

9                   MR. CHAPMAN: Thank you, Karen. Well,  
10       that looks like all the questions I have. And I  
11       will move on to Colin. After Colin we're going  
12       to jump back up to Edwin, who we believe is now  
13       on the line. And then follow on with Roger  
14       Tambay. All right. Colin, if you could start  
15       with your name and affiliation for the record?

16                   MR. ARCHIPLEY: My name's Colin  
17       Archipley with, co-founder and grower at Archi's  
18       Acres.

19                   MR. CHAPMAN: Go ahead, Colin.

20                   MR. ARCHIPLEY: Okay. Thank you.  
21       Obviously I'm a proponent of containerized module  
22       certification. And as opposed to telling you a

1 lot of stuff you already heard today, there's  
2 been a lot of people on saying all the great  
3 things on it, I just want to address a few  
4 things, particularly before the commenter, a few  
5 calls ago said.

6 And that, starting with OFPA. And the  
7 commenter is correct in regards to OFPA  
8 addressing soil specifically. But any legal  
9 advisor would also clearly state that OFPA wasn't  
10 meant to be absolute.

11 It clearly states, and I'm  
12 paraphrasing here, that if certain application of  
13 OFPA don't apply to a particular business or  
14 farm, then that doesn't preclude them becoming  
15 certified organic.

16 That's why we have soap manufacturers  
17 who have nothing to do with soil becoming  
18 certified organic. Because OFPA is not absolute.

19 Secondly, the idea that these types of  
20 systems popped up out of nowhere in the last few  
21 years, and is something that we just have to  
22 address recently is hilarious.

1                   And the idea of it is, this has  
2 brought, this talk has been done on four separate  
3 occasions, never more in depth after 2010, but  
4 before the 2010 recommendation it was brought up  
5 three separate times.

6                   And we've had hydroponic growers  
7 certified for 20 plus years. Our farm has been  
8 certified organic now for over ten years.

9                   There's also a belief that the vast  
10 majority of hydroponic and aquaponic growers are  
11 large scale, and large corporate agrobusiness  
12 type operations. The vast majority of hydro-  
13 organic aquaponic growers are mom and pop small  
14 business who are doing this because they believe  
15 they're doing the right thing, and doing it  
16 because the consumer's demand they do it.

17                   They're doing it because they're out  
18 of water, natural resources, doing it because of  
19 labor, and all the other reasons. So, just keep  
20 in mind that we're not talking about a select few  
21 tomato growers under attack.

22                   And I know there's the thing about the

1 organic industry. And when people become  
2 successful all turn their backs. But keep in  
3 mind, if you ban certified organics in these type  
4 of systems it's going to be small scale growers  
5 who will be impacted the most.

6 There's also been a discussion about  
7 energy use. And we looked at a greenhouse with  
8 hydroponics and see water pumps. And the  
9 assumption is there's a lot of energy being used.

10 But if you're comparing energy use on  
11 the acre by acre basis, and you're not actually  
12 looking at how much energy it takes to produce a  
13 plant. And you could actually look at these  
14 productions.

15 And you break down carbon input to  
16 produce one unit, a head of lettuce, whatever  
17 that is, you're going to realize that hydroponic  
18 systems and aquaponic systems are far more energy  
19 independent, as well as water independent, and  
20 other resources, than the vast majority of  
21 standard organic farms.

22 Lastly, there was a good discussion

1 about the use of mycorrhiza and that, and  
2 hydroponic systems. Karen just mentioned that  
3 she could send you some of those studies. So,  
4 I'll leave it at that.

5 I do have some concepts about these  
6 relationships, about this fusion, if you will,  
7 between the plant, and so forth. I know that's  
8 the alarm.

9 I would just like to point out there  
10 has been no study, no study that said the absence  
11 of the soil particle will preclude the processes,  
12 these organisms from surviving. In fact, the  
13 opposite is true.

14 MR. CHAPMAN: Thank --

15 MR. ARCHIPLEY: Thank you.

16 MR. CHAPMAN: Thank you, Colin. I  
17 have a question from Ashley.

18 MS. SWAFFAR: Hi, Colin. Can you  
19 answer my earlier question? Do you know how many  
20 items are on your material input list?

21 MR. ARCHIPLEY: Yes. You're looking  
22 for a utility. I don't --- a tool, or all of the

1 above?

2 MS. SWAFFAR: Yes. Like how many  
3 items do you have on your material input list,  
4 like in your organic system plan?

5 MR. ARCHIPLEY: Oh, okay. That  
6 includes like media and pest control, and our  
7 ingredients for our organic tea, and stuff like  
8 that. So, I'd probably say we have about two  
9 dozen items on there, primarily because we don't  
10 remove items once we quit using them.

11 So, but on a day to day basis, and on  
12 an annual basis we have seven fertility inputs we  
13 use, a few other pest control inputs, and two or  
14 three different types of media we may use in a  
15 given year.

16 MS. SWAFFAR: Thank you.

17 MR. CHAPMAN: Harriet.

18 MS. BEHAR: Yes. So, the Crops  
19 Subcommittee has a proposal that we'll be  
20 reviewing and voting upon, which ties the  
21 definition of hydroponics to the amount of  
22 nitrogen in the container, and then additional

1 nitrogen added.

2 I'm wondering if your containers can  
3 currently, or could in the future meet that  
4 requirement, and therefore, then be not  
5 considered hydroponics?

6 MR. ARCHIPLEY: It's hard for me to  
7 answer that question, not having the ability to  
8 measure how much solubilized nitrogen, for  
9 instance, is in our system at any given time.

10 What I can tell you is we've had  
11 studies done, or lab tests done about the  
12 availability of solubilizing nitrogen,  
13 specifically, in our inputs. And those studies  
14 come back --- as you add them to our production  
15 system the availability of solubilized nitrogen  
16 is extremely low. Meaning there is nitrogen in  
17 the product that's insoluble, and it has to be  
18 released through biological digestion. And we  
19 know that occurs because the output of the  
20 production system is greens to greens, right.

21 So, we know nitrogen is being,  
22 insoluble nitrogen is being broken down and

1 converted, and so forth. And the studies show  
2 that before those inputs are added to these  
3 production systems the levels of insoluble  
4 nitrogen is much higher than insoluble, or  
5 solubilized nitrogen.

6 Furthermore, I think there needs to be  
7 a clarification between liquid nutrients and  
8 solubilized nitrogen. They're two different  
9 things.

10 You can add a fish emulsion that's  
11 high in insoluble nitrogen, that's liquid and  
12 very low soluble nitrogen. So its breakdown,  
13 it's conversion -- for example, is extremely  
14 similar, although it looks like it's in liquid  
15 form.

16 MR. CHAPMAN: Francis.

17 MR. THICKE: Yes. Could you tell me,  
18 a question I've been asking other people, what  
19 you use for a medium or substrate? And what  
20 percent of the nitrogen would you say comes from  
21 a liquid feed, soluble or insoluble?

22 MR. ARCHIPLEY: Well again, the lab

1 tests usually show that we have extremely low  
2 solubilized nitrogen adding it to the production  
3 system, and it's extremely low. Less than one  
4 percent of what we're applying is solubilized  
5 nitrogen.

6 The type of media that we use, we use  
7 a generic compost based, peat moss based potting  
8 media that you find in any type of nursery crop.  
9 We also use various forms or volcanic rock,  
10 vermiculite.

11 In our specific production system we  
12 use, we can utilize a wide variety of media.  
13 Some, again, compost, peat moss are required to -  
14 - they're off the ground. We just go with what  
15 seems to be fine, that works better, and what can  
16 be more available and cost effective.

17 MR. THICKE: What I asked though first  
18 was, what percent of the nitrogen comes in liquid  
19 form, whether it's soluble or mixed in a  
20 suspension, for a cup of single liquid  
21 application?

22 MR. ARCHIPLEY: Oh, I'm sorry. So,

1 when we start the plug at zero, we add zero  
2 liquid form of nutrients. Then we transplant the  
3 plug after about three weeks into the system.  
4 With a majority, if not all, well, the majority  
5 of fertility is coming through the irrigation  
6 system.

7 MR. THICKE: Okay, thank you.

8 MR. CHAPMAN: Thank you, Colin. I'm  
9 not seeing any other questions at this time. And  
10 I appreciate it, Colin.

11 MR. ARCHIPLEY: All right. Thank you.  
12 Appreciate it.

13 MR. CHAPMAN: Up next we have Edwin  
14 Horton. Edwin, are you on the line now?

15 MR. HORTON: Yes. Can you guys hear  
16 me?

17 MR. CHAPMAN: Yes, I can Edwin. And  
18 hold on one second. After that one we have Roger  
19 Tambay, and then Jaydee Hanson. Edwin, you can  
20 start with your name and affiliation.

21 MR. HORTON: Thank you. My name is  
22 Edwin Horton, and I'm a ranch manager with Reiter

1 Brothers. And I would like to address the  
2 current Crops Subcommittee proposal on container  
3 production.

4 I'm addressing this proposal, because  
5 I have many questions and concerns about it.  
6 Honestly, I have more questions than answers on  
7 how this would actually affect my business.

8 I manage a 200 acre organic container  
9 operation of blackberries and blueberries. This  
10 proposal would require me to apply 50 percent of  
11 the total year's nitrogen requirement by the  
12 first planting day.

13 This is excessive and wasteful, and  
14 likely harmful to the establishment of a young  
15 plant. This is like the same thing as taking an  
16 infant to an all you can eat buffet. It is an  
17 excessive amount of food for a baby, who will  
18 probably waste it all, and/or get very sick if  
19 you force feed it.

20 So, if the plant survives  
21 establishment, then I can apply an additional 20  
22 percent through the drip system, and top dress

1 the remaining 30 percent. And this is only in  
2 year one. I haven't even begun to harvest the  
3 crop yet.

4 And during fruit development it is the  
5 majority of the plant's nutrient uptake. So, why  
6 would the Board require me to be so wasteful with  
7 early nitrogen over applications, if nitrogen can  
8 be so harmful to the environment and to human  
9 health?

10 As a new young farmer this is very  
11 meaningful to me. And I would like to produce  
12 high quality organic food, while decreasing the  
13 harm to the environment.

14 My fertility program usually consists  
15 of solid fertility mixed in at the planting, and  
16 perhaps less than ten percent of the plant's  
17 needs, because of the small requirement of the  
18 young plant.

19 Then I apply liquid fertilizer,  
20 organic matter, microbes, and compost through the  
21 drip system. We will also apply a top dressing  
22 application at critical times for plant nutrient

1 updates.

2 Top dressing applications in the pots  
3 are actually particularly costly, because there's  
4 no mechanical operation for this right now. Not  
5 to mention, the cost of labor is significantly  
6 increasing in California. And our availability  
7 of labor is significantly decreasing due to  
8 recent legislations.

9 For my business to be viable I need to  
10 be able to keep the same plants for at least six  
11 years. This proposal does not really take into  
12 account how perennial plant growers will be able  
13 to manager their nutrition after the first year.  
14 The fertility in these years are most critical to  
15 me as a perennial plant grower to grow, build,  
16 and establish healthy plants.

17 In particular, this section of the  
18 proposal needs to be worked on more. It said the  
19 requirements of perennials is recalculated on an  
20 annual basis. So, does this mean that I have to  
21 top dress 80 percent of the nitrogen? Or repot  
22 the plants every year afterwards?

1                   This would greatly increase the cost  
2 and complexity of the operation, and likely  
3 exclude most perennial operations from this  
4 organic requirement. Also, how would these be  
5 regulated? Does the burden of all this complex  
6 records fall on the grower?

7                   I urge the Board to vote no on this  
8 proposal, and send it back to the Subcommittee to  
9 allow for more focus on these critical components  
10 of the proposal. I would like to thank the Board  
11 for their service. And I am happy to answer any  
12 questions you might have for me.

13                  MR. CHAPMAN: Thank you. I have a  
14 question from Francis, and then Ashley, maybe  
15 Ashley. Francis, go ahead.

16                  MR. THICKE: Okay. Thanks for your  
17 comments. I think that as a member of the Crops  
18 Subcommittee I should answer a question that  
19 several hydroponic growers have asked. And that  
20 is, why would we require the nitrogen requirement  
21 we have in the proposal?

22                  And it's because we are looking for a

1 container system that will work like a soil.  
2 That will either be soil, or a compost based  
3 system that will work like a soil, as Eric  
4 Sideman said, that will feed the plants.

5 And so, you have a system that can  
6 provide nitrogens not as soluble, or various  
7 highly labile nitrogen forms, but as a more mix  
8 of different nitrogen forms that are present in  
9 soils, and can over time provide the nutrition  
10 for a plant.

11 So, I can understand that when you  
12 have a hydroponic system it's not workable.  
13 Because you can't apply a soil system concept to  
14 a hydroponic system. So, we just need to be  
15 clear. So, I'm sorry I don't have a question.  
16 But that's what I wanted to say.

17 MR. HORTON: Yes. I have a question  
18 to that. What kind of crops would they be  
19 considered as? Because as we know for fruiting  
20 crops, crops such as berries, they go through  
21 different nitrogen requirements throughout  
22 various stages of their lives, especially

1 perennial crops. Could you touch on that?

2 MR. THICKE: Yes. There actually are  
3 tables. In this proposal we talked about some of  
4 those things, where you can, as Eric Sideman  
5 mentioned, there's not a handbook of mutual  
6 requirements for plants.

7 So, a lot of these recommendations are  
8 maybe like five pounds of nitrogen per ton of  
9 yield, something like that. These are guidelines  
10 that come from university research and such.

11 So, those guidelines are out there.  
12 And they're pretty straightforward for what is a  
13 requirement, nitrogen requirement for plants.

14 MR. CHAPMAN: Thank you, Francis. I  
15 have a question from Steve.

16 MR. ELA: I'm curious. So, in the  
17 soil system growing the same plants you're  
18 growing, that nitrogen level is manipulated, you  
19 know. We as growers manipulate them to provide  
20 the optimal nitrogen, you know, at the various  
21 times for our plants.

22 So, what was, I mean, I heard you say

1 labor, because in containers you can't use a  
2 mechanical applicator. And honestly, I mean, I  
3 work in a system that requires tons of labor as  
4 well. And I get that stress. But OFPA doesn't  
5 put labor in our standards. You know, it looks  
6 more at other things.

7 So, what are the barriers to provide,  
8 to manipulating the, you know, other than labor,  
9 your soil system, or your media system in your  
10 containers, you know, via physical nitrogen  
11 inputs versus liquid ones?

12 MR. HORTON: Can you restate the  
13 question? I'm sorry. I'm a little confused.

14 MR. ELA: Well, I guess in the soil  
15 system if we grow the same crops that you're  
16 growing, that nitrogen need for the crop, you  
17 know, as you said, goes up and down depending on  
18 the year and the stage of growth.

19 In that soil system we moderate that  
20 nitrogen to meet that crop need. And what I, and  
21 I'm not clear of why, what the barrier is to you  
22 to do the same thing. I heard labor. But

1 really, we can't consider labor that, it's not  
2 part of the OFPA rules.

3           What are the other barriers for you to  
4 manipulate your nitrogen level in your plants  
5 with a non liquid material, versus a liquid  
6 material that, other than labor?

7           MR. HORTON: Well, we grow in a very  
8 similar way as soil growers do. And to my  
9 knowledge soil growers are actually not required  
10 to apply 50 percent of their nitrogen requirement  
11 at planting. Also, with soil you guys have a lot  
12 more surface area, and/or buffer zone to deal  
13 with. Does that answer your question?

14           MR. ELA: Yes. I mean, like, you've  
15 heard from growers that do use a system where  
16 they're manipulated without liquid feeding. And  
17 we've heard from many growers that say it's  
18 impossible to do that. And so, I'm trying to  
19 parse out what the differences are, what the  
20 barriers are.

21           MR. HORTON: Well, I mean, if I were  
22 to grow a soil, personally, I would not need the

1 50 percent. And that would have definitely  
2 provided help throughout the year.

3 But, you know, we're talking to be  
4 quite specific on, you know, soil type,  
5 environment, plant type, the plant year, the  
6 plant structure. You know, there's very many  
7 things that go into it.

8 But I just don't see using 50 percent  
9 at planting applicable. And therefore, actually  
10 detrimental to the plants then, you know, doing  
11 this in a soil would also just accumulate a lot  
12 of nitrates, which is just incredibly bad for the  
13 environment. And personally I thought we were  
14 trying to steer away from that as organic  
15 growers.

16 MR. ELA: And we've had some comments  
17 from people in the past about using different  
18 compost mix, with more, you know, where the  
19 nitrogen release is much, much longer term.  
20 Would that be a possibility?

21 MR. HORTON: Compost definitely helps.  
22 Obviously they assist in some microbes. I mean,

1 no matter which way that you give the plant  
2 nitrogen it's got to go through the  
3 nitrification. And the plant's got to actually  
4 break down those enzymes to make it acceptable  
5 for it.

6 So, I will say, yes, the additional  
7 compost would definitely help aid in the uptake  
8 of nitrogen. I don't know if it's needed, per  
9 se. But it's definitely aiding.

10 MR. CHAPMAN: Edwin, you dropped off  
11 there. Are you still there?

12 MR. HORTON: Can you hear me now?

13 MR. CHAPMAN: Yes. It was at the very  
14 end.

15 MR. HORTON: Oh, I'm sorry. No. I  
16 would just say that compost does help aid in  
17 starting the breakdown of the nitrification  
18 process. That plants need to uptake nitrogen.

19 Do I think it's necessary? Not per  
20 se. But I think there's natural organic composts  
21 that we don't actually apply in soil and in  
22 containers year round.

1 MR. CHAPMAN: All right. Thank you  
2 for your time. And thank the Board for the  
3 questions. We're going to have to move on now.  
4 We're about ten minutes behind.

5 Our next speaker is Roger Tambay,  
6 followed by Jaydee Hanson, and then Mark Ellis.  
7 Roger, are you on the line with us?

8 MR. TAMBAY: Yes, I am.

9 MR. CHAPMAN: Go ahead, Roger. Start  
10 with your name and affiliation.

11 MR. TAMBAY: My name is Roger Tambay.  
12 And thank you for the opportunity to present the  
13 mulch film manufacturers' point of view at this  
14 forum. I will deal with Conditions 2 and 3 of  
15 Memo 15-1, mulch film testing compliance for  
16 composting and soil biodegradability.

17 Film Organic creates recipes and sells  
18 soil biodegradable mulch films. It's all we do.  
19 Mulches are creep crop region soil type specific.  
20 And sometimes they are grower specific. Slide.

21 Soil biodegradable mulch film benefits  
22 growers. It's a weed control tool. It can free

1 up labor, and can help reduce costs of produce.  
2 slide.

3 Film Organic's mission is to replace  
4 polyethylene based mulch film with soil  
5 biodegradable mulch film. Slide.

6 Question. Is it possible to make a  
7 soil biodegradable mulch film with bioplastics  
8 that are made only from modern carbon, not the  
9 issue of genetic engineering, contain zero  
10 percent petroleum bioplastic, meets composting  
11 and soil biodegradation standards at a reasonable  
12 cost as compared to alternatives? Slide. The  
13 answer is yes. This photo was taken 60 days  
14 after the mulch film was installed. Slide.

15 There are some conditions for a  
16 successful soil biodegradable mulch film. It  
17 must meet regulatory requirements. It must  
18 perform technically. And it's got to be  
19 reasonably priced. Slide.

20 The problem is that according to  
21 Conditions 1 and 2 of Memo 15-1, the mulch film  
22 must meet ASTM D6400 for compostability, at a

1 cost of \$10,000 dollars. And in requirement 2  
2 the film must demonstrate at least nine percent  
3 biodegradation, at a cost of \$25,000 dollars.  
4 Slide.

5 We use biopolymers, or biopolymer  
6 mixtures, and only perform physical blending. If  
7 these comply, the mulch film complies. Slide.

8 So what? Based on our experience  
9 we'll need about ten recipe thickness  
10 combinations, costing potentially hundreds of  
11 thousands of dollars for compliance testing.  
12 Here is why. Slide.

13 Grower collaboration is required to  
14 get the right performance. Soil type, short  
15 crops versus long crops, grower practices,  
16 location, Washington State versus Florida,  
17 growers' cost expectations. Slide.

18 Each of these recipe thickness  
19 combinations require testing at a cost of \$35,000  
20 dollars each. The costs can add up to a lot of  
21 money. Slide.

22 Testing mulch film stifles innovation.

1 Slide. Here is one suggestion. All biopolymers  
2 or biopolymer mixtures must comply with ASMD  
3 D6400. Slide. And ASTM D5988. Slide.

4 You can encourage innovation in our  
5 industry by allowing us to use approved  
6 biopolymers and biopolymer mixtures. We can  
7 focus on creating film the growers will  
8 appreciate.

9 That helps us avoid expensive  
10 compliance testing, and in the end helps growers  
11 reap the benefits associated with soil  
12 biodegradable films. And makes organic farming  
13 more accessible. Thank you.

14 MR. CHAPMAN: Thank you. Even though  
15 we're running behind let's try to keep questions  
16 and answers specific. I have two questions.  
17 First one's from Harriet. I'll take questions.  
18 First one's from Harriet.

19 MS. BEHAR: Hi. Is your biopolymer  
20 like corn based? Or what is the base of that  
21 polymer? Because you said it's not petroleum  
22 based.

1 MR. TAMBAY: Right. It's not  
2 petroleum based. It's different sources of  
3 sugar, whether they be from corn or other sugar  
4 sources.

5 MS. BEHAR: Thank you.

6 MR. CHAPMAN: Emily.

7 MS. OAKLEY: Oh, that was for the  
8 previous speaker. I don't have a question for  
9 this speaker. Thank you.

10 MR. CHAPMAN: Thank you. Asa.

11 MR. BRADMAN: I'd like to get more  
12 information on this. And again, just verify this  
13 is 100 percent, like you said, modern carbon.  
14 And then also, you talked about 90 percent  
15 biodegradable, and then a percentage that was  
16 microcrystalline. Could you explain that a  
17 little bit more, those two sectors, those two  
18 components?

19 MR. TAMBAY: There are two ASTM tests  
20 that are listed in the memo. The first one is  
21 D6400. It requires for composting in a  
22 composting environment. And D5988 requires for

1 biodegradation.

2 And the standard requires 90 percent  
3 biodegradation as compared to cellulose. So,  
4 those are listed in the memo. And the ASTM  
5 methods are the ones that are prescribed therein.  
6 That's why, I was merely restating what those  
7 are.

8 MR. BRADMAN: Right. But wouldn't  
9 ultimately the cellulose break down as well?

10 MR. TAMBAY: Yes. But I think the  
11 issue is not, it is, cellulose is the reference.  
12 And so, the test requires for the material to  
13 break down at least 90 percent as well as  
14 cellulose.

15 MR. BRADMAN: I think --

16 MR. TAMBAY: Right.

17 MR. BRADMAN: I think I got it. I'm  
18 certainly interested in getting more information  
19 on it.

20 MR. TAMBAY: Okay.

21 MR. CHAPMAN: Yes, Mark. He says that  
22 he can provide that to you and Michelle.

1 MR. TAMBAY: Okay.

2 MR. BRADMAN: And one last question  
3 I'd also like to get is the different weights per  
4 meter of film. You can, you have different  
5 materials or thicknesses. If you could give us,  
6 give me like the range for different products,  
7 that would be great. So, it would be the, is it  
8 grams or milligrams per square meter in mass?

9 MR. TAMBAY: Sure. I'd be happy to.  
10 But it also depends on, there's several factors  
11 that will affect the thickness and the recipe.  
12 Because it's not only the thickness. And I've  
13 listed some of those, mainly the location, the  
14 soil type, how fast we want the film to degrade,  
15 or how long do we want it to last. And then  
16 there could be some finer differences as well, in  
17 terms of how certain growers might cultivate,  
18 versus others.

19 MR. BRADMAN: Right.

20 MR. TAMBAY: And all of those make  
21 differences in terms of how we end up  
22 collaborating with nature to have our films last

1 just the right amount of time.

2 MR. BRADMAN: All right. Well, again,  
3 if I can get --

4 MR. CHAPMAN: All right. I think he  
5 broke up a little bit. Asa?

6 MR. BRADMAN: I'm done. Thanks.

7 MR. CHAPMAN: You broke up there. We  
8 didn't hear you a little bit.

9 MR. BRADMAN: Which is, I just wanted  
10 to verify that I'm really interested in getting  
11 the weight on an area basis --

12 MR. TAMBAY: Okay.

13 MR. BRADMAN: -- for different  
14 materials. That would be great.

15 MR. TAMBAY: Yes. We'll supply them.

16 MR. BRADMAN: Thanks.

17 MR. TAMBAY: You're welcome. Thank  
18 you.

19 MR. CHAPMAN: Thank you, Roger. Up  
20 next I have Jaydee Hanson, followed by Mark Ellis  
21 and Aviva Glaser. Jaydee, are you on the line  
22 with us?

1 MR. HANSON: I am on line. Can you  
2 hear me?

3 MR. CHAPMAN: Yes, we can. You can  
4 start with your name and affiliation.

5 MR. HANSON: I'm Jaydee Hanson, Senior  
6 Policy Analyst for Emerging Technology at the  
7 Center for Food Safety. And I'm in their  
8 Washington, DC office. And you heard my  
9 colleague and one of our consulting scientists,  
10 Marti Crouch earlier.

11 I'm speaking on three techniques.  
12 I'll just go right into them. Intergenes is a  
13 technique that involves the genetic engineering  
14 of a recipient plant with genes from crossable  
15 species.

16 It is a plant that is genetically  
17 engineered with various plant DNA, all of which  
18 come from varieties of the plant, or sexually  
19 compatible relatives, that are combined into the  
20 genetic material, and inserted into the genome.

21 Intergenes best results in a novel  
22 gene, and carries risks associated with other

1 genetic engineering methods, and should be an  
2 excluded method itself. We already have some  
3 fruits and potatoes coming to the market using  
4 this method.

5 Agro infiltration is a method of  
6 introducing nucleic acids into plant tissues  
7 using agro bacterium vectors in order to produce  
8 specific foreign proteins within the plants, such  
9 as pharmaceuticals.

10 In agro infiltration in vitro nucleic  
11 acids are introduced to plant leaves to be  
12 infiltrated into them. Thus, agro infiltration  
13 is clearly an in vitro nucleic acid technique and  
14 falls under the definition of modern  
15 biotechnology, and should be excluded.

16 Transposons are naturally occurring  
17 mobile genetic elements. And they should be  
18 excluded when they're used to genetically  
19 engineer plants and animals.

20 And they are discrete bits of DNA,  
21 with the ability to change their condition within  
22 the genome, using a cut and paste mechanism

1 called transposition.

2 And thus, can be engineered as  
3 vectors, removing other pieces of DNA into the  
4 recipient organisms, and for causing insertional  
5 mutations. Using transposons vector or mutagens  
6 clearly means they are excluded methods.

7 As previously commented by CFS,  
8 transposons by themselves are not breeding or a  
9 biotechnology method, though they may be used as  
10 a genetic engineering techniques. As such, we  
11 recommend that NOSB amend the term in the  
12 terminology chart to use of transposons in  
13 genetic engineering. Okay. Well, I'll stop  
14 there. Thank you.

15 MR. CHAPMAN: Okay, are there any --  
16 I have a question from Harriet. And again, we're  
17 behind schedule. So, I have a reminder to keep  
18 it brief.

19 MR. HANSON: Sure.

20 MR. CHAPMAN: Harriet.

21 MS. BEHAR: That was for the previous.

22 But I want to say thank you to Jaydee for all

1 your help.

2 MR. HANSON: Well, thanks. And thank  
3 you for your input in these discussions and  
4 others. I'm pretty sure there's a lot. Thank  
5 you.

6 MR. CHAPMAN: Thank you. All right.  
7 Up next we have Mark Ellis, followed by Aviva  
8 Glaser, and then Dan Martens after that. Mark  
9 are you with us?

10 MR. ELLIS: Yes. Can you hear me?

11 MR. CHAPMAN: Yes, we can. And, Mark,  
12 if you could start with your name and  
13 affiliation, and then go into your comment.

14 MR. ELLIS: Sure. Thanks. Good  
15 afternoon. I'm Mark Ellis, and I serve as  
16 Executive Director of the International Diatomite  
17 Producers Association, or IDPA. IDPA is an  
18 industrial trade association that represents  
19 producers of diatomaceous earth products.

20 Diatomaceous earth is a sedimentary,  
21 non-metallic mineral composed of the skeletal  
22 remains of plant based plankton called diatoms.

1 Diatomaceous earth is predominantly amorphous  
2 silica.

3 I speak to you today in support of the  
4 recommendation of the NOSB Handling Subcommittee  
5 to retain diatomaceous earth on a national list  
6 on allowed and prohibited substances.

7 Diatomaceous earth has been considered  
8 generally recognized as safe since 1963 by the  
9 U.S. Food and Drug Administration for use as a  
10 filter aid.

11 In 1979 the Food and Drug  
12 Administration Select Committee on grass  
13 substances concluded that there was no evidence  
14 that demonstrated or suggested diatomaceous earth  
15 presented a hazard to the public when used as a  
16 filter aid.

17 In 1983 the Food and Drug  
18 Administration again concluded that diatomaceous  
19 earth is generally recognized as safe for use as  
20 a filter aid. In 2002 the Food and Drug  
21 Administration again concluded that diatomaceous  
22 earth remains generally recognized as safe.

1           The NOSB reviewed diatomaceous earth  
2           in 2005, 2010, and 2015, and recommended re-  
3           listing each time.

4           The diatomaceous earth produced by the  
5           three major diatomaceous earth producers in the  
6           United States complies with U.S. Pharmacopeia  
7           Food Chemicals Codes purity requirements for  
8           diatomaceous earth. This monograph includes  
9           heavy metals requirements for both lead and  
10          arsenic.

11          Diatomaceous earth continues to be  
12          used as a filter media in the majority of  
13          brewery, winery, and juice companies for both  
14          organic and non organic products. It also is  
15          used by corn and oil seed milling companies for  
16          the production of sweeteners and oils. And it is  
17          used as the filter aid of choice by many other  
18          food and pharmaceutical industries.

19          Diatomaceous earth is used to improve  
20          the efficiency of solid/liquid separation  
21          processes, e.g. the removal of yeast from beer or  
22          wine. Diatomaceous earth does not exist within

1 the final organic product, and is classified as a  
2 processing aid, and not as an ingredient.

3 In closing, the International  
4 Diatomite Producers Association supports the NOSB  
5 Subcommittee on Handling's recommendation to  
6 retain diatomaceous earth on the National Organic  
7 Program List of Allowable Substances, and urges  
8 the National Organic Standards Board to adopt its  
9 Subcommittee's recommendation. Thank you for  
10 your consideration of these comments.

11 MR. CHAPMAN: Thank you. Any  
12 questions? Seeing none, up next is Aviva Glaser,  
13 followed by Dan Martens, then Julene Koslowski.  
14 Aviva Glaser, I didn't see you. We have not been  
15 able to find you. Aviva going once, then twice.  
16 Seeing none, we're going to move on to Dan  
17 Martens. Dan, are you on the line?

18 MS. ARSENAULT: I see Dan on the line.  
19 And this is his PowerPoint presentation. So,  
20 Dan, if you're talking we can't hear you.

21 PARTICIPANT: Good afternoon.

22 MS. ARSENAULT: Dan, is that you? No.

1 MR. CHAPMAN: Dan, are you there? I  
2 need someone to unmute him. Dan, one more time.  
3 Are you there? Dan, we're not hearing you if you  
4 are there.

5 PARTICIPANT: I'm on a headset, he  
6 said.

7 MS. ARSENAULT: He's on a headset.  
8 All right. So, we can't hear you. So, are you  
9 able to dial in on the phone? Do you want to  
10 chat that into me? I'll give you the number.

11 PARTICIPANT: He will call.

12 MS. ARSENAULT: Okay, great. You have  
13 the number? He must.

14 PARTICIPANT: I can send that.

15 MR. CHAPMAN: All right. While we  
16 wait for Dan to call in, I want to check, is  
17 Julene Koslowski here? We are moving back to the  
18 list.

19 Is Jennifer Davis, or Yemi Amu, or  
20 David Talbert, or Miraj Patel here? Dan Martens  
21 is the one last commenter. Hold on while we wait  
22 for Dan to call in.

1 PARTICIPANT: Tom, tell us a joke, or  
2 sing us a tune while we wait.

3 MR. MARTENS: Hello.

4 MR. CHAPMAN: Dan?

5 MR. MARTENS: Yes. I apologize for  
6 the technical glitch. I thought I could just  
7 come in on headset. And I'm not the last guy, so  
8 I really feel embarrassed. Sorry.

9 MR. CHAPMAN: All right, Dan. If you  
10 could start with your name and affiliation for  
11 the record?

12 MR. MARTENS: Yes. Dan Martens. I'm  
13 with Novamont North America. And thank you very  
14 much. And thank you for accommodating my slides.  
15 Next slide, please.

16 Compostable mulch films provide  
17 holistic benefits to farmers, including carbon  
18 reduction, farming practice efficiency, and the  
19 elimination of polyethylene plastics disposal.

20 The film in my comment have 15 years  
21 of EU in field experience. And all certified  
22 compostable to ASTM6400 standards, with

1 additional soil biodegradation certification.

2           These are not experimental mulch  
3 films. They have been commercially available in  
4 the U.S. for ten years. And in 15 years of  
5 continual annual application there has been no  
6 instances of soil contamination from any  
7 component of the film, or the film itself.

8           Here are some cases where certified  
9 compostable mulch films have become new tools for  
10 farmers, increasing efficiency, while decreasing  
11 environmental impact. Next slide, please.

12           Tomatoes. Plastic mulch films cannot  
13 be used with machine harvesting, since plastic  
14 films jam machinery. However, compostable films  
15 exit through the back of the machinery like green  
16 plant matter.

17           Using the mulch film increases harvest  
18 yields by 25 percent. And the mulch films are a  
19 new tool that improves both tomatoes and  
20 harvesting. Next slide, please. Next slide,  
21 please. Next slide, please.

22           For asparagus compostable mulch film

1 has the same weight control as plastic film, but  
2 it's much thinner. Therefore, the plant can  
3 break through the film. And the compostable film  
4 requires less material and energy to produce.  
5 Thus, a lower carbon footprint versus plastic.  
6 Next slide, please. Next slide, please. Next  
7 slide, please.

8 For rice. When using compostable  
9 mulch film less water is required. This practice  
10 is only two years old. And the machine pictured  
11 has only, was only invented last year. Again,  
12 better crops and decreased total environmental  
13 impact. Next slide, please. Next slide, please.  
14 Next slide, please.

15 I ask NOSB to vote no on the removal  
16 of compostable mulch films from its National  
17 List. Please consider compostable mulch films to  
18 be new tools to help small farmers. Farmers who  
19 have tried compostable films want them to be  
20 okayed for organic.

21 These products reduce labor, cut  
22 costs, produce stronger crops, and eliminate the

1 burning or landfilling of disposable plastic.  
2 Please give these products the innovative  
3 excitement that they have earned. Do not look at  
4 them as a sleight of hand to put oil in the soil.  
5 That issue's not happening.

6 And you may wonder how this product  
7 differs from petrochemical fertilizers that  
8 attach to plant roots. But for compostable mulch  
9 films please visualize this. That the plants'  
10 roots are not absorbing the film.

11 The film is transformed by soil,  
12 microorganisms. They eat it, they poop it, then  
13 they die. Organic matter, carbon dioxide to  
14 water. It's what is created, and the plants like  
15 it. Thank you.

16 MR. CHAPMAN: Thank you, Dan. Any  
17 questions from the Board? Harriet, then Asa.

18 MS. BEHAR: So, there are petroleum  
19 based fertilizers that plants also like. How is  
20 the breakdown of your product different from  
21 those?

22 MR. MARTENS: Well, I can't speak too

1 much for exactly that. However, I know that  
2 basically, I think what I hear a lot is our  
3 material being called petroleum based materials,  
4 and being absorbed by the plants, or being  
5 contamination of the soil. And that's not  
6 happening.

7 So, I'll defer to how they're the  
8 same. But they're, certainly are not that. Does  
9 that make sense?

10 MS. BEHAR: Okay.

11 MR. CHAPMAN: Asa.

12 MR. BRADMAN: I have a couple of  
13 questions. And Harriet --

14 MR. MARTENS: Sure.

15 MR. BRADMAN: -- I'm just going to get  
16 clarification on what you mean by petroleum based  
17 fertilizers. Because I think we're talking there  
18 about fossil fuel based fertilizers that are  
19 sources of, you know, nitrogen, and other mineral  
20 nutrients, versus, I think what you're saying  
21 here with the compostable film is that it's a  
22 source of carbon. And that it's a, it's not a

1 fertilizer.

2 MR. MARTENS: Correct.

3 MR. BRADMAN: And I just want to  
4 clarify that. And also, let us know what  
5 proportion of the film is, you know, old carbon  
6 versus new carbon? In other words, how much is  
7 fossil fuel based?

8 And just to clarify, it seems like  
9 what you're doing is manufacturing the polymer so  
10 it's essentially munchable by bugs. Right?

11 MR. MARTENS: Yes.

12 MR. BRADMAN: Mainly bacteria. And is  
13 there any proportion that's not munchable by  
14 bugs? And then finally, if you could also send  
15 me, I'm interested in this question of what is  
16 the mass of the mulch, you know, on a, say on a  
17 square meter basis, milligrams or grams per  
18 square meter. Just to understand the amount of  
19 material that's being incorporated into the soil.

20 MR. MARTENS: Yes. Pretty much on the  
21 first question, I think you're asking what's the  
22 renewable content. I can speak for my company.

1 But just in general, it can vary.

2 All of the, for example, probably  
3 state of the art is probably about 40 percent  
4 from plant based material. And that's due to  
5 green chemicals, chemicals that probably didn't  
6 exist in green, from plant based even five years  
7 ago. And I can go into some of those if you'd  
8 like.

9 But there's been a, pretty much a  
10 nice, I guess new industry, the green chemistry,  
11 and new advancements. Some of the chemicals that  
12 were compostable mulch films in the past that  
13 could not be made from plant based materials now  
14 can be.

15 So, I think pretty much, I'm going to  
16 defer to, like France, where they're requiring  
17 home compostable material for replacing all the  
18 plastic bags. Plus renewable content. There  
19 they started with 20 percent renewable content.  
20 Then this last year it was 30, and now 40.

21 So, I would say based on that French  
22 law 40 percent is kind of the current. And I

1 would say probably what's doable today by major  
2 manufacturers is probably about 50 percent.

3 As far as all the carbon, all the  
4 carbon is carbon that should be, that is  
5 ingestible, and that should be converted. Did I  
6 answer your question?

7 MR. BRADMAN: Yes. Thank you.

8 MR. MARTENS: And for follow-ups, I'm  
9 happy to supply follow-ups. I'm sorry this is a  
10 very quick -- All these are case studies on their  
11 own. But in this timeframe I wanted to just give  
12 you, make you aware of them.

13 MR. BRADMAN: Right. And there was  
14 just a speaker who spoke just before you that  
15 claimed to have 100 percent biological-based  
16 film. And are you aware of any companies, other  
17 companies that are making similar products?

18 MR. MARTENS: I'm actually familiar  
19 with those fellows. We have not, in the current  
20 technology we're not aware of that. I mean, I do  
21 agree with 100 percent that all mulch films  
22 finished product must be tested.

1 I think this was a safe thing that  
2 must be done, otherwise you open, you can open  
3 the door to a lot of misuse. We're a major  
4 innovator/leader in this industry. We haven't  
5 heard of this.

6 You can make mulch films 100 percent.  
7 But you've also got to remember they have to  
8 perform in the field, they have to meet testing.  
9 And you can do this with PLAs, you can do it with  
10 a lot of polyesters. But there's a lot of other  
11 requirements that make them usable and  
12 beneficial.

13 So, I don't know. And I've heard of  
14 this product for a couple of years. I just have  
15 never seen it. I've never actually seen it. So,  
16 I can't comment, other than I'm skeptical until  
17 the science is done on it.

18 MR. CHAPMAN: Okay. We're going to  
19 have to stop we're five minutes over. Thank you  
20 very much for your comment.

21 MR. MARTENS: Okay.

22 MR. CHAPMAN: All members of the

1 public, thank you so much for your time,  
2 thoughtful comments, and answering our questions.  
3 I would like to thank Members of the Board for  
4 your careful attention and engagement during this  
5 time, and the National Organic Program for  
6 helping to support this activity, and providing  
7 all the infrastructure to make it happen  
8 seamlessly.

9 So, thank you everybody. For folks  
10 who will be in Florida for our meeting, I look  
11 forward to seeing you all on Tuesday of next  
12 week. And have a great weekend. Thank you.

13 MS. ARSENAULT: Thank you, everyone.  
14 Thank you, Tom. Great job. Thanks, everybody.

15 (Whereupon, the above-entitled matter  
16 went off the record at 4:07 p.m.)  
17  
18  
19  
20  
21  
22

<b>A</b>	
<b>A-Dae</b> 1:19 10:6,7,11	146:2
<b>A&amp;M</b> 50:18	<b>addition</b> 26:19 28:14 54:7
<b>ability</b> 47:10 144:7 167:21	<b>additional</b> 26:14 31:2 51:8 136:13 143:22 148:21 157:6 175:1
<b>able</b> 9:19 44:22 46:4 52:10 61:8 86:4 87:2 89:1 91:1,12 124:12 150:10,12 172:15 173:9	<b>Additionally</b> 17:11 19:6 103:8
<b>above-entitled</b> 183:15	<b>address</b> 15:11 37:13 43:2,11,15 45:13 75:1 86:21 87:2 88:9 125:11,15 139:3,22 148:1
<b>absence</b> 142:10	<b>addressed</b> 15:9 102:17
<b>absolute</b> 139:10,18	<b>addresses</b> 15:5 64:2 72:21
<b>Absolutely</b> 21:13 94:9	<b>addressing</b> 38:20 139:8 148:4
<b>absorb</b> 47:10	<b>adhere</b> 12:13
<b>absorbed</b> 178:4	<b>Adjourn</b> 3:22
<b>absorbing</b> 177:10	<b>adjusted</b> 103:13
<b>accept</b> 7:21	<b>Administration</b> 170:9 170:12,18,21
<b>acceptable</b> 14:18 157:4	<b>administrator</b> 94:1
<b>acceptance</b> 32:6	<b>admit</b> 115:22
<b>accepted</b> 18:13 35:4	<b>adopt</b> 172:8
<b>accessible</b> 161:13	<b>adopted</b> 65:2,10 87:9
<b>accommodating</b> 174:14	<b>advancements</b> 180:11
<b>accompanied</b> 65:17	<b>advantage</b> 84:16
<b>account</b> 150:12	<b>advantages</b> 32:21 33:9
<b>accounts</b> 31:8	<b>adverse</b> 47:15
<b>accumulate</b> 156:11	<b>advisable</b> 67:13
<b>accumulated</b> 91:14	<b>advisor</b> 90:1 139:9
<b>accumulation</b> 111:17	<b>Advisory</b> 2:2 4:21
<b>accurate</b> 13:19,20	<b>advocates</b> 19:12
<b>acid</b> 44:13 167:13	<b>aeroponic</b> 32:1 33:21 48:14
<b>acids</b> 29:1 44:16 167:6 167:11	<b>aeroponics</b> 46:16 47:3
<b>acre</b> 141:11,11 148:8	<b>affect</b> 59:9 91:2 148:7 164:11
<b>acreage</b> 97:21	<b>affiliation</b> 7:5 12:5 16:11 26:4 30:3 42:15 46:11 50:12 54:1 63:3 67:1 70:21 74:14 89:17 95:5 101:15 110:9 115:5 132:3 138:15 147:20 158:10 166:4 169:13 174:10
<b>acres</b> 18:7 67:3,5 132:6 133:11 138:18	<b>affiliations</b> 7:7 36:17
<b>act</b> 4:21 91:22 92:2 95:20 97:19 113:18	<b>afford</b> 19:11
<b>activation</b> 18:3	<b>affordability</b> 132:16
<b>activities</b> 4:14 138:3	<b>affordable</b> 19:11
<b>activity</b> 38:19 183:6	<b>affordably</b> 135:6
<b>actual</b> 61:21 62:6	<b>mentioned</b> 14:20
<b>Ad</b> 63:14	<b>afraid</b> 19:13 134:13
<b>Adams</b> 70:18 74:9 85:1 85:17,19,20 95:4 101:8,9,16,16 105:7 105:12 106:7 107:8 107:22 108:8,15,22 109:8,15,18	<b>afternoon</b> 4:4 27:19 67:2 120:9 169:15 172:21
<b>adapted</b> 88:9	
<b>add</b> 103:1 136:9 144:14 145:10 147:1 160:20	
<b>added</b> 16:20 102:14 104:21 136:14 144:1 145:2	
<b>adding</b> 21:1 55:18	
	<b>ago</b> 94:20 139:5 180:7
	<b>agree</b> 37:17 82:18,18 92:14 181:21
	<b>agricultural</b> 39:17
	<b>agriculture</b> 1:1 12:22 19:12 20:10 39:2 50:20 52:21 64:4,12 72:2 98:4 115:15,18 119:21 122:4,11 123:13
	<b>agro</b> 167:5,7,10,12
	<b>agrobusiness</b> 132:7,12 140:11
	<b>agroinfiltration</b> 26:20 27:10 63:20 64:19,21
	<b>ahead</b> 6:22 37:4 42:20 62:15,16 69:11 92:13 99:21 105:7 110:14 138:19 151:15 158:9
	<b>aid</b> 157:7,16 170:10,16 170:20 171:17 172:2
	<b>aiding</b> 157:9
	<b>Akron</b> 36:19
	<b>alarm</b> 142:8
	<b>alfalfa</b> 127:2
	<b>algae</b> 71:9 72:19 96:2
	<b>align</b> 96:17
	<b>alignment</b> 14:6
	<b>aligns</b> 99:7
	<b>alive</b> 24:2
	<b>allow</b> 35:13 44:7 105:15 119:19 120:12,21 125:21 151:9
	<b>Allowable</b> 172:7
	<b>allowed</b> 22:9 29:2 97:9 99:2 126:10 170:6
	<b>allowing</b> 54:5 105:9,16 161:5
	<b>allows</b> 38:3
	<b>Alphagen</b> 88:2
	<b>altered</b> 27:8
	<b>alternate</b> 69:1
	<b>alternative</b> 17:8 91:18 92:18,22 105:4 108:11 122:12
	<b>alternatives</b> 159:12
	<b>amend</b> 168:11
	<b>America</b> 35:16 77:6 174:13
	<b>American</b> 47:13
	<b>Americans</b> 35:15
	<b>AmeriCulture</b> 110:12
	<b>amino</b> 44:13,16
	<b>ammonia</b> 111:11
	<b>amorphous</b> 170:1
	<b>amount</b> 45:11 126:9 136:12 143:21 148:17 165:1 179:18
	<b>amp</b> 87:11
	<b>ample</b> 27:3
	<b>Amu</b> 36:7 42:10 46:1 173:19
	<b>anaerobic</b> 85:21 86:8 86:10,14
	<b>analysis</b> 39:10 127:3
	<b>Analyst</b> 2:5,6 166:6
	<b>and/or</b> 108:21 148:18 155:12
	<b>animal</b> 18:10 42:17 43:16 48:10 65:7,18
	<b>animals</b> 17:17 65:13,22 167:19
	<b>annotations</b> 96:12
	<b>annual</b> 68:3 91:10 143:12 150:20 175:5
	<b>ANS</b> 94:1
	<b>answer</b> 23:1 69:7 78:7 81:19 107:19 136:16 137:3 142:19 144:7 151:11,18 155:13 159:13 181:6
	<b>answered</b> 50:3 79:3 107:19
	<b>answering</b> 59:16 183:2
	<b>answers</b> 22:4 41:9 148:6 161:16
	<b>anti-soil</b> 120:3
	<b>antibiotic</b> 90:14
	<b>anybody</b> 80:20
	<b>anymore</b> 85:3 126:2
	<b>anyway</b> 120:5
	<b>apologies</b> 46:18 63:6 110:17
	<b>apologize</b> 174:5
	<b>applicable</b> 104:14 156:9
	<b>application</b> 139:12 146:21 149:22 175:5
	<b>applications</b> 91:10 102:16 149:7 150:2
	<b>applicator</b> 154:2
	<b>applied</b> 19:15 62:2
	<b>apply</b> 25:12 31:3 64:4 139:13 148:10,21 149:19,21 152:13 155:10 157:21
	<b>applying</b> 96:9 98:16 146:4
	<b>appreciate</b> 34:9 74:22 84:21 98:2 133:19 137:10 147:10,12 161:8
	<b>appreciated</b> 138:6
	<b>appreciates</b> 104:18
	<b>approach</b> 93:1,21 103:22 105:19

**approaches** 47:21 99:8  
**appropriate** 55:19 73:2  
 128:11  
**approval** 44:4  
**approved** 30:8 43:3,8  
 133:13 161:5  
**April** 39:9  
**aqua** 20:5  
**aquaculture** 23:15  
 113:4  
**aquaponic** 12:10,20  
 15:2,8 16:15 18:20  
 21:11 23:8 32:1,12  
 35:12 48:13 54:4,5,11  
 55:5,9,11,14,17 56:3  
 57:1 58:5,6 62:3,7,11  
 102:4 104:21 105:3  
 108:21 109:4 110:19  
 111:2 112:4,7,18,22  
 113:13 119:15 140:10  
 140:13 141:18  
**aquaponically** 112:13  
 112:15,20 113:8,16  
**aquaponics** 13:4,6,9,21  
 13:22 14:1,5,9,18  
 15:12,15,17 18:12,21  
 19:1,2,4,21 20:1,7  
 23:21 46:16 47:3  
 54:22 57:8 58:4,9,17  
 58:19,21 59:2 62:4  
 100:17 104:17 112:5  
 113:11,19  
**aquatic** 18:6 22:21  
 38:18 71:9,20,21  
**aqueous** 38:2 54:16  
 113:9  
**arable** 19:7  
**Archi's** 132:6,6 133:11  
 138:17  
**Archipley** 114:11 115:1  
 115:1 131:15,15,21  
 132:4,5 135:15,20  
 136:8,15 137:8,10,18  
 138:7,16,17,20  
 142:15,21 143:5  
 144:6 145:22 146:22  
 147:11  
**area** 11:18 15:12 41:17  
 51:12 103:20 155:12  
 165:11  
**areas** 15:5,7 17:9 133:1  
**argument** 84:5 122:20  
**arithmetic** 126:8  
**Arizona** 17:4  
**arrangement** 31:12  
**arrived** 6:20  
**Arsenault** 2:2 3:15 5:15  
 5:18,21 6:2,5 8:8,11

8:13,17,20 9:3,6,10  
 9:14,16,18,22 10:3,6  
 10:9,12,15,18,21 11:2  
 11:4,7,16 36:14,21  
 37:3 50:1 56:18 74:15  
 78:17,21 85:2,5,8  
 89:1 94:19 95:1  
 114:15 131:18 132:1  
 172:18,22 173:7,12  
 183:13  
**arsenic** 171:10  
**art** 180:3  
**article** 47:5,11 48:2  
**articulated** 15:18  
**artificial** 103:11 104:3  
**Asa** 1:16 8:14,16,20  
 56:18,20 109:17  
 118:14 162:10 165:5  
 177:17 178:11  
**ascertains** 13:11  
**Ashley** 1:13 10:15,18  
 29:20 36:6 42:9,11,13  
 42:16 94:4 135:10  
 142:17 151:14,15  
**aside** 47:5  
**asked** 7:5 43:13 55:5  
 60:20 98:1 109:20  
 146:17 151:19  
**asking** 19:18 57:3  
 98:14 145:18 179:21  
**ASMD** 161:2  
**asparagus** 175:22  
**aspect** 86:13  
**assess** 92:16  
**assessment** 13:19,21  
 91:15 92:15  
**assist** 5:1 52:18 156:22  
**Assistant** 2:4  
**associate** 48:8 71:2  
 133:15  
**associated** 48:19 49:2  
 161:11 166:22  
**Associates** 95:8  
**association** 49:10  
 101:17 115:8 119:7  
 169:17,18 172:4  
**assumption** 141:9  
**assured** 73:4  
**assures** 49:12  
**ASTM** 159:22 161:3  
 162:19 163:4  
**ASTM6400** 174:22  
**Atkinson** 71:4  
**Atlantic** 72:8  
**attach** 177:8  
**attack** 140:21  
**attempt** 15:16 99:5  
**attempted** 133:14

**attention** 183:4  
**audible** 5:17 9:2,5,9  
 11:15 15:22 29:13  
 42:4 45:17 46:2 49:17  
 53:6 56:14 66:13  
 73:15 74:5 88:16  
**audio** 53:2  
**August** 13:7 31:5 37:11  
**Austin** 17:7  
**Australia** 111:22  
**Australian** 111:22  
**authored** 37:11  
**availability** 96:10 98:16  
 99:17 144:12,15  
 150:6  
**available** 12:14 46:21  
 52:18 54:20 55:1  
 68:14 96:7 99:13  
 109:11 129:16 146:16  
 175:3  
**avian** 44:7  
**Aviva** 165:21 169:7  
 172:12,14,15  
**avoid** 161:9  
**avoiding** 68:1  
**aware** 28:11 181:12,16  
 181:20

---

**B**


---

**baby** 148:17  
**back** 11:8 33:13 40:8  
 47:14 62:17 63:6  
 68:19 84:3 86:12  
 114:21 117:1 118:13  
 119:6,8 134:15 137:6  
 138:12 144:14 151:8  
 173:17 175:15  
**background** 74:17 75:6  
 78:19 79:1  
**backs** 141:2  
**backward** 32:19  
**bacteria** 22:17 54:14,18  
 179:12  
**Bacterial** 111:9  
**bacterium** 167:7  
**bad** 59:5 123:15,18  
 156:12  
**baffle** 25:3  
**bag** 82:15,16  
**bags** 180:18  
**Baird** 1:15 8:9,10 83:2,4  
 108:4,6,13,19 109:6  
 109:14  
**balance** 44:12  
**balanced** 103:21  
**balancing** 44:14  
**ban** 13:4 14:17 15:14  
 19:4 141:3

**bandwagon** 122:22  
**banishment** 33:16  
**barn** 124:3  
**barred** 67:13  
**barrier** 154:21  
**barriers** 154:7 155:3,20  
**base** 20:6 161:20  
**based** 20:7 33:22 55:20  
 71:19 73:4 96:15  
 116:7 117:2,7 121:20  
 122:3 146:7,7 152:2  
 159:4 160:8 161:20  
 161:22 162:2 169:22  
 177:19 178:3,16,18  
 179:7 180:4,6,13,21  
**basically** 21:18 51:13  
 87:10 130:20 178:2  
**basis** 79:21 141:11  
 143:11,12 150:20  
 165:11 179:17  
**BC** 134:15  
**beat** 123:1  
**becoming** 139:14,17  
**beer** 171:21  
**began** 123:3  
**beginning** 6:3,4 51:6  
 117:14 132:9  
**begun** 149:2  
**behalf** 46:16 90:2  
**BEHAR** 1:15 8:12 34:18  
 99:22 106:9 107:21  
 121:19,22 122:2  
 123:16 136:2,4,11  
 137:5,9 143:18  
 161:19 162:5 168:21  
 177:18 178:10  
**belief** 140:9  
**believe** 48:22 55:13  
 64:16 72:17 138:12  
 140:14  
**benchmark** 40:10  
**beneficial** 14:15 22:16  
 47:17 55:18 182:12  
**benefit** 16:21 111:1  
 113:22  
**benefits** 34:19 86:7,9  
 111:10 158:21 161:11  
 174:17  
**benefitting** 59:11  
**berries** 67:4 70:6  
 152:20  
**best** 43:6,10 126:15  
 131:6 166:21  
**bet** 109:15  
**better** 10:12 41:20 47:5  
 91:19 97:20 100:19  
 102:17 108:4,5  
 121:22 122:18 123:7

123:12 124:8 146:15  
176:12  
**beyond** 111:7  
**big** 75:12  
**bigger** 21:12  
**Bill** 89:13 94:18,18,19  
94:20 95:3,3,3,4,7  
98:5,6,7,11 99:19,22  
101:2  
**billion** 38:14  
**biodegradability**  
158:16  
**biodegradable** 95:21  
158:18,21 159:5,7,16  
161:12 162:15  
**biodegradation** 159:11  
160:3 163:1,3  
**biodegration** 175:1  
**biodiversity** 71:19 73:6  
109:5 137:3,16  
**biological** 14:14 17:22  
133:2 136:21 138:3  
144:18  
**biological-based**  
181:15  
**biology** 22:16 24:2  
63:11  
**biome** 111:7 112:22  
**bioplastic** 159:10  
**bioplastics** 159:7  
**biopolymer** 160:5  
161:2,6,19  
**biopolymers** 160:5  
161:1,6  
**biosecured** 17:15  
**biotech** 64:17  
**biotechniques** 66:7  
**biotechnologies** 64:3  
**biotechnologist** 28:6  
**biotechnology** 65:3  
167:15 168:9  
**biotic** 97:7  
**bird** 43:7 72:15  
**birds** 43:9 44:9,19,21  
45:2 72:6  
**bit** 21:4 61:16 70:3,5  
75:6 78:5 84:11,13  
108:16 110:16,16  
127:21 128:7 162:17  
165:5,8  
**bits** 167:20  
**blackberries** 148:9  
**blending** 160:6  
**blood** 47:19,19  
**blueberries** 148:9  
**board** 1:3,9,12 4:7,8,11  
4:20 5:9 7:8,16,20,22  
8:7 11:10 13:8 15:21

17:19 20:14 27:3  
29:12 31:22 33:11  
34:14 35:4 37:5 39:9  
42:3,22 43:3,12 45:16  
45:19 49:16 53:5 55:4  
56:13,16 66:12 67:7  
68:18 69:4,9 70:14  
73:14 74:4 75:1,17  
84:10 88:10,15 90:4  
90:18 98:1 105:14  
109:7 114:8 149:6  
151:7,10 158:2 172:8  
177:17 183:3  
**Board's** 76:13 90:6,9,16  
**boat** 121:10  
**bodies** 18:5 30:14 48:4  
**body** 48:5,5  
**body's** 47:10  
**book** 120:8  
**books** 117:1  
**boundary** 123:22 124:3  
**box** 97:13,15  
**Boy** 128:16  
**BRADMAN** 1:16 8:18  
56:22 109:19 118:16  
162:11 163:8,15,17  
164:2,19 165:2,6,9,13  
165:16 178:12,15  
179:3,12 181:7,13  
**Brassica** 28:13,15 29:4  
**break** 22:1 141:15  
157:4 163:9,13 176:3  
**breakdown** 111:5  
145:12 157:17 177:20  
**breeders** 28:15  
**breeding** 28:13 29:5  
168:8  
**brewery** 171:13  
**BRIDGET** 2:6  
**brief** 83:21 168:18  
**briefly** 78:13 80:4  
**BRINES** 2:3  
**bring** 5:5 35:1 121:1  
**bringing** 117:19  
**brings** 17:4  
**broad** 138:2  
**broader** 92:21  
**broiler** 45:10  
**broilers** 45:5  
**broke** 165:5,7  
**broken** 17:22 22:22  
144:22  
**Brothers** 148:1  
**brought** 15:10 47:12  
78:14 140:2,4  
**brush** 138:2  
**bucket** 127:6  
**buffer** 22:11 155:12

**buffet** 148:16  
**buggy** 24:8  
**bugs** 179:10,14  
**Buhler** 29:20 36:7  
42:10,12,16,16,21  
45:21  
**Buie** 1:14 11:1,1,3,5  
**build** 117:11 130:17  
150:15  
**building** 120:16 129:8  
**built** 30:14  
**bundled** 8:4  
**burden** 107:4 151:5  
**burdensome** 106:11  
107:1  
**burning** 70:3 177:1  
**business** 7:8 68:7 75:8  
80:9 139:13 140:14  
148:7 150:9  
**businesses** 32:13  
**button** 85:8 89:10  
**buy** 81:2  
**buyers** 80:18,19 81:2,5  
**buzzer** 7:14,18  
**byproducts** 22:21  
43:16,19 44:7

---

**C**


---

**C** 72:9  
**C-O-N-T-E-N-T-S** 3:6  
**cadmium** 39:13,14  
**Cal** 132:7  
**calculate** 125:2  
**Caleb** 70:17 74:9 84:22  
85:14,14,20 88:19  
**California** 67:4 68:8  
89:22 150:6  
**call** 3:14 6:21 8:4,7  
173:11,16,22  
**called** 6:18 7:4 15:8  
39:1 117:3 168:1  
169:22 178:3  
**calling** 9:7  
**calls** 139:5  
**campaigner** 63:8  
**Canada** 17:3  
**Canadian** 73:7 99:11  
**canopies** 112:18  
**canopy** 72:16  
**capacity** 99:16  
**carbon** 86:15,16 141:15  
159:8 162:13 174:17  
176:5 177:13 178:22  
179:5,6 181:3,4,4  
**cards** 112:17  
**care** 117:13 120:15  
134:5,6,22  
**career** 12:18 132:12

**careful** 58:13 121:6  
183:4  
**carriage** 24:9  
**carried** 111:22  
**carries** 166:22  
**carry** 48:5  
**cars** 24:7  
**case** 21:19 28:17  
105:15 181:10  
**casein** 28:17  
**cases** 65:7 175:8  
**castings** 18:9  
**categorized** 27:16  
**caught** 57:20,21  
**causes** 96:13  
**causing** 168:4  
**cautions** 26:21  
**CCOF** 33:4 37:16 57:6  
133:22  
**CCOF's** 108:7  
**CEA** 30:5  
**cell** 28:16,19,20 29:2,9  
41:1  
**cells** 38:14  
**cellulose** 163:3,9,11,14  
**Center** 26:7,10,18 71:4  
166:7  
**CEO** 46:14 50:14  
**certain** 25:15 41:11  
49:6 67:12 126:9  
127:2 139:12 164:17  
**certainly** 79:8 109:8  
127:8 163:18 178:8  
**certification** 16:16 32:3  
44:6 56:1 57:20 59:12  
64:2 75:7 76:3 80:9  
100:11 103:2 107:12  
114:1 126:1 133:9  
138:22 175:1  
**certifications** 44:10  
96:14  
**certified** 30:9 31:10  
33:20 35:9 39:11,16  
44:6 48:14 49:11 54:6  
75:3,4 76:18 95:9  
98:12,22 102:2  
105:10 108:14 139:15  
139:18 140:7,8 141:3  
174:21 175:8  
**certifier** 37:17 76:3  
79:16,20 80:6  
**certifiers** 73:3 76:1 79:8  
79:18 102:18 103:4  
106:16 121:8  
**certifies** 101:22  
**certify** 126:14  
**certifying** 30:13 108:20  
121:8

**CFS** 27:3,18,21 168:7  
**Chair** 1:10,13,13,14  
**chairing** 5:9  
**Chairman** 5:8 36:9  
**challenge** 44:14,17  
 79:11  
**challenges** 51:8,14  
**challenging** 98:1 100:6  
 100:8  
**change** 19:7 32:15  
 35:18 99:7 167:21  
**changed** 44:2 129:14  
**changes** 58:1  
**channels** 136:22  
**characterization** 34:10  
**chart** 27:6,15 65:15  
 168:12  
**charts** 107:3  
**chat** 50:3 173:10  
**cheaper** 52:9  
**check** 173:16  
**chemical** 130:9  
**chemicals** 35:7 49:2  
 133:14 135:3 171:7  
 180:5,5,11  
**chemistry** 180:10  
**chia** 75:8,11,14,16  
 77:22 78:12 81:21  
**chickens** 21:21  
**Chilean** 118:1 125:20  
 126:9 128:8,9,20  
**chlorine** 43:2,9 133:13  
**choice** 171:17  
**choices** 96:22  
**choose** 132:11  
**choosing** 57:15  
**chosen** 132:15  
**Chris** 11:13 12:3 16:3,3  
 16:7,8,9,12 25:21  
**circadian** 103:12,21  
 104:8  
**circling** 63:6  
**cisgenesis** 26:19 27:9  
 27:18,22 28:6,12 29:8  
 63:20 64:19,20  
**cited** 27:21  
**citrus** 50:15,16 51:7,11  
 51:15,16,17,20,21  
 52:1,2,3,5,16,22  
**civilians** 132:11  
**claim** 21:14,16  
**claimed** 181:15  
**clamp** 84:13  
**Clarence** 16:9 25:22  
 29:19,20 30:4 36:3  
**clarification** 7:10 54:10  
 65:12 145:7 178:16  
**clarifier** 25:3,6

**clarify** 79:3 99:5 179:4  
 179:8  
**clarifying** 65:17  
**classification** 66:4  
**classified** 172:1  
**clean** 35:5,15 121:11  
 122:5  
**cleaned** 78:16  
**cleanliness** 121:16  
**CleanWorld** 85:21  
**clear** 21:9 23:10 26:22  
 27:4 72:13 76:6 91:5  
 107:9 152:15 154:21  
**clearly** 15:18 17:7 19:3  
 27:15 34:9 65:1 68:2  
 91:9 139:9,11 167:13  
 168:6  
**clients** 102:2,3  
**climate** 12:15 19:7  
 32:15 69:19  
**Clinical** 47:13  
**close** 79:15 80:6 82:1  
 100:13  
**closing** 3:19 172:3  
**co-founder** 16:13 132:5  
 138:17  
**coco** 70:1  
**code** 11:18  
**Codes** 171:7  
**Codex** 29:7  
**coir** 25:11 70:1  
**cold-blooded** 18:10  
**Colin** 115:1 131:15,16  
 137:3 138:11,11,14  
 138:16,19 142:16,18  
 147:8,10  
**collaborating** 164:22  
**collaboration** 160:13  
**colleague** 16:14 166:9  
**colleagues** 5:4  
**Collective** 89:19  
**Colorado** 17:10  
**column** 22:15  
**combinations** 160:10  
 160:19  
**combine** 78:14  
**combined** 166:19  
**come** 6:18 17:3 80:11  
 80:12 98:21 107:2  
 114:21 118:13 123:7  
 125:1 126:10 144:14  
 153:10 166:18 174:7  
**comes** 17:15 24:16,17  
 123:19 145:20 146:18  
**comfortable** 17:13  
 52:21  
**coming** 21:5 100:3  
 116:19 147:5 167:3

**commend** 83:4,13  
**comment** 1:5 5:13 6:19  
 7:13 12:6 16:2 19:2  
 20:22 42:20 59:20  
 63:10,15 69:5 77:21  
 79:5 81:20 83:22 87:2  
 90:5 94:6,13 98:12  
 110:15 137:14 169:13  
 174:20 182:16,20  
**commented** 168:7  
**commenter** 7:11,14 8:1  
 25:20 29:18 49:21  
 62:14 101:4 114:10  
 139:4,7 173:21  
**commenters** 7:4,17  
 131:11  
**commenting** 90:2  
**comments** 3:17,19 4:22  
 6:15,16 8:6 11:11  
 18:18,20 26:6,9,10  
 27:2,22 29:16 37:16  
 42:6 45:20 46:12  
 49:15,20 50:12 53:9  
 54:2 56:17 59:20 63:4  
 67:1 70:22 74:14  
 77:15 78:20 84:19  
 85:4,7 86:2 88:19  
 92:12 95:14,19,21  
 100:14 101:18 105:9  
 108:10 114:9 117:19  
 118:17,17 127:13  
 135:12 151:17 156:16  
 172:10 183:2  
**commercial** 70:9 96:9  
 98:16 99:17  
**commercially** 99:13  
 175:3  
**Committee** 2:2 4:21  
 33:2,13 107:16  
 170:12  
**commodity** 83:9  
**common** 96:15  
**communicating** 80:5  
**community** 12:11,14  
 61:2 72:6 92:21 102:8  
 111:19 135:6  
**compact** 31:20  
**companies** 95:12  
 171:13,15 181:16,17  
**company** 46:15 49:10  
 75:3,4,5 76:21 80:12  
 85:22 95:10 110:18  
 179:22  
**compare** 40:17 73:21  
**compared** 40:2 112:3  
 159:12 163:3  
**comparing** 141:10  
**comparison** 40:3,13

**compatible** 28:2 64:11  
 166:19  
**compete** 52:10 123:10  
**complete** 49:13  
**completely** 32:4 49:5  
**complex** 111:5 113:6  
 113:14 151:5  
**complexity** 107:12  
 151:2  
**compliance** 30:12  
 32:20 109:9 158:15  
 160:11 161:10  
**compliant** 31:18  
**complicated** 58:13  
**complies** 160:7 171:6  
**comply** 160:7 161:2  
**component** 175:7  
**components** 37:15  
 69:19,20 151:9  
 162:18  
**composed** 69:22  
 169:21  
**composite** 76:16  
**compost** 70:3 124:5  
 125:6 127:1,3,5  
 130:16 146:7,13  
 149:20 152:2 156:18  
 156:21 157:7,16  
**compostability** 159:22  
**compostable** 174:16,22  
 175:9,14,22 176:3,8  
 176:16,17,19 177:8  
 178:21 180:12,17  
**composting** 25:10  
 158:16 159:10 162:21  
 162:22  
**composts** 157:20  
**compound** 111:11,12  
**comprehensive** 15:4  
 90:22 91:13 93:6  
**comprise** 87:17  
**comprised** 87:15  
**compromise** 33:6 57:7  
 119:10,13 120:11  
**computer** 9:8 46:19  
 85:10 114:13  
**concentrations** 38:21  
**concept** 152:13  
**concepts** 142:5  
**concern** 102:11 130:3  
 134:16  
**concerned** 127:14  
**concerns** 28:9 37:18  
 148:5  
**concluded** 170:13,18  
 170:21  
**concluding** 49:13  
**condition** 167:21

- conditioned** 48:22  
**conditions** 17:13 67:17  
 67:22 69:18 106:5  
 112:8,9,11 158:14  
 159:15,21  
**conduct** 122:14  
**conducted** 113:3 133:3  
**conflict** 19:4  
**confused** 127:13  
 154:13  
**confusion** 20:4  
**conjecture** 17:18  
**conjectures** 14:16  
**connections** 11:5 128:8  
**connections** 109:13  
**consequences** 96:13  
**consider** 19:22 155:1  
 176:17  
**considerably** 103:1  
**consideration** 33:5  
 87:14 172:10  
**considered** 20:11 29:5  
 29:10 67:16 68:3  
 116:13 120:19 144:5  
 152:19 170:7  
**considering** 120:2  
**consistent** 116:13  
**consisting** 111:3  
**consists** 149:14  
**constantly** 24:2,22  
**consult** 4:15 26:7  
**consulting** 166:9  
**consumed** 22:3  
**consumer** 18:17 19:5  
 58:14 73:4 134:1  
**consumer's** 140:16  
**consumers** 17:5 37:7  
 39:19 51:1 58:18  
 134:9,17  
**consuming** 49:3  
**contact** 17:15 24:16,17  
 59:22  
**contacts** 61:12  
**contain** 18:6,19 159:9  
**contained** 17:14 24:7  
**container** 37:10 67:8  
 68:21 101:19,21  
 102:7,15 103:1,7  
 108:14,21 116:18  
 120:12,18,22 125:7  
 125:12 126:14 133:7  
 136:12 143:22 148:2  
 148:8 152:1  
**container-** 33:21  
**container-based** 49:7  
**containerized** 132:15  
 132:20 134:3 138:21  
**containers** 103:5  
 126:22 133:3 136:5,7  
 144:2 154:1,10  
 157:22  
**containment** 31:20  
**contaminants** 116:3  
**contaminated** 77:8  
 83:16  
**contamination** 75:13  
 75:13 76:19 121:16  
 175:6 178:5  
**content** 87:12,20 128:7  
 179:22 180:18,19  
**contents** 28:20  
**context** 99:10  
**continual** 175:5  
**continue** 77:2,2 91:7  
**continued** 32:2 103:19  
 104:12,12  
**continues** 50:22 171:11  
**continuing** 71:20 90:19  
**continuous** 13:13  
 95:16  
**Contrary** 14:8  
**contribution** 111:13,16  
**control** 143:6,13 158:22  
 176:1  
**controls** 90:15  
**conundrum** 78:6  
**convene** 93:19  
**convened** 1:10  
**conventional** 13:20  
 29:5 39:4 40:15 81:20  
 123:12,14,18  
**conversation** 100:22  
**conversations** 79:1  
**conversion** 44:20  
 145:13  
**converted** 145:1 181:5  
**converts** 111:10  
**corn** 83:10 161:20  
 162:3 171:15  
**Cornell** 71:3,5  
**Cornell's** 39:2  
**corporate** 140:11  
**correct** 139:7 179:2  
**correctly** 33:22  
**cost** 48:19 49:9 51:9,18  
 52:9,10 146:16 150:5  
 151:1 159:12 160:1,3  
 160:17,19  
**costing** 160:10  
**costly** 150:3  
**costs** 77:12 159:1  
 160:20 176:22  
**country** 30:15 80:13  
**country's** 32:14  
**couple** 20:17 105:6,21  
 124:20 178:12 182:14  
**course** 69:15 103:3  
 107:11  
**cover** 86:4 124:6  
 130:15  
**cows** 21:21  
**create** 44:14,17,19 45:1  
 48:4 67:17,22 77:4  
**created** 177:14  
**creates** 158:17  
**creating** 65:12,21 72:12  
 77:5 100:8 161:7  
**creativity** 97:16  
**Creek** 89:19  
**creep** 158:19  
**Crisp** 12:9,9 16:13 17:6  
**criteria** 27:12 65:9  
 97:11  
**critical** 31:13 38:2,7  
 86:10 149:22 150:14  
 151:9  
**critically** 72:3  
**crop** 25:17 37:9 38:11  
 40:20 67:7,12 71:15  
 72:22 73:1 79:13 82:9  
 82:10 83:9,10 100:2  
 102:15,20 107:16  
 115:8 118:7 121:17  
 125:22 126:6,18  
 127:7 129:9 130:15  
 146:8 149:3 154:16  
 154:20 158:19  
**cropping** 124:6 130:15  
**crops** 1:14 13:18 14:12  
 14:15 29:4 31:19  
 33:13 37:14 49:7  
 67:22 68:2,20 83:16  
 84:9 102:17 104:19  
 113:17 116:16 117:17  
 120:10,18,20 125:4  
 126:4 127:17 129:9  
 130:19 143:18 148:2  
 151:17 152:18,20,20  
 153:1 154:15 160:15  
 160:15 176:12,22  
**crops'** 125:7  
**crossable** 166:14  
**crossing** 28:15 123:21  
 124:2  
**Crouch** 12:3 16:9 25:21  
 26:1,2,5,6 29:17  
 166:10  
**crowded** 121:3  
**crucial** 111:4  
**crude** 99:1  
**crushed** 22:10  
**Cruz** 89:22  
**cues** 103:14  
**cultivate** 164:17  
**cultivation** 37:20  
**culture** 23:18  
**cup** 146:20  
**curious** 61:11 153:16  
**current** 43:16 44:5  
 65:19 148:2 180:22  
 181:19  
**currently** 12:14 43:18  
 45:3 64:13,15 65:18  
 75:8 89:20 99:1  
 101:22 136:5 144:3  
**curve** 116:2  
**customers** 35:1 57:14  
**cut** 5:22 49:14 59:13  
 72:13 92:8 114:5  
 167:22 176:21  
**cuts** 97:18  
**cutting** 72:21 92:1  
**cycle** 68:16  
**cycles** 48:20  


---

**D**

---

**D** 72:10  
**D5988** 161:3 162:22  
**D6400** 159:22 161:3  
 162:21  
**damage** 118:5  
**Damon** 101:11,12,13  
 110:1,2,5,6,8,11  
**Dan** 1:19 10:13,15  
 169:8 172:13,16,17  
 172:18,20,22 173:1,2  
 173:3,16,20,22 174:4  
 174:9,12 177:16  
**Dana** 46:8 49:21,21  
 50:1 62:17,17 63:1,2  
 63:7 66:9  
**dare** 83:15  
**data** 40:5,17  
**date** 37:12 119:8  
**dates** 134:15  
**dating** 119:6  
**Dave** 9:18 74:9 85:1  
 88:20,21 89:2,3  
**Dave's** 9:20  
**David** 173:20  
**Davis** 11:12 173:19  
**day** 32:22 46:22 60:21  
 103:12,17 136:18  
 143:11,11 148:12  
**days** 24:15,21 25:16  
 159:13  
**DC** 166:8  
**de** 1:16 9:14,15  
**de-hulled** 78:15  
**deal** 84:3 129:1 155:12  
 158:14  
**dealing** 81:6

**decades** 29:3 52:2,3  
 98:18  
**decaying** 13:16 14:10  
**decide** 97:1 134:1  
**deck** 7:1 50:9  
**decompose** 22:3  
**decreased** 48:20 51:8  
 176:12  
**decreasing** 149:12  
 150:7 175:10  
**deepwater** 23:18  
**defer** 178:7 180:16  
**deficient** 127:4  
**define** 52:19,19 70:7  
**defined** 14:7 27:15  
 41:11 72:1  
**defines** 38:18  
**definitely** 107:15 108:9  
 108:18 156:1,21  
 157:7,9  
**definition** 27:10 29:7  
 64:16 65:2 68:20  
 117:1 143:21 167:14  
**definitions** 26:22 27:4  
 27:11  
**degradation** 120:17  
**degrade** 164:14  
**degrades** 117:9  
**degree** 12:17 37:20  
**degrees** 87:11  
**delivery** 54:18  
**demand** 140:16  
**demonstrate** 13:4  
 160:2  
**demonstrated** 18:16  
 38:11 111:20 113:5  
 137:15 170:14  
**denied** 133:9  
**Department** 1:1 48:9  
**dependent** 13:13 118:4  
**depending** 69:17,20  
 127:5 154:17  
**depends** 164:10  
**depth** 140:3  
**derive** 113:9  
**derived** 64:7 72:20  
**describe** 35:18  
**described** 133:8  
**desiccation** 81:22  
 82:10,16  
**designed** 24:11  
**desire** 32:5  
**detail** 27:17 87:4  
**determine** 32:19 55:19  
 69:16 125:3 126:8  
 127:15,19 130:8  
**determined** 27:6  
**determines** 103:8

**determining** 104:5  
 107:17  
**detrimental** 156:10  
**develop** 27:4 31:17  
 58:17 98:22 123:4  
**developed** 29:4 107:15  
 108:19  
**development** 85:21  
 93:17 102:9 103:20  
 104:13 110:19 149:4  
**DEVON** 2:5  
**dial** 114:17 173:9  
**diatomaceous** 169:19  
 169:20 170:1,5,7,14  
 170:18,21 171:1,4,5,8  
 171:11,19,22 172:6  
**Diatomite** 169:16 172:4  
**diatoms** 169:22  
**die** 19:16 177:13  
**diet** 21:22  
**dietary** 47:21  
**diets** 110:21  
**difference** 20:4 25:13  
 41:19 58:8  
**differences** 14:20 31:14  
 40:15 41:4,8 155:19  
 164:16,21  
**different** 18:4 24:5 40:4  
 41:1 67:21 76:14,17  
 99:10 103:5 104:4  
 143:14 145:8 152:8  
 152:21 156:17 162:2  
 164:3,4,6 165:13  
 177:20  
**differentiates** 20:2  
**differently** 73:21  
 122:11  
**differs** 177:7  
**difficult** 99:6 116:20  
 125:1 126:11  
**digestate** 87:9,10,15,18  
**digester** 85:22 88:11,13  
**digesters** 86:9,10,14  
 87:6 88:5  
**digestible** 44:19  
**digesting** 86:8,22 87:8  
**digestion** 144:18  
**digestive** 86:20  
**diligence** 15:16  
**DiMatteo** 95:8,11  
**dioxide** 43:2,10 177:13  
**direct** 14:6 19:4 61:14  
 90:16  
**direction** 31:3  
**directly** 59:16 60:2 61:7  
 78:7 109:10  
**Director** 2:2,4 4:4  
 169:16

**disagree** 126:13  
**disagreement** 47:2  
**disclose** 7:6  
**discovering** 70:9  
**discrete** 167:20  
**discuss** 86:6 87:4  
 88:12 93:20 137:7  
**discussed** 38:5 128:22  
**discussion** 71:14,17  
 92:20 93:17 98:15  
 102:9 113:20 115:22  
 123:13 141:6,22  
**discussions** 20:3 31:6  
 73:10 102:7 169:3  
**displayed** 38:17  
**disposable** 177:1  
**disposal** 174:19  
**disrupted** 103:13  
**distinct** 20:9  
**distinguish** 57:7  
**distinguished** 58:10  
**distinguishment**  
 119:19  
**distribution** 52:16  
 67:19  
**diurnal** 104:7  
**diverse** 55:8 111:18  
**diversity** 38:5 40:3,4,9  
 40:10,17 120:2  
**diverting** 86:11  
**Division** 2:2,4,5,6,7 4:5  
 5:4  
**DNA** 166:17 167:20  
 168:3  
**doable** 181:1  
**document** 13:11 26:17  
 71:14,17 92:20 93:4  
 93:18  
**documented** 33:1  
 86:15  
**documents** 71:12  
 101:20  
**doing** 15:13 58:19 59:5  
 59:10 62:16 70:4,5  
 77:22 78:2 82:5 83:5  
 83:7 105:22 120:12  
 125:12 131:4 140:14  
 140:15,15,17,18  
 156:10 179:9  
**dollars** 160:1,3,11,20  
**domestic** 52:12  
**door** 32:11 120:21  
 182:3  
**downstream** 77:12  
**dozen** 143:9  
**Dr** 73:19 100:21 112:1  
**drain** 24:4  
**drains** 25:9

**dress** 148:22 150:21  
**dressings** 149:21 150:2  
**dried** 87:11,19  
**drilling** 100:7  
**drinking** 39:15  
**drip** 148:22 149:21  
**driven** 51:8  
**dropped** 157:10  
**drought-stricken** 17:9  
**Drug** 170:9,11,17,20  
**dry** 17:10  
**drying** 88:6  
**due** 12:14 15:16 87:1  
 112:20 132:16,17,21  
 150:7 180:4  
**dug** 93:16

---

**E**


---

**e.g** 171:21  
**earlier** 7:15 57:1,5  
 142:19 166:10  
**early** 70:7 126:17,21  
 137:13 149:7  
**earned** 177:3  
**earth** 37:8 63:8 169:19  
 169:20 170:1,5,7,14  
 170:19,22 171:1,4,5,8  
 171:11,19,22 172:6  
**earthworm** 97:6  
**earthworms** 97:21  
**easily** 77:11 126:7  
**Eastern** 1:10  
**easy** 129:13  
**eat** 17:3 134:11 148:16  
 177:12  
**eating** 44:22  
**echoing** 121:21  
**ecological** 37:13 38:9  
**ecology** 41:1,3 113:3  
**economic** 50:21  
**economically** 51:3  
**ecosystems** 38:7 71:20  
 71:22 73:6  
**edicts** 31:15  
**editing** 64:9 66:6  
**Education** 93:20  
**Edwin** 101:13 110:5  
 114:10,11,12,15,19  
 138:12 147:13,14,17  
 147:19,22 157:10  
**effect** 14:3 47:15,20  
 90:18  
**effective** 49:9 146:16  
**efficacy** 90:6  
**efficiency** 171:20  
 174:18 175:10  
**effort** 69:7  
**efforts** 98:2

**either** 38:14 152:2  
**Ela** 1:17 9:16,17 20:16  
 23:3,7 60:19 137:12  
 137:22 153:16 154:14  
 155:14 156:16  
**elaborate** 92:18 98:11  
**electricity** 86:18  
**elements** 38:2 68:12  
 167:17  
**eliminate** 176:22  
**elimination** 174:19  
**Ellis** 158:6 165:20  
 169:7,10,14,15  
**elucidate** 92:21  
**email** 50:2  
**emailed** 109:11  
**embarrassed** 174:8  
**embrace** 134:18  
**emerges** 97:20  
**emerging** 64:3 166:6  
**Emily** 1:18 9:22 20:15  
 24:13 33:18 73:17  
 92:11,13 98:6 162:6  
**employees** 17:12 34:4  
**empty** 72:12  
**emulsion** 145:10  
**enabled** 38:1  
**encompasses** 33:2  
 34:7  
**encourage** 7:9,10 67:6  
 95:16 161:4  
**encourages** 104:12  
**encroach** 16:21  
**ended** 71:17  
**endorsed** 48:14  
**energy** 86:17 141:7,9  
 141:10,12,18 176:4  
**engagement** 183:4  
**engineer** 167:19  
**engineered** 65:7,13,21  
 166:17 168:2  
**engineering** 12:18,19  
 27:11 28:7 29:6 64:8  
 64:11,17 159:9  
 166:13 167:1 168:10  
 168:13  
**enjoy** 17:12 113:22  
**ensure** 64:1  
**enter** 54:12  
**entire** 8:4 22:17 28:21  
 82:20  
**entitled** 93:5  
**environment** 44:21  
 55:15 57:17 58:22  
 59:11 73:3 122:7  
 124:8 149:8,13 156:5  
 156:13 162:22  
**environmental** 12:18

123:20 126:20 175:11  
 176:12  
**enzymes** 157:4  
**EPA** 39:14  
**equivalency** 31:12  
**equivalent** 133:3  
 137:16 138:4  
**Eric** 101:14 110:6  
 114:11,21,22 115:1,4  
 115:6 118:10,11  
 121:19 124:19 127:10  
 131:8 152:3 153:4  
**especially** 52:22 68:13  
 83:10 96:12 98:17  
 122:3 152:22  
**essential** 48:3 54:9  
**essentially** 129:8  
 179:10  
**establish** 84:7 150:16  
**established** 64:10  
 72:22 83:18,19 123:8  
**establishes** 73:2  
**establishing** 92:5  
**establishment** 148:14  
 148:21  
**Ethics** 42:17  
**EU** 31:10 174:21  
**European** 31:11 88:3  
**eventually** 19:16  
**everybody** 6:7 77:13  
 183:9,14  
**evidence** 47:15,18  
 170:13  
**evolution** 90:6  
**exact** 76:7 118:20  
**exactly** 22:20 178:1  
**example** 56:6 57:8 87:3  
 90:13 99:5,11 100:12  
 112:5 145:13 180:2  
**examples** 51:13 81:15  
**exceeds** 39:14  
**Excellent** 9:18 53:14  
 70:20 89:8 115:4  
**excess** 44:20  
**excessive** 68:5 148:13  
 148:17  
**exchange** 59:22 60:2  
 61:14  
**excitement** 177:3  
**exclude** 64:7 66:6  
 67:20 151:3  
**excluded** 26:15,16,20  
 27:16 29:10 62:5  
 63:11,16,19,22 64:14  
 65:3,10,14,15,20 66:8  
 167:2,15,18 168:6  
**excluding** 28:12  
**exclusively** 110:22

**excuse** 124:3  
**Executive** 169:16  
**exhibited** 112:13  
**exist** 171:22 180:6  
**exit** 175:15  
**expand** 35:13,14  
**expectations** 160:17  
**expected** 76:6  
**expense** 107:13  
**expensive** 33:8 161:9  
**experience** 51:16 52:2  
 52:3 58:15 111:14,16  
 160:8 174:21  
**experienced** 6:10  
**experiment** 70:2  
**experimental** 175:2  
**experimenting** 55:17  
**experiments** 122:14  
**expert** 60:6  
**expertise** 61:18  
**experts** 52:20  
**explain** 24:15 58:16  
 162:16  
**explore** 127:21  
**exposed** 103:18  
**exposure** 37:15  
**expressions** 90:17  
**extension** 90:11 91:8  
 93:8,20  
**extensively** 75:10  
**extent** 91:16  
**external** 103:14  
**extra** 121:1  
**extract** 71:9  
**extremely** 113:5 119:5  
 144:16 145:13 146:1  
 146:3

---

**F**


---

**fabulous** 116:18  
**face** 4:16,16 32:11,15  
**faces** 51:7  
**facilitate** 54:15  
**facilities** 30:14  
**fact** 13:21 18:15 48:3  
 65:6 80:7 99:7 142:12  
**factor** 52:11  
**factors** 164:10  
**facts** 19:8 37:13 133:21  
**faculty** 71:3  
**fair** 128:14  
**fairly** 79:15 106:21  
**fall** 64:16 65:1,9 151:6  
**falls** 167:14  
**familiar** 59:22 108:8,16  
 181:18  
**family** 12:9 28:16 29:3  
 29:9 32:8 33:7,14

35:21  
**far** 62:9 81:8 119:6,9  
 141:18 181:3  
**farm** 12:9,20 16:15  
 55:20 67:18 70:10  
 75:11 95:9 99:15  
 116:10,11 117:13  
 120:15,16,17 123:20  
 123:22 124:3,8  
 130:14 131:1,5 137:1  
 139:14 140:7  
**farmer** 12:17 54:4 55:6  
 117:10 118:4 124:9  
 130:8 149:10  
**farmers** 18:8 30:12  
 32:13 47:2 48:14,17  
 48:21 49:12 55:16,17  
 62:2,3 95:11 115:7  
 117:7 119:6 123:2  
 124:5,7 131:6 132:9  
 134:10 174:17 175:10  
 176:18,18  
**farming** 12:11,21 14:5,7  
 15:2 16:18 18:7 19:1  
 30:8,8 32:17 33:3  
 47:4 48:19 49:1,4  
 52:3,5 54:22 67:13,21  
 68:22 69:3,6 86:8,13  
 89:19,21 93:4 116:21  
 117:8,9 123:3 130:12  
 130:13 132:19 161:12  
 174:18  
**farms** 12:9,9 16:14 17:6  
 17:16 18:4 30:5 37:17  
 54:5 56:3,3 86:12  
 132:14 141:21  
**fast** 45:4,9 164:14  
**favor** 105:9,16  
**favours** 19:19  
**FDA** 44:3 127:14  
**fed** 21:22  
**Federal** 4:21 18:18  
**feed** 19:10 43:18 44:8  
 44:20 127:2 130:18  
 134:10 145:21 148:19  
 152:4  
**feedback** 85:3,12  
 124:11  
**feeding** 20:19 102:13  
 105:10,17 106:1,12  
 118:6 125:13 129:10  
 135:6 155:16  
**feeds** 61:10  
**feel** 24:8 102:21 174:8  
**feeling** 115:12  
**feels** 19:1  
**fees** 51:17  
**fellow** 55:5 71:3

**fellows** 181:19  
**fertility** 13:17 14:11  
 102:16 143:12 147:5  
 149:14,15 150:14  
**fertilize** 21:15  
**fertilizer** 13:13 14:2  
 18:9 20:18 21:7 68:14  
 118:6 128:21 149:19  
 179:1  
**fertilizer's** 21:5  
**fertilizers** 22:8,9 59:8  
 86:20 99:12 117:21  
 118:3,5 129:2,7 130:9  
 177:7,19 178:17,18  
**fertilizing** 129:9  
**field** 38:21 39:8,11,13  
 76:16 78:2,14 101:19  
 102:6,19 122:3 133:3  
 133:8 174:21 182:8  
**fielding** 131:11  
**fields** 21:20 39:3 76:17  
**figure** 83:14 106:19  
 130:7  
**Figured** 10:12  
**fill** 130:17  
**filled** 115:17  
**fills** 135:16  
**film** 158:13,15,17,21  
 159:3,4,5,7,14,16,21  
 160:2,7,22 161:7  
 164:4,14 174:20  
 175:7,7,17,22 176:1,3  
 176:3,9 177:10,11  
 178:21 179:5 181:16  
**films** 158:18 161:12  
 164:22 174:16 175:3  
 175:9,12,14,14,18  
 176:16,17,19 177:9  
 180:12 181:21 182:6  
**filter** 170:10,16,20  
 171:12,17  
**final** 103:7 172:1  
**finally** 21:3 97:22  
 179:14  
**financial** 132:18  
**find** 7:1,3 18:1 33:13  
 40:8 46:4 75:11 79:21  
 89:2,9 138:4 146:8  
 172:15  
**finding** 81:10,11  
**fine** 35:20 146:15  
**finer** 164:16  
**finish** 7:18  
**finished** 7:12 181:22  
**Finland** 88:1  
**first** 11:12 12:16 13:6  
 14:21 17:20 20:14  
 24:7 42:21 43:1 50:15

64:20 84:3 93:3  
 115:10,20 116:6  
 120:9 122:16 124:22  
 125:15 129:20 146:17  
 148:12 150:13 161:17  
 161:18 162:20 179:21  
**fish** 14:3,14 17:19,21  
 18:10 20:20 21:5,8,16  
 21:17,17,18 22:2,4  
 24:17 25:2,7,14 43:15  
 44:7 72:6,7 110:21,22  
 111:10,13,16 145:10  
**fitting** 63:12  
**fits** 97:17  
**five** 54:4 102:3 126:22  
 153:8 180:6 182:19  
**flanked** 28:3  
**flexibility** 31:17 35:11  
**flock** 45:13  
**flooded** 18:8  
**floor** 92:1  
**flora** 14:7  
**Florida** 160:16 183:10  
**flow** 25:4,4 38:2  
**flower** 104:6  
**focus** 71:7 151:9 161:7  
**folks** 183:9  
**follow** 67:12 98:9 136:6  
 138:13  
**follow-up** 55:7 60:19  
 61:15,19 87:3 137:12  
**follow-ups** 181:8,9  
**followed** 11:12 25:21  
 29:19 42:10 46:8  
 66:16 70:17 74:8 85:1  
 114:10 131:15 158:6  
 165:20 169:7 172:13  
**following** 6:21 36:6  
 114:22  
**food** 19:10 21:17,17  
 22:2 25:7 26:7,10,18  
 35:15 37:14 41:15  
 49:2 51:3 57:16 63:7  
 88:7 95:11 105:2  
 122:8,9 130:10  
 148:17 149:12 166:7  
 170:9,11,17,20 171:7  
 171:18  
**Foods** 75:4 91:22  
 113:18  
**footnotes** 26:12  
**footprint** 86:16 176:5  
**forages** 61:9  
**force** 14:22 118:6  
 124:20 148:19  
**foreign** 167:8  
**foremost** 13:6  
**forest** 72:13,15

**Forgive** 6:8  
**forgot** 129:21  
**form** 12:22 54:13,16  
 68:4,10,11,12 86:18  
 100:17 145:15 146:19  
 147:2  
**format** 7:21  
**formed** 115:20  
**former** 90:1  
**forms** 146:9 152:7,8  
**forth** 15:11 142:7 145:1  
**forum** 158:14  
**forward** 4:22 6:8 26:21  
 32:18 73:10 94:7  
 98:21 183:11  
**fossil** 178:18 179:7  
**found** 11:16 38:14 39:6  
 39:12 43:5,9 53:19  
 76:19 94:16 101:5  
**foundation** 36:20 89:22  
 93:5 121:14  
**founded** 116:15,21  
**founder** 12:8 95:9  
**founding** 117:12 118:8  
**four** 36:10 52:2 63:12  
 140:2  
**fraction** 87:16,17 88:10  
**fractions** 87:14,15  
**France** 180:16  
**Francis** 1:14 10:19  
 39:21 59:14 69:10  
 105:6 118:12,12,13  
 124:11,14 145:16  
 151:14,15 153:14  
**free** 49:1 158:22  
**French** 180:21  
**Fresh** 30:5  
**Friends** 63:8  
**frogs** 136:21  
**front** 46:18  
**fruit** 104:6 149:4  
**fruiting** 152:19  
**fruits** 167:3  
**fuel** 86:18 178:18 179:7  
**fulfill** 68:6  
**full** 5:13 33:11 45:4  
 47:6  
**fully** 13:1 17:14 22:3  
**function** 23:20 24:12  
 90:7  
**functioning** 91:1  
**functions** 14:6 22:19  
 25:2  
**fundamental** 13:22  
**funded** 90:15  
**funding** 92:4 93:10  
**fungi** 54:14,19 55:11,12  
 55:18,20,22

**further** 4:16 7:10 32:5  
 47:7 68:20 72:17  
 73:10 98:11  
**Furthermore** 14:5,21  
 145:6  
**fused** 28:21  
**fusion** 28:16,19 29:2,9  
 142:6  
**future** 19:10 31:1 71:4  
 122:8 144:3

---

**G**


---

**gallon** 126:22  
**GAP** 44:6  
**Gardeners** 115:7  
**gate** 25:8  
**gene** 28:2,3 64:8 66:6  
 166:22  
**general** 7:22 58:10  
 137:7 180:1  
**generally** 60:7,9,10  
 170:8,19,22  
**generation** 12:16 64:8  
 134:19  
**generic** 146:7  
**genes** 27:7 28:8 166:14  
**genetic** 27:10,22 28:7  
 29:6 64:8,11,17,22  
 159:9 166:13,20  
 167:1,17 168:10,13  
**genetically** 65:7,13,21  
 166:16 167:18  
**genome** 166:20 167:22  
**genomes** 28:21  
**getting** 57:21 60:13  
 72:5 74:17 78:18 79:1  
 85:2 92:4 100:13  
 123:11 124:10 128:16  
 163:18 165:10  
**give** 7:5 21:4 114:2  
 129:20 135:1 136:1  
 136:17 157:1 164:5,6  
 173:10 177:2 181:11  
**given** 43:19 143:15  
 144:9  
**gives** 41:4  
**giving** 78:6 81:14 134:7  
**glad** 113:1  
**Glaser** 165:21 169:8  
 172:12,14  
**glitch** 174:6  
**glyphosate** 75:18,19  
 76:7,19 79:6,11,14  
**GMO** 63:18  
**goal** 96:19 97:15  
**gotten** 98:19  
**Governments** 95:12  
**grab** 123:8

**grading** 45:1 100:12  
**gradually** 68:8  
**grains** 75:16  
**gram** 38:14  
**grams** 164:8 179:17  
**Grant** 11:12,19 12:1,2,4  
 12:8 15:21 16:1,14  
**grass** 28:17 170:12  
**gray** 15:11  
**greatly** 151:1  
**green** 175:15 180:5,6  
 180:10  
**greenhouse** 17:15  
 39:11 101:19 102:2,6  
 109:3 112:19 126:18  
 126:21 141:7  
**greens** 12:12 16:17  
 38:21 112:3 144:20  
 144:20  
**grey** 15:5,7  
**ground** 146:14  
**group** 14:18 63:14  
 125:6  
**grouped** 23:22  
**grow** 16:16 95:12 96:21  
 99:15 104:6 120:18  
 150:15 154:15 155:7  
 155:22  
**grower** 51:15,20 133:7  
 135:4 138:17 150:15  
 151:6 158:20 160:13  
 160:15  
**growers** 32:9 41:16  
 103:1 104:1,9 123:14  
 123:18,19 125:19  
 126:14,15 134:16,17  
 134:19 140:6,10,13  
 140:21 141:4 150:12  
 151:19 153:19 155:8  
 155:9,15,17 156:15  
 158:22 161:7,10  
 164:17  
**growers'** 160:17  
**growing** 14:19 19:7,17  
 21:6,10 30:18,20  
 31:20 32:2,16 37:10  
 38:17 40:2 45:4,5,9,9  
 45:10 49:7 51:5 56:9  
 67:21 68:21 69:13  
 77:6 101:21 104:16  
 112:4 116:18 122:5  
 125:12 130:15,16  
 153:17,18 154:16  
**grown** 17:6,8,19,20  
 21:20 38:11,22 39:11  
 39:12,13 51:1 52:11  
 52:16 67:4 102:19  
 111:1 112:7,8,13,14

112:20 113:8,8,16,17  
 122:3  
**growth** 48:20 68:1  
 103:5,6,9 105:1 112:2  
 112:13 113:15 154:18  
**guess** 20:21 21:3 60:5  
 76:1 79:18 127:20  
 154:14 180:10  
**guidance** 26:16 30:13  
 31:2 32:6 33:15 65:14  
 72:18 88:8 102:9  
 107:16  
**guideline** 84:7  
**guidelines** 84:12 86:20  
 87:7 107:3 153:9,11  
**gypsum** 70:1

## H

**H2O** 46:14 49:10,13  
**habitats** 73:9  
**Hadlock** 71:1  
**hairs** 111:19  
**half** 47:1 63:12 112:12  
**half-life** 79:12 81:9  
**hand** 40:7 56:19,21  
 118:11 177:4  
**hand-set** 6:14  
**handbook** 126:3 153:5  
**handful** 81:1 129:14  
 134:16  
**handle** 129:13  
**handled** 129:18  
**handler** 75:3  
**handlers** 96:21 97:14  
**Handling** 170:4  
**Handling's** 172:5  
**Hanson** 27:18 147:19  
 158:6 165:20 166:1,5  
 166:5 168:19 169:2  
**happen** 44:10 66:5  
 68:17 183:7  
**happened** 72:10 84:17  
**happening** 62:7 91:6  
 177:5 178:6  
**happens** 83:11 120:17  
**happy** 69:7 138:7  
 151:11 164:9 181:9  
**hard** 108:2 123:3 125:3  
 138:4 144:6  
**harder** 96:14  
**harm** 149:13  
**harmful** 118:3 148:14  
 149:8  
**Harriet** 1:15 8:11 99:20  
 99:20,21 106:8  
 107:20 121:18,21  
 135:22,22 143:17  
 161:17,18 168:16,20

177:17 178:13  
**harvest** 73:5 78:9 149:2  
 175:17  
**harvested** 78:13  
**harvester** 72:11  
**harvesting** 71:10,15  
 73:1,22 74:1 175:13  
 175:20  
**hate** 128:16  
**hazard** 170:15  
**hazardous** 35:7  
**head** 141:16  
**headset** 9:7 85:10  
 114:16 173:5,7 174:7  
**health** 41:14 43:7 47:7  
 71:21 73:6 111:10  
 112:21 113:15 149:9  
**healthy** 19:9 57:17  
 150:16  
**hear** 5:16 7:14 8:18,22  
 11:22 16:6 29:22  
 33:22 34:9,17 42:12  
 49:22 50:7 53:15  
 62:19 66:20 74:11  
 80:19 85:3,17,18  
 94:22 95:2 101:9  
 108:2 124:13 134:21  
 147:15 157:12 165:8  
 166:2 169:10 172:20  
 173:8 178:2  
**heard** 33:20 35:16 84:5  
 118:19 121:20 122:2  
 137:20 139:1 153:22  
 154:22 155:15,17  
 166:8 182:5,13  
**hearing** 4:22 7:18 54:9  
 84:11 108:10 118:14  
 173:3  
**hearsay** 62:9  
**heart** 51:2  
**heat** 86:18  
**heavy** 39:10 171:9  
**held** 56:4  
**Hello** 8:11 34:15 99:22  
 174:3  
**help** 4:10 5:4 12:19  
 52:21 58:18 80:1  
 86:15 97:8 103:21  
 107:4 127:21 156:2  
 157:7,16 159:1 169:1  
 176:18  
**helped** 106:17  
**helpful** 120:6  
**helping** 48:15 59:11  
 106:18 183:6  
**helps** 95:11 97:20  
 156:21 161:9,10  
**Hemker** 25:22 29:19

36:6,9,18,19 37:5  
 40:7,19 41:10 42:1,7  
**herbicide** 75:20 76:9  
**herbicides** 35:6  
**herbs** 112:3,12,12,14  
**Hey** 8:20 10:6  
**hi** 8:12 9:22 10:15,18  
 34:18 39:22 56:22  
 78:21 83:4 89:8,18  
 94:5 106:9 109:19  
 121:19 135:11 142:18  
 161:19  
**high** 44:15,16 52:12  
 81:2 145:11 149:12  
**higher** 39:4 48:18 51:17  
 74:2 111:8 112:13,15  
 112:21 145:4  
**highlight** 18:15  
**highly** 13:12 88:8 118:2  
 118:5 128:21 129:2,6  
 129:15 152:7  
**hilarious** 139:22  
**historically** 121:13  
**history** 32:7 117:1  
 119:5  
**hit** 85:9 125:4  
**Hoc** 63:14  
**hold** 6:14 12:2 16:8  
 25:14 37:6 46:7 50:8  
 53:17 56:8 62:20 93:9  
 95:3 99:21 101:10  
 110:4 131:19 147:18  
 173:21  
**holds** 111:2  
**holistic** 174:17  
**home** 180:17  
**honest** 121:6  
**honestly** 100:5 148:6  
 154:2  
**honored** 63:13  
**hope** 22:4 88:10 133:17  
**Horton** 101:13 110:5  
 114:10 147:14,15,21  
 147:22 152:17 154:12  
 155:7,21 156:21  
 157:12,15  
**hour** 68:9 86:3  
**hours** 68:5 103:11,17  
**Houston** 135:2  
**human** 41:13 73:8  
 149:8  
**humane** 44:6  
**humans** 103:13  
**hundreds** 160:10  
**husband** 134:9 135:16  
 136:16  
**hydro** 20:5 108:14,21  
**hydro-** 140:12

**hydro-organic** 132:15  
133:15 134:2,14  
135:5  
**hydroponic** 13:12  
14:17,19 21:7,10  
23:11,19 30:7,12 31:2  
32:2,6,12,21 33:3,21  
34:20,22 35:20 37:19  
38:10,16,22 39:12  
40:13 41:7 48:13  
54:11 101:20 102:4  
104:20 105:3 109:4  
111:21 112:4,9,17  
113:21 116:17 119:15  
124:19 137:16 140:6  
140:10 141:17 142:2  
151:19 152:12,14  
**hydroponic/aquaponic**  
14:22  
**hydroponically** 111:1  
113:8  
**hydroponics** 13:7,10  
13:20 14:1,2 15:17  
19:22 20:2,10 23:16  
23:22 30:17 31:7,13  
32:7 33:14 37:10 39:2  
39:4,5,13 40:2,5,18  
46:16 47:3 57:8 58:10  
100:2 104:17 105:17  
105:22 112:10 113:12  
113:19 121:9 125:5  
141:8 143:21 144:5  
**hypertension** 47:21  
**hypoorganisms** 88:2

## I

**IB** 73:20  
**idea** 93:18 98:16 100:7  
117:2,20,21 119:14  
120:22 130:5,20  
139:19 140:1  
**ideal** 112:10  
**ideas** 23:15,15  
**identified** 79:9  
**identifies** 71:14  
**identify** 52:20  
**IDPA** 169:17,17  
**ignorance** 37:20  
**ignores** 32:14  
**ignoring** 129:7  
**image** 73:21  
**Imagine** 97:6  
**impact** 29:8 40:19  
112:5 123:20 175:11  
176:13  
**impacted** 141:5  
**impacts** 111:18  
**implemented** 88:4

**implications** 41:3  
**important** 34:21 41:8  
41:13 45:7 58:11,20  
72:2,3 73:11 83:5  
86:12 130:12  
**importantly** 6:11  
**imports** 50:22  
**impossible** 155:18  
**improve** 96:4 171:19  
**improvement** 95:16  
**improvements** 66:2  
**improves** 175:19  
**inappropriate** 20:6  
134:20  
**inception** 75:5  
**include** 26:11 63:18  
64:18 75:18  
**included** 30:7 32:8  
63:21  
**includes** 28:3 33:6  
82:14 111:8 143:6  
171:8  
**including** 15:9 26:8  
28:20 72:7 96:1 102:2  
103:14 109:4 174:17  
**inclusion** 105:2  
**inclusive** 33:8 69:1  
**incomplete** 64:14  
**inconsistent** 47:16  
**incorporated** 110:13  
179:19  
**increase** 97:21 151:1  
**increases** 107:11  
175:17  
**increasing** 19:8 68:8  
150:6 175:10  
**incredibly** 156:12  
**incur** 68:4  
**independent** 77:5  
141:19,19  
**indicated** 20:4  
**indicates** 40:22  
**individual** 90:5  
**individual's** 47:9  
**individuals** 51:13  
**indoors** 122:6  
**industrial** 169:18  
**industries** 171:18  
**industry** 20:8 86:10,17  
86:19 88:11 95:13  
105:2 141:1 161:5  
180:10 182:4  
**inert** 30:22 37:19 133:6  
**inerts** 95:21  
**infant** 148:16  
**infestation** 112:19  
**infiltrated** 167:12  
**infiltration** 167:5,10,12

**information** 4:16 20:1  
43:14 53:2 61:19  
76:13 81:14 126:5  
162:12 163:18  
**infrastructure** 183:7  
**ingestible** 181:5  
**ingredient** 172:2  
**ingredients** 64:7 99:1  
143:7  
**initial** 77:14  
**initiate** 94:1  
**Initiative** 90:11 93:8  
**innovation** 19:13 96:10  
97:16 134:13 160:22  
161:4  
**innovative** 32:17 177:2  
**innovator/leader** 182:4  
**inorganic** 111:15,21  
112:4,9,10  
**input** 20:22 22:9 24:1  
90:4 132:22 135:13  
141:15 142:20 143:3  
169:3  
**inputs** 13:14 14:2 20:19  
21:14 23:1 133:6,8,12  
143:12,13 144:13  
145:2 154:11  
**inserted** 166:20  
**insertional** 168:4  
**insinuate** 121:4  
**insoluble** 144:17,22  
145:3,4,11,21  
**inspection** 103:2 107:7  
**inspections** 30:13  
**inspectors** 106:18  
**installed** 159:14  
**instance** 78:1 144:9  
**instances** 175:6  
**Institute** 132:6  
**instruments** 124:6  
**insufficient** 88:6  
**integrity** 30:16 66:4  
96:21 104:14 115:14  
**intended** 95:15 96:4  
97:12  
**intensity** 104:2  
**intention** 82:7  
**intentional** 64:22  
**interchange** 54:15  
**interest** 19:5 69:6 71:7  
80:4  
**interested** 40:12 108:10  
163:18 165:10 179:15  
**interesting** 98:10  
**interests** 18:17  
**Intergenesis** 166:12,21  
**intermediary** 113:9  
**internal** 109:2

**international** 52:7 99:8  
169:16 172:3  
**interpret** 35:13 96:14  
**interpreted** 23:14  
**interrupt** 74:16,20  
**interval** 24:16,21  
**intragenesis** 26:19 27:9  
63:20 64:19,21  
**intrigued** 108:18  
**introduce** 28:17  
**introduced** 25:16  
167:11  
**introducing** 167:6  
**introductory** 6:15  
**introns** 28:3  
**invented** 24:7 176:11  
**invertebrates** 72:7  
**invest** 51:4  
**investigated** 38:10  
**investigating** 61:1  
**invitro** 28:22  
**involve** 64:21  
**involved** 77:13 115:18  
**involves** 28:19 110:20  
166:13  
**ionic** 68:12  
**ions** 60:2  
**irrigate** 18:4  
**irrigation** 147:5  
**issue** 5:20 36:1 57:4  
63:14 71:8 73:11  
85:14 100:5,6 119:3,9  
159:9 163:11  
**issue's** 177:5  
**issues** 6:9 26:8 36:1  
52:20 71:15 86:7,22  
87:4,5 88:12 92:17  
93:11 97:2  
**items** 90:5 135:13  
142:20 143:3,9,10

## J

**Jackie** 109:10  
**Jacksonville** 4:17  
15:11  
**jam** 175:14  
**January** 14:22  
**Jaydee** 27:18 147:19  
158:6 165:20,21  
166:5 168:22  
**Jeff** 48:7  
**Jennifer** 11:12,13,17  
173:19  
**Jesse** 1:14 8:21,22 9:6  
9:11 11:1,3,7  
**job** 116:6,6,19 183:14  
**Joelle** 1:17 9:20,22  
**John** 100:21

**joke** 174:1  
**Journal** 47:13  
**juice** 171:13  
**Julene** 172:13 173:17  
**jump** 138:12  
**junction** 102:18  
**justification** 14:16  
 18:12

---

**K**


---

**Karen** 114:11 115:1  
 131:14,16,18,19  
 132:2,5 135:10,11  
 136:4 138:9 142:2  
**keep** 6:12 11:5 33:13  
 43:3 78:22 96:16  
 106:11 140:19 141:2  
 150:10 161:15 168:17  
**keeping** 106:11  
**kelp** 71:9 95:10  
**kelps** 72:2  
**kept** 78:7 107:11  
**Ketchel** 66:17 70:17  
 74:8,11,21 75:2 77:16  
 78:4 79:2 80:3 82:1,4  
 82:12 83:21 84:2,20  
**key** 13:2 86:9  
**kilogram** 48:5  
**kilometers** 77:9  
**kinds** 28:12 120:4  
**Knott's** 126:3  
**knowledge** 61:21 155:9  
**knowledgeable** 80:8  
**known** 71:8  
**Koslowski** 172:13  
 173:17  
**Kristen** 95:4 101:8,8,10  
 101:11,14,16 106:9  
 110:1  
**Kyle** 89:13 95:4 101:5,6  
 101:6,7

---

**L**


---

**lab** 39:3 144:11 145:22  
**label** 19:15 34:20,22  
 35:3 37:7 48:15 49:12  
 58:4,7 119:15,16,21  
 120:14 121:1,6  
 122:22 123:4,8,10  
 134:1  
**labeling** 35:18 57:7  
 105:4 108:11 134:1  
**labels** 19:14 121:4,5  
**labile** 152:7  
**labor** 52:9 68:5 140:19  
 150:5,7 154:1,3,5,8  
 154:22 155:1,6 159:1  
 176:21

**lack** 15:15 24:1 47:10  
 121:16  
**land** 16:19 19:8 25:12  
 51:21 77:7 123:12  
 132:17 134:5,7 135:1  
 135:1,3  
**landfilling** 177:1  
**landfills** 86:11  
**language** 27:3  
**large** 25:4 49:4 77:7  
 81:2 111:20 126:15  
 126:18 132:14 134:3  
 140:11,11  
**larger** 23:9 52:5  
**largest** 37:17 51:11  
 75:20 76:9  
**lastly** 19:20 65:5 141:22  
**late** 30:16 63:6  
**latest** 91:6  
**launch** 12:19  
**lava** 56:7,8,10  
**law** 84:4 180:22  
**lead** 43:14 171:9  
**leader** 50:22  
**leafy** 12:12 16:16 38:21  
 112:3  
**learned** 20:1 57:14  
**leave** 142:4  
**leaves** 167:11  
**left** 15:5 22:2 92:1  
**legal** 139:8  
**legislations** 150:8  
**legumes** 130:16  
**Leonard** 112:1  
**let's** 97:2 134:18 161:15  
**lettuce** 16:16 17:2,6  
 25:10,17 111:21  
 112:7 141:16  
**lettuces** 12:12  
**level** 38:18 39:14,14  
 60:6 68:1 83:17  
 112:18 153:18 155:4  
**levels** 37:15,19 38:13  
 145:3  
**Lewis** 2:2 3:9 4:3,4  
**life** 18:6 38:1,1,13,18  
 39:2 81:15 97:8  
 104:11  
**Life-support** 38:9  
**light** 103:11,14,18  
 104:3,3,5,9,10 110:16  
**Lima** 1:16 9:14,15  
**limit** 28:12 102:12,14  
**limitation** 118:22  
**limitations** 33:10 104:3  
**limited** 132:18,21,22  
**limiting** 103:10  
**line** 8:9,21 9:20 11:14

26:1 36:8 46:1,5 50:2  
 50:15 53:19 62:18  
 66:18 70:18 74:10,19  
 88:22 89:2,5,7,12  
 94:17,19 101:5,8,13  
 110:2 114:12 124:15  
 131:17 138:13 147:14  
 158:7 165:21 166:1  
 172:17,18  
**lines** 28:8  
**Lipson** 88:21 89:4,7,9  
 89:18,18 92:9 93:3  
 94:9,14  
**liquid** 54:13 68:10,15  
 87:16,17 88:9 102:13  
 105:10,16 106:1  
 125:13 145:7,11,14  
 145:21 146:18,20  
 147:2 149:19 154:11  
 155:5,5,16  
**liquidize** 55:2  
**Lisa** 1:16 2:3 9:14  
**list** 2:3 6:17 8:2 11:17  
 26:20 30:8 43:3 63:19  
 64:13 66:7 76:8 79:6  
 82:20 91:14 96:5,8,17  
 96:18 97:15 128:10  
 128:14 129:3,13  
 135:13 142:20 143:3  
 170:5 172:7 173:18  
 176:17  
**listed** 26:15 27:14  
 65:14 162:20 163:4  
 164:13  
**listening** 133:19  
**listing** 29:8 171:3  
**literature** 37:21 40:8  
**little** 21:4 46:19 47:3  
 49:2 61:15 70:3,5  
 74:17 75:6 80:1 84:11  
 84:13 94:20 108:16  
 110:16 125:13 127:12  
 127:21 128:7 154:13  
 162:17 165:5,8  
**live** 22:21 56:7  
**lived** 46:20 128:10  
**lives** 152:22  
**living** 97:7  
**local** 12:12  
**located** 22:17 112:17  
**location** 160:16 164:13  
**logical** 72:14  
**long** 78:6 86:2 115:18  
 119:5 160:15 164:15  
**longer** 156:19  
**look** 4:22 24:10 41:20  
 73:10 106:4,22  
 108:15 119:10 130:6

141:13 177:3 183:10  
**looked** 40:16 43:7  
 75:10 141:7  
**looking** 6:7 82:8 91:13  
 98:12 106:13 117:5,6  
 121:10 131:4 135:2  
 141:12 142:21 151:22  
**looks** 5:19 9:6 23:19  
 114:15 138:10 145:14  
 154:5  
**lose** 5:15 32:13 122:13  
**losing** 11:5 51:5  
**loss** 44:20  
**lot** 31:16 53:2 56:7  
 58:16 59:10 93:15  
 117:19 121:20 122:2  
 123:14 124:11 133:4  
 136:20,21 137:2  
 139:1,2 141:9 153:7  
 155:11 156:11 160:20  
 169:4 178:2 182:3,10  
 182:10  
**lots** 76:14,15 77:22  
**love** 134:4  
**low** 25:4 49:2 144:16  
 145:12 146:1,3  
**lower** 52:9 112:18  
 176:5  
**lowering** 47:20 96:1  
**lump** 15:17

---

**M**


---

**ma'am** 10:3  
**machine** 72:11 175:13  
 176:10  
**machinery** 175:14,15  
**main** 67:10 69:18  
**Maine** 115:7 119:6  
**maintain** 73:5 77:2  
 126:19  
**maintains** 22:11  
**maintenance** 71:19  
**major** 36:1 76:8 171:5  
 181:1 182:3  
**majority** 140:10,12  
 141:20 147:4,4 149:5  
 171:12  
**makeup** 24:6  
**making** 54:19 181:17  
**mammals** 43:19  
**man** 115:3  
**manage** 67:3 92:3  
 124:2 136:6 148:8  
**management** 45:13  
 121:15  
**manager** 2:3 42:17  
 109:9 147:22 150:13  
**managing** 116:19

121:15 136:12  
**mandate** 124:4  
**mandates** 117:14  
**Mani** 46:9 50:5,9,11,14  
**Manico** 89:14 95:4  
 101:5  
**manipulate** 153:19  
 155:4  
**manipulated** 27:7  
 153:18 155:16  
**manipulating** 154:8  
**manipulation** 28:22  
**manual** 52:9  
**manufacturers** 139:16  
 181:2  
**manufacturers'** 158:13  
**manufacturing** 179:9  
**manure** 21:19,20 87:5,6  
 87:8,8,9 88:3  
**manuring** 117:3  
**Marc** 66:17 70:17 74:8  
 74:9,12,15,20 75:2  
 77:21 81:17,18  
**March** 17:2  
**marine** 71:8,8,13,18  
 72:3,5,18 73:3,6,9  
**mark** 7:15 88:21 89:4,8  
 89:11,15,18 92:7,14  
 94:3,5,12 158:6  
 163:21 165:20 169:7  
 169:8,11,15  
**marked** 64:15  
**market** 35:14 52:7  
 77:13 167:3  
**marketplace** 34:19  
 37:14 75:12 121:3  
 123:1,5,9  
**Martens** 169:8 172:13  
 172:17 173:20 174:3  
 174:5,12,12 177:22  
 178:14 179:2,11,20  
 181:8,18 182:21  
**Marti** 12:3 16:9 25:21  
 25:22 26:5 29:11  
 166:10  
**mass** 164:8 179:16  
**master's** 12:17  
**match** 41:6  
**material** 26:13 44:15  
 80:11,12,17,17 81:11  
 93:15 135:13 142:20  
 143:3 155:5,6 163:12  
 166:20 176:4 178:3  
 179:19 180:4,17  
**materials** 2:5 35:8 43:4  
 63:13,16,18 71:8,13  
 71:18 79:7 93:12  
 96:16 97:2 98:17

128:12 129:16 164:5  
 165:14 178:3 180:13  
**MATT** 2:5  
**matter** 13:17 14:11 80:7  
 149:20 157:1 175:16  
 177:13 183:15  
**matters** 7:7  
**maximum** 126:10  
**McDonald** 42:11 46:5,6  
 46:13,14  
**McELROY** 2:6  
**McEvoy** 31:7  
**meal** 43:15 44:7 127:2  
**meals** 127:2  
**mean** 20:17,20 24:21  
 41:6 60:21 61:11  
 68:11 76:13 78:10  
 80:19 82:12,13,16  
 105:15 107:9 136:18  
 138:1,2 150:20  
 153:22 154:2 155:14  
 155:21 156:22 178:16  
 181:20  
**meaning** 69:18 121:10  
 144:16  
**meaningful** 149:11  
**means** 168:6  
**meant** 139:10  
**measure** 116:1,8  
 136:18 144:8  
**measured** 39:3  
**measurement** 102:19  
 103:7  
**measurements** 137:4  
**measures** 49:6  
**measuring** 100:7  
 123:20 127:15,19  
 129:22 130:1,5,21,21  
 130:22 131:2  
**mechanical** 74:1 150:4  
 154:2  
**mechanism** 54:18  
 167:22  
**media** 21:7 143:6,14  
 146:6,8,12 154:9  
 171:12  
**medium** 30:22 38:5  
 41:21 53:2 60:4 61:4  
 69:13 145:19  
**meet** 91:3 144:3 154:20  
 159:17,22 182:8  
**meeting** 4:7,10,12,17  
 5:13 8:5 14:21 18:19  
 19:17 31:5 91:17,18  
 93:19 95:18,22 118:7  
 183:10  
**meetings** 4:19  
**meets** 13:1 72:22

159:10  
**member** 3:14 151:17  
**members** 1:12 4:6 7:2,9  
 11:10 13:8 50:19  
 52:14 55:5 67:6 88:11  
 108:2 182:22 183:3  
**memo** 29:2 158:15  
 159:21 162:20 163:4  
**mention** 150:5  
**mentioned** 16:14  
 106:10 142:2 153:5  
**merely** 163:6  
**message** 7:2 53:20  
 114:21  
**metal** 39:10  
**metals** 171:9  
**meter** 164:4,8 179:17  
 179:18  
**method** 16:18 20:9  
 27:16 29:5,10 30:18  
 39:1 43:10 73:22  
 100:9 110:20,20  
 167:2,4,5 168:9  
**methods** 19:18 20:8  
 26:15,16,20,22 27:4,5  
 27:20 30:9 31:4 32:2  
 33:15 35:22 39:1,6  
 63:11,17,19,22 64:14  
 65:10,14 88:2 112:5  
 120:3 163:5 167:1  
 168:6  
**mic** 85:11  
**Michael** 42:10 46:7,8,10  
 46:13 49:19  
**Michelle** 2:2 3:15 4:3  
 6:1 7:14 8:6 36:12  
 53:20 74:17 94:7  
 163:22  
**micro-biomes** 112:6  
**microbes** 40:1,4,18  
 149:20 156:22  
**microbial** 111:19 113:3  
**microbiome** 38:3,12,17  
 41:12,20 111:3  
**microbiomes** 113:13  
**microcrystalline**  
 162:16  
**micronutrients** 21:2  
 22:7,13  
**microorganisms** 55:1,8  
 111:4 130:18 177:12  
**middle-aged** 51:19  
**Midwest** 101:17  
**Mike** 46:5  
**miles** 17:5,7 31:7 77:8  
**military** 132:10  
**Miller** 42:18  
**milligram** 48:6

**milligrams** 164:8  
 179:17  
**milling** 171:15  
**million** 43:18  
**mind** 109:6 120:14  
 121:12 125:16 140:20  
 141:3  
**mindful** 135:7  
**mineral** 169:21 178:19  
**mineral-** 30:18  
**mineral-nutrient** 30:21  
**minimum** 68:7 75:18,19  
**minority** 33:1  
**minute** 7:12,15  
**minutes** 7:13 86:3 88:6  
 96:3 102:8 158:4  
 182:19  
**Miraj** 88:21 89:11,13  
 94:15 173:20  
**misinformation** 15:15  
 133:5,9,18  
**missing** 121:9  
**mission** 159:3  
**misuse** 182:3  
**mix** 152:7 156:18  
**mixed** 126:16 146:19  
 149:15  
**mixing** 28:19  
**mixture** 127:1  
**mixtures** 160:6 161:2,6  
**mobile** 167:17  
**model** 38:11  
**moderate** 154:19  
**modern** 64:17 65:2  
 159:8 162:13 167:14  
**modification** 28:1  
 64:22 110:20  
**module** 138:21  
**MOFGA** 115:19,21  
**moisture** 87:12,19  
**molecules** 54:16 111:5  
**Molino** 89:19  
**mom** 140:13  
**moment** 16:8 50:9 95:3  
**money** 160:21  
**monitoring** 112:17  
**monograph** 171:8  
**months** 47:1 81:11  
**morning** 80:7  
**Mortensen** 9:19  
**MOSA** 101:16,22  
 103:15 104:18,19  
 105:9 107:2  
**moss** 70:1 146:7,13  
**Mosso** 1:17 9:20,21  
**Mother** 37:8  
**mothers** 117:8  
**move** 8:1 28:7 36:5

62:14 67:1 70:14  
101:3 114:9,20  
127:12 131:10 138:11  
158:3 172:16  
**moved** 27:7  
**moving** 11:8 25:20  
26:21 46:5 62:15  
66:15 173:17  
**muddled** 20:7  
**mulch** 95:21 158:13,15  
158:18,21 159:4,5,7  
159:14,16,21 160:7  
160:22 174:16 175:2  
175:9,12,17,18,22  
176:9,16,17 177:8  
179:16 180:12 181:21  
182:6  
**Mulches** 158:19  
**multiple** 13:7 87:22  
**multitude** 54:7  
**munchable** 179:10,13  
**mutagens** 168:5  
**mutations** 168:5  
**mute** 6:12,13 8:15 9:3,8  
74:19 78:22 85:6  
87:21 89:10 94:21  
98:13 99:21 114:14  
114:16 118:13 136:1  
**muted** 5:20 85:11,14  
131:18  
**mutual** 51:21 153:5  
**mycorrhiza** 142:1  
**mycorrhizae** 55:6,14  
60:21 61:3 62:10  
**mycorrhizal** 61:9

---

**N**


---

**Nagelhout** 11:13 12:3  
16:3,5,12,13 21:13  
23:4,12 24:19  
**NALLY** 2:4  
**name** 7:5 10:13 12:5,8  
16:10 26:4,5 30:2,4  
36:17,18 42:14,16  
46:11,13 50:11,13  
54:1,3 63:3,7 66:22  
67:3 70:21 74:13 75:2  
89:16 95:5 101:15  
110:9 115:5 132:3,4  
138:15 147:20,21  
158:10,11 166:4  
169:12 174:10  
**name's** 138:16  
**named** 112:1  
**NASA-controlled** 38:8  
**national** 1:3,9 2:3 4:5,8  
4:12,20 5:8 26:15  
50:20 73:9 96:5,8,17

96:18 97:15 109:1  
128:10,13 129:3  
170:5 172:6,8 176:16  
183:5  
**native** 28:4  
**natural** 13:15 14:9,13  
17:22 18:5 22:12,15  
22:20 24:2 28:1 71:20  
98:17 140:18 157:20  
**naturally** 48:6 167:16  
**nature** 56:6,11 107:6  
164:22  
**necessarily** 60:3  
113:11  
**necessary** 157:19  
**need** 15:2 19:12 32:14  
32:16 35:2,9 41:8  
44:1,3,8,12 45:6,11  
57:18 59:13 62:2  
76:12 84:10,11 86:21  
90:21 91:18 96:22  
97:14 103:4 104:9  
106:4 125:8 135:7  
150:9 152:14 154:16  
154:20 155:22 157:18  
160:9 173:2  
**needed** 39:18 102:10  
157:8  
**needs** 13:17 14:11  
32:19 35:18,20 39:16  
68:3,15,16 90:17 91:4  
91:17 125:8 145:6  
149:17 150:18  
**negative** 86:15  
**nervous** 116:1 121:2  
128:3 130:6  
**never** 17:15 133:11  
140:3 182:15,15  
**Nevertheless** 31:19  
**new** 16:15 28:13 32:16  
38:22 39:5 41:16  
44:11,15,18 48:12  
64:3,10 65:9 66:6  
68:1 134:15 149:10  
175:9,19 176:18  
179:6 180:10,11  
**NFT** 136:22  
**NGOs** 95:12  
**nice** 180:10  
**nine** 112:14 160:2  
**nitrate** 38:20 39:1,6  
47:15,16,18,22 48:7  
95:20 111:12 118:1  
125:20 128:8,9,20  
**nitrate-stimulated**  
28:18  
**nitrates** 39:7 47:10 48:3  
106:14 156:12

**nitrification** 22:16  
111:9 157:3,17  
**nitrogen** 68:3,10,13,13  
68:16 100:8 102:12  
102:14 103:8 106:12  
107:17 125:2,3,8,17  
125:21 126:6,8  
130:16 136:12,13  
143:22 144:1,8,12,15  
144:16,21,22 145:4,5  
145:8,11,12,20 146:2  
146:5,18 148:11  
149:7,7 150:21  
151:20 152:7,8,21  
153:8,13,18,20  
154:10,16,20 155:4  
155:10 156:19 157:2  
157:8,18 178:19  
**nitrogenous** 111:11,12  
**nitrogens** 152:6  
**noise** 74:18  
**non** 132:16 155:5  
171:14  
**non-** 43:8  
**non-GMO** 21:17 83:17  
83:17  
**non-metallic** 169:21  
**non-organic** 17:16  
**NOP** 4:14,15 13:5 15:1  
15:1 18:13 19:4 22:8  
29:2 30:17 31:1 32:5  
37:6 72:18 86:20  
90:17 93:12 117:15  
117:22 119:18 124:1  
**NOP's** 79:6  
**normal** 28:4  
**normally** 78:8  
**North** 174:13  
**NOSB** 2:3 5:1 7:9 15:4  
15:10,12 26:21 30:6  
31:5 64:6,10,16 66:5  
71:12 92:16 93:11  
95:14 109:7 115:11  
115:13,16 129:1,4  
133:12 168:11 170:4  
171:1 172:4 176:15  
**NOSB's** 65:1  
**note** 55:4 65:5,17 116:7  
**Novamont** 174:13  
**novel** 166:21  
**November** 4:12 17:2  
64:5 71:13  
**NST** 111:21  
**nucleic** 29:1 167:6,10  
167:13  
**nullify** 32:5  
**number** 7:2 24:15,20  
25:16 40:1 51:19 52:1

98:20 103:11 114:18  
116:12 173:10,13  
**numbers** 103:16  
**nursery** 146:8  
**nutrient** 16:21 20:18,21  
20:22 30:19 60:15  
61:7 104:4 111:17  
112:11 149:5,22  
**nutrients** 13:16 14:10  
14:15 22:14 54:10,15  
54:18,19 55:1,3 59:21  
60:10,13 61:10 86:12  
113:9 123:21 124:2,5  
127:4 145:7 147:2  
178:20  
**nutrition** 47:14 110:22  
111:6,15 150:13  
152:9  
**nutritionist** 45:6

---

**O**


---

**Oakley** 1:18 10:1,2  
24:14 25:18 33:19  
34:3,8 73:19 92:14  
98:8 162:7  
**objectives** 88:4  
**obligatory** 111:15  
**observatory** 90:9 91:21  
**obviously** 75:15 138:21  
156:22  
**occasions** 140:3  
**occur** 55:12 98:21  
**occurring** 4:17 19:7  
167:16  
**occurs** 144:19  
**October** 1:7 4:11 26:11  
**offer** 12:13 86:9 122:12  
**offering** 90:4  
**office** 166:8  
**Offices** 93:20  
**officials** 91:8  
**offsite** 46:18  
**OFPA** 115:20 117:14  
118:8 139:6,7,9,13,18  
154:4 155:2  
**OFRF** 90:2  
**oil** 171:15 177:4  
**oils** 171:16  
**okayed** 176:20  
**old** 12:16 51:15 176:10  
179:5  
**older** 117:1  
**once** 46:4 89:4 101:6  
128:17 143:10 172:15  
**one's** 20:6 161:17,18  
**one-off** 60:14 61:13  
**one-tenth** 16:19  
**ones** 119:14 133:12

154:11 163:5  
**online** 94:16 109:12  
**open** 7:19 97:16 182:2  
 182:2  
**opening** 3:11 120:7,21  
**operate** 4:20  
**operated** 112:10  
**operation** 31:17 69:14  
 126:16 148:9 150:4  
 151:2  
**operations** 31:9 49:5  
 102:1 128:15 140:12  
 151:3  
**opinion** 57:11 82:11  
 105:21  
**opinions** 57:10  
**opponents** 133:14  
**opportunity** 35:14 42:8  
 42:22 69:5 75:1 99:18  
 101:1,18 119:12  
 158:12  
**opposed** 138:22  
**opposite** 118:20 142:13  
**opt** 79:8  
**optimal** 153:20  
**option** 43:6 79:17  
**orange** 131:2,3  
**order** 6:16 44:2,3,10  
 66:5 167:7  
**OREI** 90:15 91:11 93:10  
**Organic's** 159:3  
**organically** 51:1 54:6  
**organics** 39:3,16 67:15  
 83:15 98:3 141:3  
**organisms** 22:21 111:9  
 142:12 168:4  
**organizations** 119:4  
**orientation** 28:5  
**original** 117:7 120:14  
**originally** 82:8,20  
**OSP** 108:17 109:11  
**ought** 23:13  
**outperformed** 112:8  
**output** 144:19  
**Outright** 46:22  
**outside** 43:22 45:2  
**overall** 48:12 90:6  
 111:7  
**overcome** 51:14 107:4  
**overly** 97:12  
**oversight** 76:8  
**overspray** 17:16  
**oyster** 22:10  
**ozone** 133:13

---

**P**

**P-R-O-C-E-E-D-I-N-G-S**  
 4:1

**p.m** 1:10 4:2 183:16  
**painful** 99:4  
**Panel** 72:8,9,10  
**papers** 87:22 88:1  
**paradigm** 96:18 100:18  
**parameters** 126:20  
**paraphrase** 137:14  
**paraphrasing** 139:12  
**parse** 41:18 100:5  
 155:19  
**part** 26:9 63:13 82:16  
 93:9 98:3 117:20  
 138:1 155:2  
**PARTICIPANT** 34:15  
 83:1 172:21 173:5,11  
 173:14 174:1  
**particle** 142:11  
**particles** 60:1  
**particular** 75:16 109:7  
 126:6 139:13 150:17  
**particularly** 51:7 82:10  
 139:4 150:3  
**partly** 47:2  
**partner** 89:19  
**partnership** 132:7  
**pass** 33:12  
**passed** 32:11 91:22  
**passionate** 12:20  
**paste** 167:22  
**pasteurization** 87:20  
**pasteurize** 88:5  
**pasteurized** 87:11  
**pasture** 106:20 107:5  
**pastures** 106:22  
**Patel** 88:21 89:12 94:16  
 173:20  
**pathogen** 87:21 88:7  
**pathogens** 17:17  
**pathologist** 50:16  
**PATTILLO** 2:5  
**Paul** 2:2 3:9 4:4 5:11  
**PAVONE** 2:5  
**peat** 70:1 146:7,13  
**peer-reviewed** 87:22  
**pending** 16:15  
**people** 28:11 34:2,5  
 47:6 80:8 84:3,15  
 98:21 107:4 117:3  
 118:20 119:3,8,22  
 120:2 121:20 125:12  
 129:4,6 134:4 137:20  
 139:2 141:1 145:18  
 156:17  
**people's** 121:12  
**percent** 16:19 17:2  
 18:22 19:3 82:2 84:9  
 87:12,18,19 102:11  
 102:13 105:10,16

106:15 125:2,7,17,21  
 128:6 145:20 146:4  
 146:18 148:10,22  
 149:1,16 150:21  
 155:10 156:1,8  
 159:10 160:2 162:13  
 162:14 163:2,13  
 175:18 180:3,19,22  
 181:2,15,21 182:6  
**percentage** 70:8 132:14  
 162:15  
**perennial** 68:2 150:12  
 150:15 151:3 153:1  
**perennials** 150:19  
**Perfect** 85:19  
**perform** 159:18 160:6  
 182:8  
**performance** 31:20  
 112:6 160:14  
**period** 6:19 87:2  
**perlite** 70:1  
**Perlis** 46:8 49:21,22  
 62:17,18,19,22 63:5,7  
 66:10  
**permits** 6:20  
**permitted** 65:18,19  
**person** 95:14  
**personal** 91:21  
**personality** 119:11  
**personally** 5:3 58:5  
 155:22 156:13  
**perspective** 119:1  
 120:5  
**pertaining** 7:7  
**pest** 90:14 112:17,19  
 143:6,13  
**pesticide** 49:1 75:13  
 130:7  
**pesticide-free** 52:12,16  
**pesticides** 35:6 76:22  
 80:21,22 82:8  
**petrochemical** 177:7  
**petroleum** 159:10  
 161:21 162:2 177:18  
 178:3,16  
**petroleum-powered**  
 17:12  
**pH** 22:11  
**pharmaceutical** 171:18  
**pharmaceuticals** 167:9  
**Pharmacopeia** 171:6  
**PhD** 48:8  
**philosophically** 83:6  
**philosophy** 97:17  
**phone** 7:1 9:7 11:18  
 85:5,9 173:9  
**phosphate** 70:2  
**photo** 73:20 159:13

**physical** 113:10 114:3  
 154:10 160:6  
**picture** 134:3  
**pictured** 176:10  
**piece** 108:14  
**pieces** 168:3  
**place** 93:14 96:16  
 102:19 113:21 120:22  
 133:10  
**places** 135:2  
**plan** 109:2 135:14,17  
 143:4  
**planet** 122:5,13  
**plankton** 169:22  
**plant** 17:22 21:10 24:18  
 28:1,2,16 29:3 38:18  
 40:20 50:16 60:1 61:4  
 61:7,10,12 68:4 71:9  
 78:9,10,11,15 103:9  
 104:11 111:6 112:6  
 122:14 141:13 142:7  
 148:15,20 149:18,22  
 150:12,15 152:10  
 156:5,5,6 157:1  
 166:14,16,17,18  
 167:6,11 169:22  
 175:16 176:2 177:8  
 180:4,6,13  
**plant's** 102:12 149:5,16  
 157:3  
**planted** 102:15  
**planting** 136:13 148:12  
 149:15 155:11 156:9  
**plants** 21:6,15 22:14  
 23:9 30:18,20 38:3  
 55:3 56:9 60:10 65:13  
 65:21 68:12,14 72:12  
 103:12,17,22 104:4  
 107:18 111:1,14,16  
 112:20 113:7,16  
 150:10,16,22 152:4  
 153:6,13,17,21 155:4  
 156:10 157:18 167:8  
 167:19 177:14,19  
 178:4  
**plants'** 104:6 177:9  
**PLAs** 182:9  
**plastic** 175:12,13 176:1  
 176:5 177:1 180:18  
**plastics** 174:19  
**play** 111:4  
**playing** 115:21  
**plays** 41:13  
**please** 4:15 6:11 19:22  
 24:15 30:2 37:22  
 38:20 53:20 78:22  
 84:1 85:5,9,10,16  
 174:15 175:11,20,21

175:21 176:6,6,7,13  
176:13,14,17 177:2,9  
**plentiful** 38:17  
**plug** 147:1,3  
**plus** 113:21 140:7  
180:18  
**point** 23:11 43:11 54:9  
82:11,21 117:19  
122:16,20 123:11  
129:17 142:9 158:13  
**points** 13:2  
**policies** 83:19,19  
**policy** 2:5,6 89:20 90:1  
109:9 166:6  
**politics** 57:21  
**pollination** 83:11  
**pollution** 67:17  
**Poly** 132:8  
**polyesters** 182:10  
**polyethylene** 159:4  
174:19  
**polymer** 161:21 179:9  
**Pomona** 132:8  
**ponder** 41:4 83:12  
**poo** 130:4  
**pooed** 130:5  
**poop** 177:12  
**pop** 140:13  
**popped** 139:20  
**populated** 30:14  
**population** 32:16 35:4  
**porous** 56:8  
**portfolios** 91:2  
**portion** 43:16  
**poses** 18:12  
**position** 127:18 128:12  
**positive** 33:15  
**possibility** 156:20  
**possible** 32:20 59:16  
84:6,9 107:10 127:8  
159:6  
**possibly** 114:14  
**post-** 78:8  
**potatoes** 167:3  
**potential** 47:7 88:12  
**potentially** 160:10  
**pots** 150:2  
**potting** 146:7  
**poultry** 42:18 43:18,20  
**pounds** 153:8  
**powerful** 98:3  
**PowerPoint** 172:19  
**practical** 81:14 103:22  
**practically** 104:14  
**practice** 81:20 97:10  
116:7,22 130:22  
174:18 176:9  
**practiced** 7:15

**practices** 14:17,19 18:1  
18:14 39:18 45:14  
67:13 69:1,2 93:12  
97:7 104:22 116:10  
116:11 117:10 130:14  
130:17 131:5 134:8  
160:15  
**pre-harvest** 81:21  
**preamble** 128:22  
**precautionary** 97:18  
**precedent** 117:22  
**preclude** 139:14 142:11  
**predominantly** 170:1  
**premium** 35:2  
**prepare** 4:10  
**preparing** 5:1  
**prescribed** 163:5  
**prescriptive** 67:12  
68:22  
**presence** 55:22  
**present** 1:12 2:1 6:17  
8:7 9:13 10:2,5 11:10  
55:14,21 79:19 152:8  
158:12  
**presentation** 46:20  
95:15 172:19  
**presented** 31:21 32:10  
95:13 170:15  
**presenting** 26:6  
**preserve** 66:3  
**president** 46:15 50:14  
51:20 110:12  
**presiding** 1:10  
**pressure** 25:4 47:19,19  
**pressures** 73:8  
**presume** 20:19  
**presumptively** 112:20  
**pretty** 93:6 99:4 115:11  
153:12 169:4 179:20  
180:9,15  
**previous** 14:7 20:3  
28:22 106:14 162:8  
168:21  
**previously** 15:18 168:7  
**priced** 159:19  
**primarily** 55:12 143:9  
**primary** 118:6  
**principle** 59:22 97:12  
97:18 117:12 118:9  
**principles** 27:11 69:3  
96:15 116:14  
**prior** 5:13  
**priorities** 90:8  
**priority** 73:10  
**probably** 5:20 45:8,11  
60:13 85:13 98:18  
118:19 119:17 143:8  
148:18 180:2,3,5

181:1,2  
**probe** 130:6,9  
**problem** 34:11 45:1  
50:20 51:2 52:19 58:6  
72:21 75:12 97:1  
122:12 137:21 138:8  
159:20  
**problematic** 122:4  
**problems** 47:8 48:21  
98:20 100:11  
**proceed** 49:20 50:12  
54:1 63:4 70:22 74:14  
**process** 44:22 78:5,12  
82:17 86:15 90:22  
103:2 107:12 133:10  
157:18  
**processes** 77:8 104:7  
133:2 142:11 171:21  
**processing** 78:8,9,10  
78:15 87:9 172:2  
**processor** 76:4  
**produce** 16:20 28:13  
32:15 46:14 49:11,13  
141:12,16 149:11  
159:1 167:7 176:4,22  
**produced** 22:15 90:13  
93:4,10 105:2 171:4  
**producer** 57:2 76:4  
111:21  
**producers** 76:18 77:12  
82:5 96:20 97:13  
105:22 106:17 107:13  
108:21 113:22 169:17  
169:19 171:5 172:4  
**produces** 48:6 97:6  
**producing** 86:17  
**product** 17:14,19,20  
22:12 72:19 116:9  
144:17 172:1 177:6  
177:20 181:22 182:14  
**production** 13:12,14  
37:13 38:10 39:7,8  
43:5 44:1 48:11 50:15  
51:3,9,12,17,21 52:5  
52:15 67:8 68:11 69:2  
71:18 72:18 81:21  
82:9,14,17 83:10  
91:22 101:19 102:3,4  
102:5,7,20 105:3,13  
105:19 106:4 109:3,4  
110:19 113:18 120:13  
120:18,22 121:14  
122:8,17,21 126:15  
127:7 132:16,20  
133:4,15 134:3 135:5  
144:14,20 145:3  
146:2,11 148:3  
171:16

**productions** 51:18  
106:3 141:14  
**productive** 12:22 13:15  
93:22  
**productivity** 132:21  
**products** 17:8 39:18  
44:11,18 51:1 52:11  
73:4 78:3 164:6  
169:19 171:14 176:21  
177:2 181:17  
**Professor** 48:8  
**profile** 44:13  
**program** 4:6,13 26:16  
38:9 43:17 89:20  
90:12,16 91:4,9,11  
92:5 93:22 126:2  
149:14 172:7 183:5  
**program's** 90:17  
**progress** 61:2  
**prohibit** 32:1 113:19  
**prohibited** 65:8 104:21  
170:6  
**projects** 83:17  
**promote** 97:7  
**promoted** 34:22  
**promoter** 28:4  
**promoting** 35:1  
**proper** 104:10  
**proponent** 138:21  
**proportion** 179:5,13  
**proposal** 13:4,11 14:9  
18:11 26:14 27:1 33:5  
33:12 37:9 63:16  
100:2 102:21 104:20  
108:7 136:6,9,11  
137:6 143:19 148:2,4  
148:10 150:11,18  
151:8,10,21 153:3  
**proposals** 67:9 104:13  
**propose** 52:15 87:3  
**proposition** 51:5  
**proscriptive** 96:12  
106:21  
**protect** 49:6  
**protecting** 115:14  
120:16 124:8  
**protection** 73:8  
**protectionism** 134:14  
134:20  
**proteins** 167:8  
**proud** 58:5  
**proven** 49:8  
**provide** 12:11,21 18:11  
31:1 40:10 58:22  
63:15 72:14 101:18  
113:1 125:7 152:6,9  
153:19 154:7 163:22  
174:16

**provided** 27:1,3 39:9  
53:1 113:10,11 126:9  
156:2  
**provider** 58:6  
**provides** 31:16  
**providing** 4:13 59:4  
68:3 183:6  
**public** 1:5 3:17 4:7,8  
5:1,12 6:16 7:11,22  
18:22 170:15 183:1  
**published** 126:5  
**puffin** 72:8  
**pull** 25:8  
**pump** 25:7  
**pumps** 141:8  
**pure** 75:4 121:11  
**purity** 171:7  
**push** 77:3 85:8  
**put** 6:14 22:7 34:5 52:8  
82:8 84:4 85:5 87:7  
102:21 125:6 154:5  
177:4  
**putting** 21:14,16,19  
24:6

---

**Q**


---

**quality** 47:5 52:11  
69:19 81:2 112:2,15  
113:15 149:12  
**quantifies** 97:11  
**quantitative** 112:16  
**quantities** 81:2  
**Quarterly** 30:17  
**question** 22:4 23:1  
33:18 41:18 56:22  
57:13 59:16 60:21  
77:19,20 78:5,7 79:2  
79:18 81:8,18 83:1,12  
92:10 94:4 98:7,7  
99:20 105:9 106:10  
107:19 108:2 109:17  
122:15 124:12 125:1  
125:16 126:12 129:20  
137:4 142:17,19  
144:7 145:18 151:14  
151:18 152:15,17  
153:15 154:13 155:13  
159:6 162:8 164:2  
168:16 179:15,21  
181:6  
**questions** 7:11,19,21  
15:21 16:2 20:14,17  
23:5 29:12,15 34:14  
36:4 39:21 41:10 42:3  
42:6 45:16,19 49:16  
49:19 53:5,8 56:13,16  
59:14 62:13 66:11,15  
69:7,9 70:13 73:14,17

74:4 88:15,18 93:21  
94:12 98:2,4,6 101:3  
103:3 105:6 107:18  
109:5,7,22 114:7,8  
118:11,17 124:20  
127:11 128:17 131:12  
135:10 138:10 147:9  
148:5,6 151:12 158:3  
161:15,16,17 172:12  
177:17 178:13 183:2  
**quick** 6:7 127:11  
181:10  
**quicker** 126:19  
**quickly** 25:9 69:12  
72:13  
**quit** 12:18 143:10  
**quite** 21:9 62:15 137:15  
156:4  
**quorum** 11:11  
**quote** 13:12 15:3 24:21  
32:21  
**quoted** 13:9  
**quotes** 35:9

---

**R**


---

**raise** 56:19  
**raised** 56:20 82:11  
93:11 118:11  
**raising** 129:9  
**Raj** 94:17  
**Ramirez** 50:10 53:18  
63:2 66:16 67:2,3  
69:15 70:15  
**RAMIRIZ** 66:19  
**ranch** 147:22  
**range** 164:6  
**rapidly** 19:6  
**rate** 74:2  
**rates** 112:14  
**ratio** 45:8  
**rations** 44:14  
**re-** 171:2  
**reach** 88:10  
**reached** 129:17  
**reaches** 17:21  
**reaching** 100:20  
**reacting** 136:19  
**reaction** 79:15  
**read** 95:19  
**real** 6:7 51:13 58:1  
77:10 81:15 121:14  
**realize** 97:17 141:17  
**reap** 161:11  
**reason** 11:6 55:13 62:4  
62:10 118:3  
**reasonable** 67:11 77:1  
159:11  
**reasonably** 159:19

**reasons** 13:22 51:22  
52:4 54:8 58:1 67:9  
67:10 140:19  
**rebuilt** 72:13  
**recalculated** 150:19  
**receive** 30:9 103:14  
**recipe** 160:9,18 164:11  
**recipes** 158:17  
**recipient** 28:1 166:14  
168:4  
**recirculating** 24:20,22  
59:3 113:4  
**recognized** 117:8 129:5  
170:8,19,22  
**recommend** 27:13 33:4  
65:11 88:8 168:11  
**recommendation** 13:8  
15:4,10,14 18:16 19:2  
19:21 32:1 67:8,11  
68:19 103:16 116:17  
117:18,20 120:11,21  
129:1 133:22 140:4  
170:4 172:5,9  
**recommendations** 5:2  
15:6,10 31:21 32:4,10  
33:16 37:10 67:20  
90:3,7,10,20 91:7  
96:1 101:21 124:21  
153:7  
**recommended** 30:7  
171:2  
**reconsidered** 86:21  
**record** 7:6 77:15 78:20  
85:4,7 90:18 92:12  
95:6 106:11 110:10  
138:15 174:11 183:16  
**record-keeping** 102:22  
**records** 107:10 151:6  
**recycled** 124:5  
**recycling** 13:16 14:10  
86:12  
**reduce** 86:16 88:2  
159:1 176:21  
**reduced** 47:22  
**reduces** 47:19  
**reduction** 39:1,6 87:21  
88:7 174:18  
**reference** 33:20 57:5  
163:11  
**referenced** 137:20  
**references** 113:1  
**refers** 27:22  
**refreshing** 24:3  
**regarding** 20:4 31:2  
36:1 90:7 95:20 102:6  
103:10,16 104:2,17  
**regards** 139:7  
**regenerate** 13:17 14:11

**regenerative** 119:21  
**region** 158:19  
**regional** 104:15  
**Register** 18:18  
**regs** 99:11  
**regular** 79:20  
**regulate** 129:11  
**regulated** 151:5  
**regulating** 117:21  
**regulation** 31:16 44:1,2  
44:5 79:22 106:20  
117:15 124:4  
**regulations** 31:3,18  
33:7 35:12 36:2 86:21  
88:4 96:11 117:22  
131:6  
**regulatory** 159:17  
**Reiter** 147:22  
**related** 86:4,7,22 87:5,6  
88:12  
**relates** 121:11,15 137:6  
**relating** 71:12  
**relationship** 58:18 80:6  
93:13  
**relationships** 142:6  
**relative** 124:21  
**relatives** 166:19  
**release** 156:19  
**released** 144:18  
**relevant** 7:5,7 16:10  
26:4 30:2 36:17 42:14  
46:11 54:1 74:13  
95:22  
**relies** 15:15  
**rely** 50:22 54:22 55:2  
57:14  
**relying** 13:15  
**remain** 19:3 27:5 69:2  
107:18  
**remaining** 149:1  
**remains** 169:22 170:22  
**Remarks** 3:11  
**remember** 6:12 97:4  
128:18 182:7  
**remind** 19:20 23:6  
**reminder** 74:18 78:22  
168:17  
**removal** 72:11 171:21  
176:15  
**remove** 143:10  
**removed** 72:16  
**removing** 122:6 168:3  
**renewable** 86:17  
179:22 180:18,19  
**renewal** 99:14  
**replace** 44:12 159:3  
**replacing** 180:17  
**replenish** 117:10,16

118:9 130:14  
**replenishing** 116:22  
 117:14  
**report** 37:18 79:14 93:9  
 94:7  
**reports** 138:3  
**repot** 150:21  
**representative** 76:16  
**represents** 169:18  
**request** 76:3,11 77:10  
 91:10 95:19  
**requests** 96:4  
**require** 22:14 68:4 88:6  
 96:7 99:12 107:11  
 148:10 149:6 151:20  
 160:19  
**required** 21:21 56:11  
 75:22 76:5 79:22 88:5  
 146:13 155:9 160:13  
 176:9  
**requirement** 56:1 68:6  
 99:17 102:22 106:14  
 106:21 107:17 118:8  
 125:2,4,21 126:6  
 144:4 148:11 149:17  
 151:4,20 153:13,13  
 155:10 160:1  
**requirements** 102:12  
 102:19 103:9,20  
 104:16 108:17 150:19  
 152:21 153:6 159:17  
 171:7,9 182:11  
**requires** 15:3 83:18  
 154:3 162:21,22  
 163:2,12 176:4  
**requiring** 180:16  
**research** 36:20 43:12  
 43:13,14,21 44:8 45:3  
 61:13 62:6 71:2 85:20  
 89:21 90:3,7,11,12,14  
 90:17 91:2,8 92:1,4,5  
 92:18 93:5,7,19  
 103:19 104:12 133:20  
 153:10  
**researched** 62:6  
**researchers** 73:7  
**reside** 132:22  
**residue** 130:7,15  
**resilient** 37:8,12  
**resources** 68:5 132:18  
 140:18 141:20  
**respect** 7:16 93:12  
**respected** 50:19 52:14  
**response** 5:17 9:2,5,9  
 11:15 15:22 29:13  
 42:4 45:17 46:2 49:17  
 53:6 56:14 66:13  
 73:15 74:5 88:16

**responsibility** 97:19  
**responsible** 54:19,20  
 104:5  
**rest** 94:8 134:7  
**restate** 154:12  
**restating** 163:6  
**restrict** 97:13 128:12,14  
**restriction** 87:7 128:10  
**restrictions** 31:12 87:1  
**result** 90:16  
**resulting** 113:15  
**results** 28:9 90:13  
 166:21  
**retain** 170:5 172:6  
**retrieve** 56:9  
**reveal** 37:20  
**reverses** 32:7  
**review** 90:22 93:6  
 100:11  
**reviewed** 171:1  
**reviewing** 93:21 143:20  
**revisited** 88:9  
**rhizome** 38:12  
**rhythm** 103:12 104:8  
**rhythms** 103:21  
**rice** 1:18 10:4,5 18:7  
 77:20 79:4 81:16  
 176:8  
**Richardson** 11:13,20  
 11:21 12:7,8  
**rid** 83:14  
**rigid** 84:12  
**risk** 18:13 79:9  
**risks** 166:22  
**river** 17:10 18:8  
**rivers** 18:1 22:19  
**Roberto** 50:10 53:18,19  
 53:20 63:2 66:16,18  
 66:21 67:3 69:8 70:13  
**Robin** 53:21 63:2 66:17  
 70:16,18 71:1 74:6  
**robust** 38:18 109:5  
**rock** 56:7,8,10 70:1  
 146:9  
**Roger** 131:16 138:13  
 147:18 158:5,7,9,11  
 165:19  
**role** 111:4 115:21  
**roll** 3:14 8:7  
**ROMERO-BRIONES**  
 1:19 10:8,10  
**room** 84:15 92:1 100:16  
**root** 24:18 38:3 54:12  
 55:12 61:5,7 68:1  
 111:19  
**root-zone** 38:6,17  
**rooted** 39:17  
**roots** 30:21 55:22 60:1

177:8,10  
**round** 157:22  
**route** 41:13  
**rule** 76:7 93:13 128:22  
 129:19  
**rulemaking** 15:2,3  
 129:19  
**rules** 65:19 118:8 155:2  
**run** 125:10 126:2  
**running** 161:15  
**rural** 132:16

---

**S**


---

**Sabara** 53:11,13,15  
 54:3 57:12 59:18 60:5  
 61:17  
**safe** 39:18 122:9 170:8  
 170:19,22 182:1  
**safety** 26:7,11,18 88:7  
 166:7  
**salient** 37:21  
**samples** 76:16 79:16  
**sanitation** 43:6,10  
**sanitizers** 43:8  
**Santa** 89:22  
**saw** 56:18 114:13  
**saying** 24:8 35:17  
 48:17 82:13,22 84:8,8  
 107:14 118:21 127:14  
 131:1,2 139:2 178:20  
**says** 62:7 117:15  
 163:21  
**Sbara** 54:3  
**Sbarra** 50:10  
**scale** 52:6 123:2 140:11  
 141:4  
**scenes** 5:5  
**schedule** 62:15,16  
 168:17  
**scheduled** 4:11  
**school** 72:7  
**science** 37:12 39:17  
 91:19 92:19 133:2  
 137:13,15,17 182:17  
**Sciences** 39:3 48:10  
**scientific** 15:16 37:21  
 61:2 62:6 91:3  
**scientifically** 55:10  
 56:4 57:22 62:5  
**scientist** 41:1,12,15  
 52:1 61:18 81:13  
 115:17  
**scientists** 112:1 166:9  
**Scott** 1:18 10:4,6 77:19  
**screen** 36:11,15 114:18  
**se** 157:9,20  
**sea** 71:10  
**seal** 30:10

**seamlessly** 183:8  
**search** 18:19  
**season** 126:17,21  
**seaweed** 71:9 72:20  
 73:5 95:10  
**seaweeds** 72:19  
**Seawright** 101:12 110:1  
 110:3,7,11,12,17  
 114:3,6  
**second** 4:9 5:14 6:8  
 12:2 23:6 43:11 46:8  
 53:17 62:21 74:16  
 101:11 107:6 110:5  
 126:12 128:17 131:19  
 136:1 147:18  
**Secondly** 139:19  
**Secretary** 1:14  
**section** 96:8 150:17  
**sector** 91:4  
**sectors** 162:17  
**sedimentary** 169:20  
**seed** 44:13 171:15  
**seeding** 72:11,15  
**seeing** 16:1 29:14 41:3  
 42:5 49:18 50:1 53:7  
 56:15 61:3 66:14  
 69:10 70:13 73:16  
 74:6 88:17 94:12  
 101:3 114:8 147:9  
 172:12,16 183:11  
**Seeley** 53:21 63:2  
 66:17 70:17,19 71:1,2  
 73:20 74:1  
**seen** 40:14,17 57:9  
 89:12 101:12 108:6  
 138:2 182:15,15  
**Seitz** 1:19 10:13,14  
**select** 140:20 170:12  
**sells** 158:17  
**send** 33:12 94:7 109:9  
 135:4 142:3 151:8  
 173:14 179:14  
**sending** 59:7  
**senior** 63:7 71:2 89:20  
 166:5  
**sense** 28:5 59:6 87:13  
 96:15 106:2,5 178:9  
**sent** 50:2 68:19 82:20  
 91:7 137:21  
**sentence** 7:18 100:1,4  
**separate** 19:21 20:9  
 24:10 58:7 140:2,5  
**separation** 171:20  
**serve** 169:15  
**service** 151:11  
**services** 72:15 101:17  
**servicing** 115:13  
**session** 5:14 31:22

- set** 70:7 114:20 117:22  
 135:5  
**setting** 104:10  
**settle** 25:7  
**seven** 112:7 143:12  
**sexual** 28:15  
**sexually** 28:2 166:18  
**Shannon** 2:4 50:9  
 53:11,12,16,18,22  
 54:3 59:19 62:12  
**share** 13:3 81:13 96:4  
 100:16  
**shared** 79:20 97:5  
**sharing** 109:6  
**shell** 22:10  
**shore** 72:15  
**short** 78:7 79:12 100:1  
 160:14  
**short-** 46:19  
**show** 133:2 145:1 146:1  
**showed** 40:1 91:10  
 112:18  
**showing** 40:14 61:13  
**shown** 72:4,7,9  
**shows** 72:10  
**shrunk** 96:20  
**shrinking** 97:15  
**shuts** 32:11  
**sick** 148:18  
**Sideman** 101:14 110:6  
 114:11,22 115:3,6,6  
 120:7 122:15 123:17  
 125:14 128:1,3,16,20  
 130:2,4 131:9,13  
 152:4 153:4  
**sides** 57:4,10 119:3,9  
**sign** 137:2  
**significantly** 150:5,7  
**silica** 170:2  
**similar** 24:10 39:4 45:8  
 99:9 113:16 145:14  
 155:8 181:17  
**similarly** 24:11 128:13  
**simple** 57:15 76:11  
 77:10  
**simply** 38:6 75:18  
 117:18  
**Simultaneous** 131:22  
**sing** 174:2  
**single** 76:19 146:20  
**sir** 50:13  
**site** 104:15 106:4  
**site-specific** 67:16  
 69:17  
**situation** 60:14 84:16  
 116:20 126:11  
**six** 112:6 150:10  
**size** 70:9 127:6
- Skaria** 46:9 50:5,7,13  
 50:14 53:10  
**skeletal** 169:21  
**skeptical** 182:16  
**skip** 6:18 9:10  
**slaughter** 43:19  
**sleight** 177:4  
**slide** 36:20 37:22 38:8  
 38:20 40:1 72:8  
 158:20 159:2,5,12,14  
 159:19 160:4,7,12,17  
 160:21 161:1,3,3  
 174:15 175:11,20,20  
 175:21 176:6,6,7,13  
 176:13,14  
**slides** 36:10,13,22 37:2  
 97:4 174:14  
**slightly** 86:2  
**slipped** 125:16  
**slot** 115:17  
**slow** 45:9,10  
**small** 81:1 123:2 140:13  
 141:4 149:17 176:18  
**Smithville** 12:10  
**Snyder** 48:8  
**soap** 139:16  
**society** 48:22  
**sodium** 95:20 106:14  
**soil** 13:15 21:20 30:19  
 31:9 33:8 35:19,22  
 37:22 38:4,6,12,16  
 39:3 40:2,4 41:3,11  
 41:19 52:12 54:10,17  
 54:22 55:6,16 56:3,10  
 56:11 59:1,5,6 60:1,2  
 61:12 62:2 67:21  
 79:16 111:8,18  
 113:10,14 116:3,22  
 117:3,9,11,12,15,16  
 118:9 119:19 120:16  
 121:15,20 122:3  
 126:19 129:8,10  
 130:14,17,18,22  
 131:1,7 136:9 137:16  
 139:8,17 142:11  
 152:1,2,3,13 153:17  
 154:9,14,19 155:8,9  
 155:11,22 156:4,11  
 157:21 158:16,18,19  
 158:21 159:4,7,11,16  
 160:14 161:11 164:14  
 175:1,6 177:4,11  
 178:5 179:19  
**soil-based** 47:2  
**soil-grown** 16:20 19:15  
 40:13,16  
**soilless** 38:4,13 41:19  
**soils** 40:10 67:18 152:9
- sold** 80:17  
**solid** 68:4,15 87:16  
 149:15  
**solid/liquid** 171:20  
**solids** 25:5,7 87:13  
**solubilized** 144:8,15  
 145:5,8 146:2,4  
**solubilizing** 144:12  
**soluble** 68:10,15  
 117:21 118:3,5  
 128:21 129:2,6,15  
 145:12,21 146:19  
 152:6  
**solution** 30:21 68:17  
 96:22 97:20  
**solutions** 30:19  
**solve** 98:20  
**somebody** 58:16 61:20  
 123:6  
**someone's** 6:17  
**something's** 116:9  
**somewhat** 122:4,11  
**soon** 115:11  
**sorry** 5:19 6:5 11:2 23:4  
 34:16 36:21 49:21  
 56:20 73:17 74:20  
 78:17 81:9 92:8 107:8  
 131:18 146:22 152:15  
 154:13 157:15 174:8  
 181:9  
**sort** 97:9 128:12  
**sound** 37:12  
**source** 21:8 178:22  
**sources** 99:12 162:2,4  
 178:19  
**South** 77:5  
**space** 72:12 132:21  
**speak** 60:7 108:3  
 110:15 170:3 177:22  
 179:22  
**speaker** 7:2 36:5 158:5  
 162:8,9 181:14  
**speakers** 6:22 85:11,16  
**speaking** 46:15 47:11  
 60:7 78:19 118:12  
 121:13 131:22 166:11  
**speaks** 39:8  
**special** 19:18 101:20  
**specialist** 2:3,5 50:17  
 89:21 115:8  
**specializing** 50:15  
**specialty** 75:17  
**species** 27:8,8 28:8,18  
 72:6,14 166:15  
**specific** 28:22 90:4  
 96:1 97:1 103:11,16  
 104:15 105:12 106:5  
 107:17 109:3 128:6
- 135:21 136:17 146:11  
 156:4 158:19,20  
 161:16 167:8  
**specifically** 15:8,13  
 26:14 47:9,11,14 48:2  
 48:7 60:8 96:8 129:13  
 137:4 139:8 144:13  
**specifics** 96:6 108:9  
**spectrum** 55:8 104:2  
 118:21  
**spectrums** 104:4  
**spend** 120:9  
**spent** 115:13  
**spinach** 39:12  
**spirit** 57:19 67:15 69:3  
**spoke** 80:7 181:14  
**spoken** 32:22  
**spray** 81:22  
**spraying** 79:15  
**spring** 95:22  
**square** 164:8 179:17,18  
**stage** 154:18  
**stages** 103:4,6 152:22  
**stakeholder** 92:21  
**stand** 21:15 32:20  
 119:19  
**standard** 43:17 60:15  
 100:12 116:8 141:21  
 163:2  
**standards** 1:3,9 2:2,4,5  
 2:5,6 4:5,8,20 5:4,9  
 12:13 13:1 14:7 19:17  
 31:10 37:7 38:22  
 39:15 52:13 56:5 62:1  
 64:7 66:3 68:21 71:16  
 72:22 73:2 96:5 99:8  
 108:7,20,22 109:1  
 116:12 120:12 124:1  
 154:5 159:11 172:8  
 174:22  
**stands** 33:12  
**Star** 6:12,13 85:9  
**start** 6:6 11:11 12:4  
 16:10 26:3 30:2 36:17  
 42:14 46:10 50:11  
 53:22 63:3 66:22  
 70:21 74:13 89:16  
 93:14 95:5 101:14  
 110:6,9 115:5 123:8  
 132:3,14 138:14  
 147:1,20 158:9 166:4  
 169:12 174:10  
**started** 115:19 127:13  
 130:13,13 180:19  
**starting** 70:2 139:6  
 157:17  
**state** 43:17 139:9  
 160:16 180:3

**stated** 14:8 15:1 20:17  
30:17 31:7 54:8 73:7  
**states** 1:1 47:14 48:2  
50:21 51:4,9,12 52:8  
52:17 87:10 88:3  
102:1 139:11 171:6  
**stating** 71:18  
**status** 112:21  
**steer** 156:14  
**step** 32:18,18 87:20  
**Steve** 1:17 9:16 20:14  
20:15 59:15 60:18  
137:11 153:15  
**stewardship** 58:22 59:4  
**stick** 59:15  
**sticking** 130:5,9  
**stifles** 160:22  
**stimulate** 96:10  
**Stock** 93:6  
**stop** 10:11 47:21  
168:13 182:19  
**storage** 78:3  
**stores** 134:2  
**straight** 56:9  
**straightforward** 153:12  
**strategic** 96:4  
**streams** 18:2 22:19  
**stress** 154:4  
**stringent** 84:7  
**strong** 39:17 105:21  
**stronger** 80:2 176:22  
**strongly** 19:1 54:5  
63:17  
**structure** 156:6  
**struggle** 48:15  
**students** 132:13  
**studied** 48:1  
**studies** 40:14 48:12  
113:2 138:5 142:3  
144:11,13 145:1  
181:10  
**study** 27:21 47:6,6  
52:14 111:20 142:10  
142:10  
**stuff** 139:1 143:7  
**sub-optimal** 111:14,17  
**subcommittee** 1:14  
26:13 31:19 37:9  
63:14,16,18 67:7  
68:20 100:2 104:19  
116:17 117:17 120:10  
120:20 127:18 130:19  
136:6 143:19 148:2  
151:8,18 170:4 172:5  
**Subcommittee's** 172:9  
**subject** 61:21 69:5 86:5  
129:5  
**submit** 138:5

**submitted** 18:18 26:9  
26:10 33:5 95:18  
137:17,19  
**substances** 170:6,13  
172:7  
**substrate** 25:11 67:4  
69:13,16 145:19  
**successful** 6:8 141:2  
159:16  
**sucking** 17:9  
**Sue** 1:15 8:9 83:2,3  
109:16  
**sufficient** 87:21  
**sufficiently** 15:9 79:3  
**sugar** 162:3,3  
**suggest** 18:12 90:21  
**suggested** 119:14  
170:14  
**suggesting** 13:9  
**suggestion** 93:3 161:1  
**suggestions** 57:6 92:16  
93:2  
**suitable** 111:6,11,12  
**sum** 66:1  
**super** 105:20  
**supplied** 102:13  
**supplies** 52:8  
**supply** 12:12 50:22  
165:15 181:9  
**support** 18:21 47:4  
52:15 57:6 66:2 72:5  
83:6 100:1 102:8  
103:19 104:20 105:1  
113:10 116:16 120:3  
170:3 183:6  
**supported** 111:20  
**supporting** 13:8 117:18  
127:17 134:14  
**supports** 26:18 33:7  
172:4  
**supposed** 125:20  
**surface** 155:12  
**surprisingly** 116:5  
**surrounding** 71:21  
124:9  
**survives** 148:20  
**surviving** 142:12  
**Susan** 109:19  
**suspension** 146:20  
**sustainable** 12:22 17:8  
19:9 49:8 64:12 71:4  
105:19 132:7  
**sustained** 67:14  
**Swafar** 10:16  
**SWAFFAR** 1:13 10:17  
94:5,10 135:11,18  
142:18 143:2,16  
**sweeteners** 171:16

**switch** 45:10  
**synthetic** 22:8 63:11  
133:5,12  
**system** 13:14 16:22  
21:10,11,15 22:6,10  
22:14,17 23:8,9,11,18  
24:3,19,20,22 25:1,3  
25:15 38:9,15 41:7  
54:11,12 59:3,9 61:4  
61:9 62:11 95:17 97:7  
99:15,15 100:17  
109:2 111:2,7 135:14  
136:19,22 143:4  
144:9,15,20 146:3,11  
147:3,6 148:22  
149:21 152:1,3,5,12  
152:13,14 153:17  
154:3,9,9,15,19  
155:15  
**systems** 15:9 23:2,19  
24:1 31:8,17 32:22  
33:9,22 34:2,6,6 55:9  
55:11,18 62:8 67:21  
72:3 80:1 104:21  
105:20 106:16,18  
113:4,5,13 122:17,21  
132:21 133:16 137:17  
139:20 141:4,18,18  
142:2 145:3

---

**T**


---

**table** 39:8  
**tables** 153:3  
**taken** 49:6 159:13  
**takes** 141:12  
**Talbert** 74:9 85:1 88:20  
88:21 173:20  
**talk** 27:17,19 61:20  
80:20 119:21 140:2  
**talked** 119:2 128:7  
137:13 153:3 162:14  
**talking** 5:16 8:15,22  
26:8 76:15 77:6 94:21  
120:4,9 129:4 136:8  
140:20 156:3 172:20  
178:17  
**Tambay** 131:16 138:14  
147:19 158:5,8,11,11  
162:1,19 163:10,16  
163:20 164:1,9,20  
165:12,15,17  
**tank** 25:2  
**task** 14:22 124:19  
**tasked** 15:13  
**TBD** 27:14 64:15  
**tea** 143:7  
**teach** 132:9  
**technical** 26:7 174:6

**technically** 159:18  
**technique** 12:21 39:5  
166:13 167:13  
**techniques** 27:9 28:7  
32:17 63:19 64:3,11  
64:13,15 65:1,4 66:8  
166:11 168:10  
**technologies** 24:10  
**technology** 32:19 63:8  
85:22 166:6 181:20  
**teeming** 37:22 38:12  
**teleconference** 5:6  
**tell** 40:21 69:12 73:21  
80:4 84:6 134:22  
136:17 144:10 145:17  
174:1  
**telling** 138:22  
**tempted** 99:9  
**ten** 39:6,15 75:9 112:14  
140:8 149:16 158:4  
160:9 175:4  
**tend** 119:10  
**tends** 74:2  
**term** 156:19 168:11  
**terminator** 28:4  
**terminology** 27:6,15  
63:22 65:15 168:12  
**terms** 31:13 37:18  
98:12 164:17,21  
**terrestrial** 30:20 71:21  
**terrestrially** 113:7  
**Terry** 105:6 118:15  
**test** 79:7 80:10,14,21  
81:3,3,4,4,5 163:12  
**tested** 56:2 76:12,14  
79:13 83:8 181:22  
**testimony** 74:7  
**testing** 77:14,21 78:5  
79:11 80:13 81:10  
82:7 83:18,18 116:3  
158:15 160:11,19,22  
161:10 182:8  
**tests** 75:22 76:5 144:11  
146:1 162:19  
**Texas** 12:10 50:17  
51:20  
**text** 129:19  
**textbooks** 126:3  
**thanks** 5:21 8:8,17 11:7  
37:3 74:19 78:21 79:1  
94:5 100:22 124:19  
151:16 165:6,16  
169:2,14 183:14  
**they'd** 129:8  
**thiamine** 43:12 44:12  
44:15 45:5,7,12 90:14  
**Thicke** 1:14 10:19,20  
39:22 40:12,22 41:22

59:19 60:17 69:12  
70:11 105:8,14 106:6  
124:13,16,18 127:9  
145:17 146:17 147:7  
151:16 153:2  
**thickness** 160:9,18  
164:11,12  
**thicknesses** 164:5  
**things** 58:13 59:10  
83:11 91:14 99:9  
118:18 120:4 129:8  
136:10 139:3,4 145:9  
153:4 154:6 156:7  
**thinks** 123:7  
**thinner** 176:2  
**third** 51:11  
**Thorvin** 95:9  
**thought** 33:19 100:15  
156:13 174:6  
**thoughtful** 183:2  
**thousands** 17:5 18:7  
32:12 33:20 34:1,7  
160:11  
**three** 7:12,13,15 26:22  
27:4 51:13 52:1 64:20  
65:1 86:3 95:19 96:3  
96:6,16 102:3 140:5  
143:14 147:3 166:11  
171:5  
**thrilled** 100:6  
**thrive** 38:4  
**THURSDAY** 1:7  
**ties** 143:20  
**tighten** 76:12  
**timeframe** 78:1 181:11  
**timeliness** 91:2  
**times** 39:6,12,15 61:6  
140:5 149:22 153:21  
**timing** 107:13  
**tissues** 167:6  
**title** 92:2  
**today** 5:1,10 9:19 13:3  
30:6 35:13 43:1 46:20  
74:7 90:3 108:11  
113:21 116:16 139:1  
170:3 181:1  
**today's** 4:7,19 5:5  
37:14  
**Todd** 100:21  
**tolerance** 76:21  
**Tom** 1:10,13 3:12,20  
5:7,9,15,18 8:8 9:11  
11:8,18 36:21 50:2  
56:18 74:15 78:21  
89:2 94:20 174:1  
183:14  
**tomato** 126:17 140:21  
**tomatoes** 126:22

175:12,19  
**ton** 153:8  
**tons** 154:3  
**tool** 100:21 128:14  
142:22 158:22 175:19  
**toolbox** 96:19  
**tools** 107:14 175:9  
176:18  
**top** 6:6 148:22 149:21  
150:2,21  
**topic** 43:1  
**topics** 95:19  
**total** 87:18 148:11  
176:12  
**totally** 23:10 119:1,2  
**touch** 60:1 153:1  
**toxic** 67:22 125:9  
**track** 90:18 106:11  
**tracking** 63:12 80:2  
**traction** 98:19  
**tractors** 17:12  
**tracts** 77:7  
**trade** 169:18  
**traditional** 47:4 48:19  
48:21 49:4  
**train** 106:17  
**trait** 119:11  
**transcripts** 8:3,4 20:3  
**transfer** 54:16  
**transformation** 14:14  
**transformed** 20:21  
177:11  
**transforming** 98:3  
**transgenesis** 28:10  
**transitioning** 132:10  
**Transitions** 90:12  
**transplant** 147:2  
**transposition** 168:1  
**transposons** 27:14  
63:21 64:20 65:6,12  
167:16 168:5,8,12  
**traveled** 75:9  
**treatment** 12:19  
**tremendous** 120:8  
**trials** 47:21  
**tried** 77:4 86:1 176:19  
**triggers** 76:2  
**trimmings** 25:10  
**trophic** 37:19 38:19  
41:21  
**trucks** 17:4  
**true** 69:2 142:13  
**truly** 83:6,6 97:18 134:7  
**trust** 19:16 37:7  
**try** 7:3,17 41:18 57:20  
59:15 77:2 85:15  
114:17 123:9,10  
124:2,4 130:7 161:15

**trying** 64:4 93:18 131:5  
155:18 156:14  
**Tuesday** 47:12 55:5  
125:5 183:11  
**tune** 174:2  
**turkeys** 21:21  
**turn** 5:7 85:16 134:19  
141:2  
**Twenty-six** 67:5  
**twice** 46:4 80:15 89:4  
94:17 101:7 172:15  
**two** 6:22 23:5 24:9  
25:14 51:7,19 52:2  
59:14 87:15 96:11  
100:1 108:2 116:12  
127:11 128:16 129:12  
143:8,13 145:8  
161:16 162:17,17,19  
176:10  
**type** 104:10 140:12  
141:3 146:6,8 156:4,5  
158:19 160:14 164:14  
**types** 102:16 128:15  
139:19 143:14  
**typically** 79:14

---

**U**

---

**U.S** 63:9 170:9 171:6  
175:4  
**ultimately** 54:12 163:9  
**umbrella** 14:18 15:17  
**un-mute** 85:15  
**unallowed** 97:10  
**unanimously** 64:6  
**unavailable** 98:13  
**understand** 41:2 47:7  
48:15 55:12 58:19  
82:13,22 100:19  
127:22 133:21 152:11  
179:18  
**understanding** 20:6,8  
60:22 76:2 79:10 91:6  
**understood** 49:5  
**undertake** 15:2  
**underwater** 72:10  
**undoubtedly** 13:3 18:6  
**unfair** 52:7 102:22  
**unfounded** 13:5  
**unifarming** 117:4  
**unintended** 96:13  
**Union** 31:11 88:3  
**unit** 141:16  
**United** 1:1 50:21 51:4,9  
51:12 52:8,17 102:1  
171:6  
**university** 36:19 48:9  
50:18 71:3 126:5  
153:10

**unmute** 6:13 131:19  
173:2  
**unmuted** 8:16 73:18  
**unnecessary** 110:21  
**unobtainable** 132:17  
**unreasonable** 13:5  
**unrelated** 110:21  
**unsafe** 37:15  
**unscrupulous** 80:18  
**unviable** 68:7  
**upcoming** 4:10  
**update** 64:6  
**updates** 4:13 66:2  
150:1  
**updating** 66:7  
**uphold** 104:13  
**upstate** 67:4  
**upstream** 77:12  
**uptake** 54:21 60:16  
149:5 157:7,18  
**urban** 133:1  
**urge** 33:11 43:2 63:17  
68:18 151:7  
**urges** 172:7  
**usable** 182:11  
**USDA** 5:2 30:9,13 32:3  
32:8 33:7 35:12 39:10  
39:16 48:14 49:11  
82:7 90:1,10 91:8  
92:6 93:19 109:1  
116:1 124:19 130:6  
**use** 6:13 13:13 14:2,9  
17:11 18:9 20:18  
23:17,18 25:9,11,11  
27:13 28:15 35:10  
40:11 55:3 65:12,17  
65:20 69:13,17 86:7  
88:13 99:12 103:10  
109:1 124:5 125:19  
126:3 128:13 131:6  
132:20 133:5,13  
134:20 136:5 141:7  
141:10 142:1 143:13  
143:14 145:19 146:6  
146:6,9,12 154:1  
155:15 160:5 161:5  
168:12 170:9,19  
**useful** 90:10 96:17  
100:21  
**uses** 16:18 28:7  
**ushering** 48:12  
**usually** 85:11 126:21  
146:1 149:14  
**usurp** 123:10  
**utility** 142:22  
**utilize** 86:19 146:12  
**utilizes** 12:10  
**utilizing** 103:5

**V**

**vaccines** 65:8,18  
**valid** 41:17  
**Valley** 17:4  
**valuable** 123:4  
**valve** 25:8  
**variance** 31:14  
**variate** 69:20  
**varieties** 28:14,21  
 112:7 166:18  
**variety** 104:15 111:3  
 112:2 146:12  
**various** 103:17 106:15  
 146:9 152:6,22  
 153:20 166:17  
**vary** 180:1  
**vast** 47:20 140:9,12  
 141:20  
**vector** 168:5  
**vectors** 167:7 168:3  
**vegetable** 28:14 126:4  
 126:16,16  
**vegetables** 47:20,22  
**vegetative** 73:9  
**vehicle** 86:18  
**verifiable** 56:5  
**verification** 100:9  
**verified** 57:22  
**verify** 103:4 162:12  
 165:10  
**vermiculite** 146:10  
**version** 89:5 98:22  
**versus** 38:22 39:7,11  
 40:5,13,15,18 41:19  
 154:11 155:5 160:15  
 160:16 164:18 176:5  
 178:20 179:6  
**viable** 51:4 68:11 150:9  
**Vice** 1:13  
**view** 33:1 82:19 158:13  
**viewing** 23:13  
**virtues** 33:2  
**visualize** 177:9  
**Visualizing** 97:8  
**vitality** 40:20  
**vitro** 167:10,13  
**volcanic** 146:9  
**volume** 87:18  
**volunteer** 97:22  
**vote** 19:3 20:7 31:22  
 67:7 68:18 97:20  
 137:7 151:7 176:15  
**voted** 64:6 67:10  
**voting** 19:21 143:20  
**VP** 85:20

**W**

**wage** 68:7

**Wagner** 16:9 25:22  
 29:19,22 30:4,5 34:1  
 34:4,11 35:3  
**wait** 173:16,21 174:2  
**walks** 97:8  
**wanted** 42:22 43:11,15  
 55:7 57:1 86:6 90:5  
 92:15 94:6 118:18  
 128:13 129:11 152:16  
 165:9 181:11  
**wants** 120:8  
**warm** 126:19  
**wars** 99:4  
**Washington** 160:16  
 166:8  
**wasn't** 107:9 120:18  
 130:12 139:9  
**waste** 14:4,14 17:20,21  
 21:18 44:21 68:5  
 82:14 86:11 148:18  
**wasteful** 148:13 149:6  
**watching** 136:19  
**water** 12:19 16:19 18:5  
 18:5,8 22:2,3,15,22  
 24:5,16 25:4,15 30:19  
 33:8 38:1,4 54:17,20  
 55:2 56:8 59:3,21  
 60:3,11,13 61:4 69:19  
 140:18 141:8,19  
 176:9 177:14  
**watershed** 59:8,9  
**wavelengths** 104:11  
**way** 22:1,20 23:12,13  
 23:20 24:12 25:1  
 33:13 34:22 52:18  
 57:15 58:21 60:10,15  
 68:16 77:14 81:6 84:3  
 85:15 110:21 116:19  
 117:5,6 127:15 130:8  
 136:7 155:8 157:1  
**ways** 48:12 52:15 91:18  
 92:18 97:19 107:16  
**web** 89:5  
**webinar** 1:5,10 4:8,9,19  
 5:10,13 6:8 13:7 31:5  
 71:7  
**website** 4:15  
**weed** 158:22  
**week** 4:9,18 183:12  
**weekend** 183:12  
**weeks** 81:10 147:3  
**weight** 48:5 165:11  
 176:1  
**weights** 164:3  
**welcome** 3:8 4:6 5:12  
 6:7 98:4 131:9 165:17  
**Well-Being** 42:17  
**went** 86:2 183:16

**wetland** 22:19  
**wetlands** 18:2  
**Whoa** 100:4  
**wide** 111:3 146:12  
**widely** 75:20 76:9  
**wield** 48:21  
**Wil** 25:22 29:19 36:6,16  
 36:19 37:4 39:20,21  
 39:22 42:6  
**wild** 17:17 71:10,15  
 72:20,22 73:1,5  
**Wilson** 112:1  
**wine** 171:22  
**winery** 171:13  
**Wisconsin-Madison**  
 48:9  
**wish** 132:11  
**Wolf** 89:13 94:18,22  
 95:7,7,7,11 98:14  
 100:4  
**wonder** 83:8 177:6  
**wondering** 34:18  
 106:22 122:10 144:2  
**word** 18:19 117:15  
**words** 54:14 179:6  
**work** 34:5 58:16 61:1  
 70:6 73:11 90:14 91:3  
 91:16 92:17 93:7,10  
 104:18 115:7 125:9  
 125:18 152:1,3 154:3  
**workable** 152:12  
**worked** 106:16,18  
 110:18 115:9 123:3  
 150:18  
**working** 17:13 34:2  
 41:16 63:14 71:10  
 73:3 115:19 119:22  
 124:16  
**works** 146:15  
**world** 19:6 50:21 75:10  
 75:21 76:10  
**worm** 18:9  
**worms** 18:9  
**worries** 74:21  
**worry** 28:11  
**worst** 135:1  
**wouldn't** 134:10,11  
 163:8  
**writing** 120:12  
**written** 33:4 37:16  
 95:18  
**wrote** 116:7 124:2

**X****Y**

**YANESSA** 2:4  
**year** 37:11 64:5 65:10

68:6 70:5 76:17 93:5  
 143:15 149:2 150:13  
 150:22 154:18 156:2  
 156:5 157:22 176:11  
 180:20  
**year's** 148:11  
**year-round** 12:11 48:18  
**years** 30:11 49:8 50:17  
 51:16 54:4 63:12  
 71:11 75:9 91:15  
 95:15 110:18 115:9  
 139:21 140:7,8  
 150:11,14 174:20  
 175:4,4 176:10 180:6  
 182:14  
**yeast** 99:4,5 171:21  
**yellow** 112:16  
**Yemi** 36:7 42:10 45:22  
 46:1,3 173:19  
**yesterday** 35:17  
**yield** 48:18 153:9  
**yields** 175:18  
**young** 148:14 149:10  
 149:18  
**Yuma** 17:4

**Z**

**zero** 76:21,22 84:9  
 147:1,1 159:9  
**zone** 38:3 55:13 68:1  
 155:12  
**zones** 54:12 77:5

**0****1**

**1:00** 1:10  
**1:04** 4:2  
**10,000** 160:1  
**100** 38:13 39:6 72:6  
 76:14,17 82:1 84:9  
 105:10,16 162:13  
 181:15,21 182:6  
**100-person** 52:4  
**11** 3:17  
**11th** 26:11  
**12** 87:11,19  
**120-day** 87:7  
**126** 34:4  
**14** 11:10  
**14th** 31:6  
**15** 11:10 68:9 174:20  
 175:4  
**15-1** 158:15 159:21  
**165** 87:11  
**167** 18:20  
**17** 71:10 88:5  
**182** 3:20

183 3:22  
 1963 170:8  
 1979 170:11  
 198 18:17  
 1983 170:17  
 1986 115:19  
 1990 38:8 91:21  
 1992 95:13  
 1995 30:6  
 1997 115:16

---

**2**

2 37:22 158:14 159:21  
 160:1  
 2,000 101:22  
 20 102:11 106:15 125:2  
 125:16,21 128:6  
 140:7 148:21 180:19  
 200 148:8  
 2002 88:4 115:16  
 170:20  
 2005 51:10 171:2  
 2009 47:14  
 2010 140:3,4 171:2  
 2013 29:2  
 2014 30:16  
 2015 171:2  
 2016 15:1 64:5 71:13  
 2017 1:7 39:10 134:12  
 2021 68:9  
 205.207 71:15 73:1  
 205.237 43:17  
 22-year 32:7  
 25 95:15 110:18 175:18  
 25-year 12:16  
 25,000 160:3  
 26 1:7  
 29th 37:11  
 2nd 4:12

---

**3**

3 38:8 158:14  
 30 17:7 50:17 115:9  
 149:1 180:20  
 31st 4:11  
 349 102:2  
 35,000 160:19

---

**4**

4 3:9 38:20  
 4:07 183:16  
 40 180:3,20,22

---

**5**

5 3:12  
 50 102:13 113:21 125:7  
 148:10 155:10 156:1  
 156:8 181:2

5006 87:8

---

**6**

6 6:12 85:9  
 60 39:12 88:5 159:13  
 600 134:15  
 601 99:10  
 603 99:10  
 605 96:9 98:11,16,17  
 606 96:9  
 64 51:16

---

**7**

7 6:13  
 70 67:3,5

---

**8**

8 3:15  
 80 150:21  
 80s 123:3  
 84 18:22 19:3  
 86-year 51:15

---

**9**

90 16:19 17:2 87:7  
 162:14 163:2,13  
 95 87:18

C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Public Comment Webinar

Before: USDA/NOSB

Date: 10-26-17

Place: webinar

was duly recorded and accurately transcribed under my direction; further, that said transcript is a true and accurate record of the proceedings.

  
-----  
Court Reporter

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

## UNITED STATES DEPARTMENT OF AGRICULTURE

+ + + + +

## NATIONAL ORGANIC STANDARDS BOARD

+ + + + +

## FALL 2017 MEETING

+ + + + +

TUESDAY,  
OCTOBER 31, 2017

The Board met in Florida Ballrooms A, B & C of the Omni Jacksonville Hotel, 245 Water Street, Jacksonville, Florida at 8:30 a.m., Tom Chapman, Chairman, presiding.

## PRESENT

TOM CHAPMAN, Chair  
ASHLEY SWAFFAR, Vice Chair  
JESSE BUIE, Secretary  
SUE BAIRD  
HARRIET BEHAR  
ASA BRADMAN  
A-DAE BRIONES  
LISA DE LIMA  
STEVE ELA  
DAVE MORTENSEN  
JOELLE MOSSO  
EMILY OAKLEY  
SCOTT RICE  
DAN SEITZ  
FRANCIS THICKE

## STAFF PRESENT

MICHELLE ARSENAULT, NOSB Advisory Board  
Specialist, National Organic Program  
DR. LISA BRINES, Ph.D., National List Manager,  
National Organic Program  
DR. PAUL LEWIS, Ph.D., Director, Standards  
Division, National Organic Program  
DEVON PATTILLO, Materials Specialist, National  
Organic Program  
DR. JENNIFER TUCKER, Ph.D., Associate Deputy  
Administrator, National Organic Program;  
Designated Federal Official

## ALSO PRESENT

TOM BARRETT, Allen Farms  
JO ANN BAUMGARTNER, Wild Farm Alliance  
AN AIS BEDDARD, Lady Moon Farms  
TOM BEDDARD, Lady Moon Farms  
JENNIFER BERKEBILE, Pennsylvania Certified  
Organics  
MICHAEL BESANCON, Patagonia  
MARIAN BLOM, IFOAM EU  
MICHAEL BROWNBAC, Spiral Path Farm  
DAVE CHAPMAN, Long Wind Farm  
DANIEL COLLIER, International Trade Specialist,  
U.S. Customs and Border Protection  
MICHAEL COLLINS, Old Athens Farm  
JIM CRAWFORD, New Morning Farm; The Cornucopia  
Institute  
THEOJARY CRISANTES, Wholesum Harvest  
GERALD DAVIS, Grimmway Farms  
LINLEY DIXON, The Cornucopia Institute  
MICHAEL DURANDO, Director, Marketing Order and  
Agreement Division, Specialty Crops Program,  
Agricultural Marketing Service  
MATTHEW FARMER, APHIS/Plant Protection and  
Quarantine  
JIM FULLMER, Demeter Association  
JIM GERRITSEN, Wood Prairie Farm  
KARL HAMMER, Vermont Compost Company  
PAUL HARLOW, Harlow Farm

## ALSO PRESENT

PETER JOHNSON, Pete's Greens  
IAN JUSTUS, Driscoll's  
MARK KASTEL, The Cornucopia Institute  
MADISON KEMPNER, NOFA-VT  
FRED KIRSCHENMANN, Iowa State  
ALAN LEWIS, Natural Grocers  
ESTEBAN MACIAS, Grupo U  
JESSE MARANVILLE, Georgia Gulf Sulfur  
MELODY MEYER, UNFI  
JOHANNA MIRENDA, OMRI  
DAVEY MISKELL, Miskell's Premium Organics  
JEFF MOYER, Rodale Institute  
EMILY MUSGRAVE, Driscoll's  
ROGER NOONAN, Middle Branch Farm; New England  
Farmers Union  
HOWARD PRUSSACK, High Meadow Farms  
URVASHI RANGAN, U R Consulting  
JIM RIDDLE, Blue Fruit Farm  
KYLA SMITH, Pennsylvania Certified Organics  
MARY-SCOTT STANDISH, Fresh2o Growers  
LISA STOKKE, next7.org  
RUSSELL TAYLOR, Humic Products Trade Association  
ANGELA TENBROECK, THF Hubery; CSAEC  
CHARLOTTE VALLAEYS, Consumer Reports

C O N T E N T S

Call to Order. . . . . 5

Agenda Overview. . . . . 7

Introductions. . . . . 8

Secretary's Report . . . . .12

USDA National Organic Program Report . . . . .12

Office of Inspector General Report . . . . .37

ANSI Peer Review Update. . . . .52

NOSB Report. . . . .59

Panel - Imports. . . . . 103

National Organic Program - Materials Update/  
 Summary of new and outstanding petitions . . . . 206

Public Comments. . . . . 224

Adjourn. . . . . 501

1 P-R-O-C-E-E-D-I-N-G-S

2 8:35 a.m.

3 DR. TUCKER: Okay. Good morning  
4 everyone. We're going to get started here.

5 Welcome. We are officially opening  
6 the fall 2017 National Organic Standards Board  
7 Meeting.

8 My name is Jennifer Tucker. And I'm  
9 the Associate Deputy Administrator of the  
10 National Organic -- the National Organic Program,  
11 part of the Agricultural Marketing Service.

12 First I want to thank everyone for  
13 being here. Thank you for making your way to  
14 Jacksonville. And Happy Halloween.

15 I'm going to be serving as the  
16 Designated Federal Official or DFO for this  
17 meeting. At previous meetings that role had been  
18 filled by Miles McEvoy, who left the National  
19 Organic Program at the end of September.

20 I worked side by side with Miles for  
21 six years. So, sitting in this seat today is a  
22 true honor and very, very meaningful for me.

1                   He's not here with us today. But I'd  
2 like to recognize his service. Can we give him a  
3 round of applause?

4                   (Applause.)

5                   DR. TUCKER: Thank you. Next, I'd  
6 like to give a special thank you to Tom Chapman  
7 to my right here. Tom is the Chair of the Board  
8 and this meeting.

9                   That role takes tremendous focus and  
10 organization. We're really, really grateful for  
11 his work. So can we give him a round of applause  
12 in advance for a great meeting?

13                   (Applause.)

14                   DR. TUCKER: And finally, I'd like to  
15 recognize and thank Francis Thicke. Francis is  
16 completing his fifth year with the Board So this  
17 is his last in person meeting as a Board member.

18                   So -- yes.

19                   (Applause.)

20                   DR. TUCKER: Francis has invested  
21 many, many hours. And has brought extensive  
22 insights and experience to this group over the

1 last five years.

2 We're incredibly grateful for his  
3 service. We'll be formally recognizing him on  
4 Thursday. But I wanted to mention him right up  
5 front.

6 So again, Francis, thank you.

7 (Applause.)

8 DR. TUCKER: I'm going to introduce  
9 the rest of the NOP team during the NOP update.  
10 But right now I'm going to hand things over to  
11 Tom.

12 MR. CHAPMAN: Thank you Jenny. Hello  
13 and welcome everyone. Thank you for traveling  
14 here today to participate and observe the NOSB  
15 meeting.

16 I hope everyone traveled safe. And is  
17 enjoying Florida's hospitality.

18 I'm going to briefly review the  
19 agenda. And then we'll do brief introductions of  
20 the Board Members.

21 So this morning we're going to take  
22 care of some formalities and introductions. And

1 then later we'll hear reports, the NOP Report and  
2 ANSI Peer Review Audit from Jenny, the Associate  
3 Deputy Administrator.

4 After a brief update from the Chair,  
5 we will then move onto a panel of experts on  
6 imports with representatives from several federal  
7 agencies.

8 In the afternoon we will be getting an  
9 update on the National List and Petition status.  
10 And then get into public comment for the rest of  
11 the day.

12 Tomorrow we'll continue with public  
13 comment in the morning. And then move onto crops  
14 and the CACS Subcommittee after that.

15 On Thursday we have livestock handling  
16 in the Materials Subcommittee. And then we'll  
17 finish with any deferred items, review of the  
18 current work agenda, recognition of outgoing  
19 member, if we let him leave, and an election of  
20 officers.

21 With that we'll move onto  
22 introductions. Jenny, as she said, will

1 introduce NOP Members later during her  
2 presentation.

3 So let's start with NOP Members today.  
4 If we could start with you?

5 MS. BRIONES: A-dae Briones.

6 MR. CHAPMAN: And maybe the seat you  
7 sit in.

8 MS. BRIONES: Oh, Public Interest.  
9 And I've been here for two years.

10 MS. DE LIMA: Good morning. Lisa de  
11 Lima. MOM's Organic Market. I'm in the  
12 Retailers seat. This is my third year.

13 MR. BRADMAN: Asa Bradman with UC  
14 Berkeley. And I'm also on the Board of Trustees  
15 of the Organic Center. And I'm in the  
16 Environmental and Conservation seat.

17 MS. MOSSO: Joelle Mosso. I'm with  
18 Olam Spice and Vegetable Ingredients out of  
19 Fresno. And I am in my first year along with  
20 Asa. And I'm in the Processor/Handler seat.

21 MR. ELA: Steve Ela. Ela Family Farms  
22 in Hotchkiss, Colorado. I sit in the -- one of

1 the Growers seats. And this is my first year.

2 MR. MORTENSEN: Dave Mortensen. A  
3 faculty member in Agro-Ecology at Penn State in  
4 State College, Pennsylvania. Finishing my first  
5 year on the Board.

6 MR. BUIE: Jesse Buie. Ole Brook  
7 Organics, Brookhaven, Mississippi. I sit in the  
8 Organic Producers seat.

9 And I've been on the Board a year and  
10 a half. And I'm the Secretary of the Board.

11 MS. SWAFFAR: Hi. I'm Ashley Swaffar.  
12 I'm from Fayetteville, Arkansas. I sit in the  
13 Producers seat. I have a small certified organic  
14 mixed vegetable farm.

15 I also do animal welfare and organic  
16 inspections. I'm the Chair of the Livestock  
17 Committee and Vice Chair of the Board.

18 MR. CHAPMAN: Tom Chapman. I work for  
19 Clif Bar & Company. This is my third year on the  
20 Board. And I currently chair it.

21 DR. SEITZ: Dan Seitz. This is my  
22 second year on the Board. I fill a

1 Consumer/Public Interest seat. And I'm also the  
2 Executive Director for the Council on  
3 Naturopathic Medical Education.

4 MR. RICE: Scott Rice with the WSDA,  
5 or Washington State Department of Ag, Organic  
6 Program. I sit in the Certifier seat. And this  
7 is my second year.

8 MS. BAIRD: Sue Baird. I am from  
9 Missouri. And I represent Public  
10 Interest/Special Interest groups. I am on the  
11 Crops Committee and currently Vice President --  
12 Vice Chair of the Livestock Committee.

13 MS. BEHAR: I'm Harriet Behar. I'm  
14 from Wisconsin. I'm a certified organic grower.  
15 I'm the Chair of the Materials Committee. And  
16 this is my second year.

17 MS. OAKLEY: I'm Emily Oakley. And I  
18 have Three Springs Farm in Northeastern Oklahoma.  
19 It's a full time job for me. And it's a two-  
20 person operation. And I sit in one of the  
21 Farmers seats.

22 DR. THICKE: Francis Thicke. Organic

1 dairy and crop farmer from Iowa. I sit in the  
2 Environmentalist seat and then chair the Crops  
3 Subcommittee.

4 MR. CHAPMAN: Thank you. Up next we  
5 have the Secretary's Report. Secretary Jesse  
6 Buie, can you report?

7 MR. BUIE: Mr. Chair, the minutes of  
8 the April 2017 Biannual Public Meeting has been  
9 distributed behind the reference tab in the  
10 binder. Are there any corrections or comments?

11 (No audible response.)

12 MR. BUIE: Mr. Chair?

13 MR. CHAPMAN: Seeing none, without  
14 objection we'll approve the report by consensus.

15 (No audible response.)

16 MR. CHAPMAN: Seeing no objection, the  
17 report is approved. We'll now move back to  
18 Jennie for the NOP Report and the Peer Review  
19 update.

20 Jennie, you have three minutes.

21 (Laughter.)

22 DR. TUCKER: I want to start my timer

1 just so I leave enough time for questions here.

2 So, okay.

3 Okay. So good morning everyone. I am  
4 very pleased to be here today. Again, my name is  
5 Jennie Tucker. I am the Associate Deputy  
6 Administrator of the National Organic Program.

7 I have been there for six years. I  
8 love what I do. I am committed to the success of  
9 the organic community. And I am pleased to share  
10 this update on behalf of the Agricultural  
11 Marketing Service.

12 So here's an overview of what I am  
13 going to talk about today. First we're going to  
14 do some welcomes and thanks.

15 I'm going to give you a transition  
16 update. I'm going to talk a bit about the Sunset  
17 2017 Final Rule. Then we're going to turn to  
18 enforcement and imports.

19 And an integrity update, so organic  
20 integrity database update. I'm going to give you  
21 an overview of the -- of the Office of Inspector  
22 General's Report that came out in the last couple

1 of months here.

2 And then we'll do a peer review of  
3 NOP. So, an update on what ANSI found during  
4 their 2017 Peer Review.

5 And then we will close. And I want to  
6 leave time for questions from the Board.

7 So first, I just want to welcome  
8 everyone to Jacksonville. And I want to thank  
9 the 15 members of the NOSB who sit up here today.

10 These volunteers devote enormous  
11 amounts of time to represent the interests of the  
12 organic community. They've read your comments.  
13 They're going to listen to you this week. And  
14 they will continue to serve you in the months  
15 ahead.

16 All of us thank you for your  
17 dedication. Can we give them a round of  
18 applause, please?

19 (Applause.)

20 DR. TUCKER: I also want to thank the  
21 hundreds of people who are participating in some  
22 way during this meeting. So I want to take a

1 look at that engagement.

2 We got more than two thousand written  
3 public comments before this meeting. So that's a  
4 lot of folks who took the time to submit a  
5 written comment online. So we thank them all.

6 Fifty-two people provided oral  
7 comments on two separate webinars. There were a  
8 total of 165 webinar attendees. And then we have  
9 93 people signed up to speak in Jacksonville.

10 So, a truly committed community  
11 helping to move very, very important work  
12 forward. So thank you all.

13 I also want to extend a welcome and  
14 thanks from USDA leadership. And so we have a  
15 Secretary, Sonny Perdue.

16 We have a Deputy Secretary, Steve  
17 Censky. We have Former Acting Undersecretary of  
18 Marketing and Regulatory Programs. His name is  
19 Kevin Shea.

20 And I list him because Kevin literally  
21 stopped being Acting yesterday when the new  
22 Undersecretary, Greg Ibach, was sworn in in

1 Omaha.

2 So, again today, starting this  
3 morning, we have an Undersecretary of Marketing  
4 and Regulatory Programs, Greg Ibach. Which  
5 again, just sworn in yesterday.

6 And then we have Acting AMS  
7 Administrator Bruce Summers. Okay.

8 And so for those who are less familiar  
9 with the organizational structure, I'll quickly  
10 mention how all of these fit together. The NOP  
11 is part of a larger agency called the  
12 Agricultural Marketing Service.

13 AMS is in turn part of a larger  
14 mission area called Marketing and Regulatory  
15 Programs. The Undersecretary of MRP reports up  
16 to USDA and the Secretary.

17 So, what's real important here is we  
18 are still very, very much in a transition period.  
19 Okay, we've just gotten our Undersecretary  
20 literally yesterday.

21 So we've had a lot of people up and  
22 down the chain in acting roles. We continue to

1 have an Acting Administrator.

2 So the next step here would be the  
3 appointment of an Administrator that follows the  
4 Undersecretary. Okay? So that's still in very  
5 much transition mode here.

6 So, it is an honor to represent these  
7 folks here today. And they all do send their  
8 welcomes.

9 Okay. Next I want to welcome our new  
10 Organic Program Acting Deputy Administrator. So,  
11 Dr. Ruihong Guo. Ruihong is going to serve in  
12 this temporary role for the next several months  
13 as the recruiting process for a permanent Deputy  
14 Administrator is underway.

15 So for the past several years, Ruihong  
16 has served as the Deputy Administrator of the AMS  
17 Science and Technology Program. She's also held  
18 a variety of other leadership positions within  
19 AMS, including serving as the Associate  
20 Administrator, and serving in a number of NOP  
21 leadership positions.

22 So, Ruihong moved into her new office

1 yesterday. Okay? And we're really, really  
2 pleased to have her with us in a leadership role.

3 For those who don't know Ruihong, here  
4 are a couple of pictures. We had a really nice  
5 welcome meet and greet with her. And so here she  
6 is with some of our NOP managers.

7 Hello? There we go.

8 Okay. And finally a hello from Team  
9 NOP. So we currently have 36 staff members. And  
10 here's our most recent team picture from last  
11 month.

12 I just wanted to give you a sense of  
13 who's on the other end of that call or email. We  
14 have five of those team members here now.

15 So, I'd like to recognize and thank  
16 them for their hard work. So I've got Dr. Paul  
17 Lewis on my left here, our Standards Division  
18 Director.

19 Lisa Brines, our National List  
20 Manager. Devon Pattillo, our Materials  
21 Specialists, and oh, so much more. And of course  
22 our Advisory Board Specialist, Michelle

1 Arsenault.

2 And so deepest thanks to all of you.

3 (Applause.)

4 DR. TUCKER: Yeah. These folks invest  
5 a tremendous amount of time for the Board. And  
6 it's a wonderful, wonderful team.

7 I'd also like to introduce David  
8 Glasgow. Who is with the AMS Public Affairs  
9 Office. So David's back there. Hi, David.  
10 Thanks for being here with us.

11 Can we just -- yeah. Thank you.

12 Okay. I would like to now turn to the  
13 2017 Sunset Review Final Rule. So, this rule was  
14 published in July 2017.

15 It removed eight substances from the  
16 National List. And the rule also renewed three  
17 substances.

18 The NOSB had recommended that those  
19 three be removed. So we wanted to explain our  
20 process here.

21 So the organic community has many  
22 opportunities to comment on proposed changes to

1 the National List. The public comment process  
2 happens at two NOSB meetings and during USDA's  
3 proposed rule public comment process.

4 Both forums, the NOSB meetings and the  
5 rulemaking process, are important sources of  
6 feedback. The final rule to re-list these three  
7 substances were the result of public comments  
8 during rulemaking.

9 Which showed that these three  
10 substances remain essential ingredients for  
11 organic handling. And alternatives are not yet  
12 available in the quantity, quality, or form  
13 needed.

14 These comments were new. Rulemaking  
15 is an important part of the National List  
16 management process. And the administration chose  
17 to heed those public comments about those three  
18 substances.

19 A key take home here is that for all  
20 interested folks to participate at all phases of  
21 the process. If you are using substances being  
22 considered for removal by the Board, let them

1 know your views.

2 If you commented before Board  
3 meetings, also comment when proposed rules are  
4 published. Very important. Okay?

5 We're also developing rulemaking to  
6 change the National List based on petitions and  
7 recommendations from the National -- from the  
8 National Organics Standards Board.

9 So this proposed rule will address  
10 recommendations that expand from 2000 to 2016.  
11 The proposed rule will include such substances as  
12 zinc sulfate, acidified sodium -- oh boy,  
13 acidified sodium chlorite.

14 I can't read my own handwriting there.  
15 Sorry. Methionine and hydrochloric acid. And so  
16 that rule is entering the clearance process.

17 Okay. Going to move onto an  
18 enforcement update and an imports update. And  
19 those are sort of hand in hand. They have been  
20 key areas of focus for us this year.

21 Enforcement and protecting organic  
22 imports are key Administration priorities. This

1 summer AMS asked the NOSB to add the topic of  
2 imports to the Board's work agenda.

3 To support this work, later this  
4 morning, there's going to be an imports panel.  
5 We're going to get multiple perspectives on this  
6 topic from the federal side.

7 And so let's take a look at some  
8 numbers. Here are some key figures to summarize  
9 our compliance and enforcement work in fiscal  
10 year '17, which ended at the end of September.

11 First, I want to highlight the current  
12 count of certified operations. As of last week  
13 there were a total of 39,035 certified operations  
14 in the organic integrity database.

15 That's almost two thousand more than  
16 we reported in January of 2017. It really  
17 demonstrates the continued growth of the  
18 industry.

19 And as a result, the enforcement  
20 numbers really need to be considered within that  
21 context. So the vast majority of organic  
22 operations are in good standing under the

1 regulations.

2 Last year there were 379 incoming  
3 complaints. And that's a little lower than in  
4 past years.

5 We found that a lot of our complaints  
6 are really questions. So we're providing more  
7 information in response to those questions.

8 Once we've answered the question,  
9 often the people contacting us are satisfied.  
10 They're happy. This has two benefits.

11 It provides better customer service,  
12 because we're helping people right up front get  
13 their questions answered. And it also allows our  
14 compliance and enforcement staff to better focus  
15 their efforts on the cases that are truly  
16 complaints with evidence about someone who may be  
17 breaking the rules.

18 We also completed 462 complaint  
19 reviews and investigations. That's a record for  
20 us.

21 And we attribute it to process  
22 improvements in the Compliance and Enforcement

1 Division. The team is focusing more on evidence  
2 collection and analysis with increased  
3 consistency between specialists.

4 During the year we levied \$187,500 in  
5 civil penalties. These mainly came from  
6 uncertified operations who had been representing  
7 products as organic.

8 Interestingly, and this does continue  
9 a trend, of the complaints last year, 75 percent  
10 were about uncertified operations. So the  
11 majority of the complaints that we review and  
12 investigate, are of uncertified operations  
13 representing themselves as organic.

14 A good part of our civil penalties are  
15 for those uncertified operations. And also for  
16 suspended operations who continue to represent  
17 themselves as organic after being suspended.

18 Finally, the Organic Integrity  
19 Database tells us that approximately 311  
20 operations were newly suspended or revoked in FY  
21 2017. That includes actions taken both by the  
22 NOP and by certifiers.

1                   We've also made significant  
2                   advancements this year in data postings on the  
3                   AMS website. So this summer, we posted a new  
4                   searchable spreadsheet of fraudulent  
5                   certificates, which makes it much easier for the  
6                   trade to search and track over time.

7                   We are also now posting enforcement  
8                   actions more frequently than in the past. You  
9                   can access appeal decisions, NOP suspensions and  
10                  revocations, and NOP settlement agreements  
11                  online.

12                  So we get lots of questions, for  
13                  example, about enforcement actions taken in the  
14                  import investigations. Keeping an eye on this  
15                  website will keep you informed about appeals and  
16                  final actions that have been posted.

17                  These are in addition to actions taken  
18                  by certifiers. As the investigations proceed, as  
19                  additional enforcement actions are taken, they're  
20                  posted here.

21                  We also have a new link on that web  
22                  page where you can quickly pull up the list of

1 suspended and revoked operations in the Organic  
2 Integrity Database.

3 Okay. Let's turn to imports. First,  
4 some context.

5 The organic industry has been  
6 experiencing tremendous growth over the last  
7 several years. Consumers continue to choose  
8 organic products.

9 This rapid growth has resulted in  
10 dramatically increased supply chain complexity.  
11 We need everyone in the organic control system to  
12 act on the implication of these changes.

13 The organic control system, which  
14 operates worldwide, includes organic standards,  
15 inspections and auditing of organic farmers and  
16 handlers, accreditation of certifiers, an  
17 enforcement process that includes civil  
18 penalties, suspensions and revocations.

19 This control system requires all  
20 actors at all levels to protect organic  
21 integrity. NOP sets standards, accredits and  
22 oversees certifiers and enforces.

1                   Certifiers complete certification  
2 actions and inspections, and investigate  
3 complaints. And need to be doing careful trace  
4 back and mass balance audits in that process.

5                   Processors and buyers of products need  
6 to be doing their due diligence in making sure  
7 the products they are receiving are compliant.  
8 It takes all of us in the system to maintain  
9 organic integrity within a rapidly growing and  
10 increasingly complex industry.

11                   So, here are some of the actions AMS  
12 has been taking over the past several months.  
13 We've issued proposed and final revocations of  
14 operations.

15                   We've issued focused directives to  
16 certifiers working in Eastern European countries  
17 of interest. Requiring increased inspections and  
18 sampling and testing of specific commodities  
19 coming out of the region.

20                   We have conducted compliance and  
21 satellite audits of certifiers operating in what  
22 have emerged as high-risk regions. Satellite

1 offices are what we call certifier branch and  
2 regional offices.

3 And, we have partnered with other  
4 federal agencies for enforcement. For example,  
5 the Animal and Plant Health Inspection Service,  
6 APHIS, and Customs and Border Protection, CBP,  
7 were recently extremely helpful in ensuring some  
8 noncompliant grains were stopped before entering  
9 the U.S.

10 Like many federal enforcement  
11 agencies, we're not always able to talk about our  
12 successes. There are some very sophisticated bad  
13 actors out there.

14 They have deep knowledge of how the  
15 system works. And they're using that knowledge  
16 to exploit the control system.

17 We're taking action. And these  
18 actions continue to be a high priority across the  
19 program.

20 This summer, we also increased our  
21 training with certifiers and handlers on how to  
22 maintain organic integrity across complex supply

1 chains. We've done live webinars for handlers,  
2 separate training with certifiers.

3 And we've posted training on the AMS  
4 YouTube site for handlers and certifiers. These  
5 posted trainings have gotten thousands of views  
6 since posting this summer.

7 In August we also posted an oversight  
8 of organic import summary of actions, reporting  
9 on the work that's been done. We'll continue to  
10 deepen our training this year with imports being  
11 one of the many focus areas at our in-person  
12 certifier training this winter.

13 As another action, last week we  
14 published a new interim instruction on organic  
15 imports. It's available in the NOP handbook  
16 online.

17 The instruction explains current  
18 regulatory requirements for certifiers overseeing  
19 organic products imported into the United States.  
20 It also recommends best practices and provides  
21 examples of actions that certifiers can take to  
22 comply with the existing regulations.

1                   The instruction covers the  
2                   certification requirements and documentation  
3                   needed to import organic products into the U.S.  
4                   It also covers certifier responsibilities in  
5                   reviewing or issuing import related documents.

6                   The document specifically emphasizes  
7                   requirements for organic system plans, audit  
8                   trail record keeping, and conducting thorough  
9                   onsite inspections. The instruction also  
10                  reiterates that foreign operations are subject to  
11                  the same requirements as U.S. operations.

12                  As we noted before, it takes all of us  
13                  working in the organic control system to protect  
14                  its integrity. This instruction provides best  
15                  practices for certifiers on how to do that.

16                  The instruction is open for comment  
17                  until December 26. So we welcome your feedback.

18                  Okay. So, as I shared earlier, the  
19                  Secretary supports our enforcement initiatives.  
20                  We're continuing our investigations of fraudulent  
21                  imports at the certifier level, at the operation  
22                  level, and when we receive evidence of

1 potentially fraudulent shipments.

2 We're following up on certifier  
3 directives, continuing to conduct certifier  
4 audits, and we're considering the feasibility of  
5 increased compliance audits in high risk regions.  
6 We've engaged a number of people in different  
7 federal partner agencies.

8 We'll talk more about that later in  
9 the presentation. We're also exploring options  
10 for standards related initiatives as well.

11 We've asked for the NOSB support in  
12 our work on imports. Again, we're having a panel  
13 later this morning.

14 We'll continue to support NOSB at the  
15 committee level. We're advancing specific  
16 technology initiatives, which I'll touch on  
17 further in a bit.

18 In short, we're working on -- in short  
19 about the technology initiatives, we're working  
20 on export certificates to support U.S. producers.  
21 We're exploring ways to communicate  
22 electronically with CBP, again Customs and Border

1 Protection.

2 We're maximizing the benefits of the  
3 Organic Integrity Database. And we're developing  
4 a concept of operations for super -- future  
5 system work.

6 We're also planning for our winter  
7 training with certifiers. Where again, imports  
8 will be a key topic.

9 To close this section, I want to  
10 emphasize that all organic enforcement and  
11 oversight rests on three core pillars, the  
12 Organic Foods Production Act, the USDA Organic  
13 Regulations, and evidence that can stand up in a  
14 court of law.

15 That's the ball game for all NOP  
16 enforcement. We hear people say, you know, this  
17 certifier must be noncompliant, because another  
18 government changed its accreditation status.  
19 This dairy must be out of compliance based on  
20 this nutrient test.

21 We must have sources of evidence that  
22 are legally defensible. We do have equivalency

1 agreements that include a mutual commitment to  
2 enforcement.

3 However, enforcement actions  
4 themselves are not reciprocal. It's our  
5 regulations that dictate the compliance of any  
6 specific certifier.

7 We do require residue testing.  
8 However, nutrient tests are not currently part of  
9 the regulations.

10 We have to govern and enforce based on  
11 the regulations and based on evidence against  
12 those regulations. When we stand before an  
13 administrative law judge, that's all that  
14 matters.

15 We enforce based on the law. And  
16 we'll continue to do so.

17 Now let's turn to a different topic.  
18 The Organic Integrity Database. I'll open this  
19 by highlighting our certified farms and  
20 businesses in Jacksonville.

21 So there are eight listings for  
22 Jacksonville. And 453 in Florida overall. You

1 can learn more about all of these businesses at  
2 the Organic Integrity Database.

3 The Farm Bill funding for technology  
4 modernization was five million dollars from 2014  
5 to 2018. Our first public release was in  
6 September 2015.

7 We launched release seven in September  
8 2017. The system does more than we thought  
9 possible when we wrote our initial needs  
10 assessment in 2013.

11 Now we have a full year remaining to  
12 make sure everything is sustainable for the long  
13 term. This is officially called operations and  
14 maintenance.

15 This allows us to really stabilize the  
16 system, fix bugs, and continue to refine reports  
17 and digital connections as needed. We were  
18 successful with this system in part because of a  
19 fabulous user group of certifiers.

20 They provided us input throughout the  
21 process. And continue to provide regular  
22 feedback. To those of you here today, I'm

1 really, really grateful for your engagement over  
2 the last few years.

3 I also want to thank the integrity  
4 team. This has been an extraordinary team to  
5 work with. The developers really, really embrace  
6 their work with us.

7 Their willingness to get into the  
8 details on certification statuses and product  
9 taxonomies, truly impressive. And we've been  
10 really lucky to work with them.

11 Now it's all about the data.  
12 Integrity has been a learning curve for  
13 certifiers and us. And as certifier staff  
14 change, they're learning the system through a  
15 whole new lens.

16 So new technologies are driving  
17 efficiency and better customer service throughout  
18 the organic control system. As we move into the  
19 long term, data quantity and quality will drive  
20 our success.

21 Here are some examples of where we'd  
22 really like to see more reporting for several

1 reasons. So, reporting of acreage. This is  
2 absolutely critical to enforcement and  
3 traceability.

4 We want to see more reporting of  
5 business types. For example, slaughterhouses and  
6 dairies. This information helps us understand  
7 the market and helps connect buyers and sellers.

8 Adoption of the product taxonomy.  
9 Better structured data is vital to provide  
10 accurate and complete reports and to track trends  
11 over time.

12 For example, we want to keep learning  
13 how much grain acreage is growing over time in  
14 different places. We need structured data to  
15 answer those questions.

16 Finally, we recently launched a  
17 Certifier Data Quality Dashboard that certifiers  
18 can see to help them assess their own data  
19 quality. This dashboard was built to help us  
20 celebrate certifiers who are investing in data  
21 quality and to motivate other certifiers to  
22 improve where needed.

1           It matters to farms and businesses if  
2           their data are up to date in integrity. The  
3           dashboard helps certifiers see where they can  
4           meet that need.

5           I also want to highlight one  
6           relatively new feature in integrity that we've  
7           built out and want folks to be aware of. In  
8           September 2016, we launched an Optional Federal  
9           Certificate Module.

10           And certificates can be -- can be  
11           generated by certifiers within the database. And  
12           then are available on the integrity website to  
13           anyone for free.

14           I want to say congratulations to the  
15           two certifiers that are already using integrity  
16           to generate operation certificates. LETIS and  
17           the Rhode Island Department of Environmental  
18           Management.

19           Certifiers can customize the  
20           certificate addenda statement, add a list of  
21           certified products, they can review draft  
22           certificates before publishing, and generate

1 batch downloads of certificates for their  
2 records. So what's the benefit of that?

3 It reduces the cost to confirm  
4 certification status. The certificate includes  
5 the USDA website address and a QR code. So  
6 anyone with a certificate can confirm its  
7 authenticity.

8 Another benefit is that it can reduce  
9 the time organic handlers and processors spend  
10 verifying the supply chain. Because it makes all  
11 the certificates that are available for  
12 operations in their search results.

13 So if a buyer wants to buy a certain  
14 commodity from producers in a certain U.S. state,  
15 if the certifier has used the product taxonomy  
16 and the integrity certificate, the buyer could  
17 access that set of producers and their  
18 certificates from integrity.

19 If you're a certifier, we encourage  
20 you to look at this capability. We really worked  
21 hard to establish it as an option for you.

22 If you're a certified operation and

1 want an integrity certificate, consider reaching  
2 out to your certifier to express that interest.

3 Next steps. As mentioned, we're  
4 continuing to emphasize data quantity and quality  
5 with certifiers using the Data Quality Dashboard  
6 as a new guide.

7 We're also able to use some of the  
8 Farm Bill investment to invest in technology to  
9 make our accreditation management processes and  
10 work flows more efficient.

11 To that end, at the start of last  
12 year, we purchased software to support the work.  
13 The system is called ACCREDIT.

14 We're also looking ahead at  
15 international activities. I'll be speaking about  
16 that later this morning during the imports panel.

17 We're working on projects involving  
18 both import and export certificates. And  
19 developing concepts for future technologies to  
20 support that work.

21 Okay. I'm going to turn to the Office  
22 of Inspector General Report. So this is the

1 first big Acronym that I'll keep on repeating,  
2 OIG, Office of Inspector General, OIG.

3 This report was published in 2017. It  
4 is available online. And includes the audit  
5 process, findings, and AMS's response.

6 So the OIG conducts independent audits  
7 and investigations of the Department programs and  
8 operations. OIG audits happen all the time.

9 They are an important part of the  
10 Department's work to enhance customer service and  
11 efficiencies. Previous NOP audits have helped  
12 the program tremendously. And this one will as  
13 well.

14 So here are some examples. There were  
15 program-wide audits in 2005 and 2010. There were  
16 National List audits in 2012. That was a no  
17 findings audit.

18 And then there were organic and milk  
19 audits in 2012 and 2013. It was actually one of  
20 the organic milk audits that led -- that drove us  
21 to complete the needs assessment that led to the  
22 Organic Integrity Database.

1                   So audits led to new successes. So,  
2                   the goal of the audit was to evaluate AMS  
3                   controls over the approval and oversight of NOP's  
4                   agreements for international trade and the  
5                   imports of organic products.

6                   There were four OIG findings. AMS's  
7                   process for determining equivalency between the  
8                   U.S. organic regulations and foreign countries'  
9                   standards were not fully transparent.

10                  Number two. Organic import documents  
11                  were not verified at U.S. ports of entry.

12                  Number three. Controls over organic  
13                  products fumigated at U.S. ports of entry were  
14                  inadequate.

15                  And number four. Onsite audits for  
16                  existing agreements were not conducted in a  
17                  timely manner because AMS has no established  
18                  requirements for frequency.

19                  Now across these four findings were  
20                  nine recommendations. And AMS proposed responses  
21                  to each of those recommendations.

22                  It's those recommendations and

1 responses I'm going to talk through next. So  
2 here's the first. And this is the one that  
3 related to transparency.

4 Organic standards around the world are  
5 generally similar, but not identical. When the  
6 U.S. negotiates with another country for  
7 equivalency, it compares the USDA organic  
8 regulations to the other country's regulations.

9 The OIG recommended that AMS  
10 publically share the differences found in that  
11 comparison. So AMS has accepted that  
12 recommendation and will implement it.

13 Now to understand the next three OIG  
14 recommendations and AMS responses, it's useful to  
15 pause to define some terms. And we're going to  
16 get into some acronyms here for folks who want to  
17 take some notes.

18 First, there's the NOP import  
19 certificate. Right now it's required for  
20 equivalence agreements like the one we have with  
21 the European Union, EU.

22 An NOP import certificate must

1 accompany every shipment of EU organic product  
2 entering the United States. The EU certifier  
3 approves the NOP import certificate to verify  
4 that the product entering the U.S. is organic.

5 Import certificates are not currently  
6 required for organic products imported from  
7 countries that don't have equivalency agreements  
8 with the U.S. Those products must be certified.

9 Next, Customs and Border Protection,  
10 that's CBP, Customs and Border Protection, has a  
11 lot of authority at the border that the U.S. --  
12 that the NOP does not.

13 CBP has a system, here's another  
14 acronym, called ACE. It actually stands for  
15 automated commercial environment. Which is why  
16 really all you have to remember is ACE. Okay?

17 That process, ACE processes import  
18 documents for products entering the United  
19 States. So all sorts of products entering the  
20 United States get entered into the system ACE.

21 Right now the ACE system does not hold  
22 organic import certificates. Here's where a new

1 term comes in, called a message set.

2 A message set is what allows the ACE  
3 system to accept and store an electronic version  
4 of the NOP certificate in addition to all the  
5 other required shipment information.

6 So, in this figure, the form on the  
7 left undergoes a technology transformation to  
8 become the message set or data stream on the  
9 right that ACE can work with. These terms are  
10 really important in understanding the next three  
11 recommendations.

12 So, we're moving onto the first of  
13 three recommendations related to import  
14 verification. So, CBP is the nation's largest  
15 law enforcement agency.

16 It has special authorities at the U.S.  
17 ports of entry. NOP enforces organic laws but  
18 has no authority at ports of entry.

19 Certifiers confirm organic compliance  
20 on both sides of the border. But we don't have a  
21 presence at the border itself.

22 The OIG recommended that AMS and CBP

1 create an official partnership so AMS can use CBP  
2 staff to check organic import certificates and  
3 make sure they are valid for organic products  
4 entering the U.S. from equivalency countries.

5 So AMS supports expanding the MOU with  
6 CBP. AMS already has an agency level MOU,  
7 Memorandum of Understanding. So we support  
8 expanding that.

9 We do know that CBP officials right  
10 now have limited capacity and no current  
11 authority to review organic imports or NOP import  
12 certificates. So we're going to develop a report  
13 outlining how AMS and CBP could collaborate.

14 Next, as I mentioned before, ACE is a  
15 system for tracking products coming into the U.S.  
16 The OIG recommended that AMS work with CBP to add  
17 instructions to ACE to explain what CBP officials  
18 need to look at on import certificates to make  
19 sure they're valid, and what to do if they  
20 suspect the paperwork or product is not truly --  
21 organic.

22 So AMS accepted that recommendation.

1 NOP import certificates right now are only  
2 required from the EU, Switzerland, Korea, and  
3 Japan.

4 So AMS is requesting access to  
5 additional areas of ACE. And we are submitting  
6 an organic message set proposal to CBP.  
7 Remember, the message set is what allows the ACE  
8 system to generate the import certificate.

9 Okay. Next, for this item the OIG  
10 recommended that AMS develop a plan to ensure  
11 that incoming organic certificates that we've  
12 been talking about are actually valid when  
13 organic produce comes to U.S. ports of entry.

14 The OIG recommended that the system  
15 also identify fraudulent certificates and gather  
16 data on organic products entering the U.S. So  
17 AMS accepted that recommendation.

18 We'll prepare a needs assessment for  
19 an organic verification system that validates  
20 organic import certificates, identifies  
21 fraudulent certificates, and captures data. This  
22 needs assessment would create a baseline for

1 future technology development work.

2 Let's do another background slide for  
3 context about the OIG recommendations related to  
4 fumigation. So, for this recommendation, we're  
5 going to talk about another key federal agency,  
6 one of our partners, again, another acronym,  
7 APHIS, part of USDA.

8 So, we're going to talk about them and  
9 CBP. So for those of you new to this discussion,  
10 here's what happens at a port.

11 So let's say a fruit shipment arrives  
12 in Florida. APHIS conducts a risk-based  
13 inspection of the container.

14 If APHIS finds -- so let's say APHIS  
15 finds a pest that could harm Florida orchards.  
16 The shipment must be treated or fumigated to  
17 enter Florida.

18 The importer is notified of the  
19 requirement. And the organic importer then has  
20 two options.

21 They can accept fumigation, selling  
22 the fruit, but not as organic. Or they can re-

1 export the shipment to a place where the pest  
2 isn't a risk.

3 Now this is happening already.  
4 Certified organic importers know that they can't  
5 sell products that have been fumigated with  
6 prohibited substances as organic.

7 If they hear that one has, those are  
8 their two options. They can sell the fruit, but  
9 it can't be labeled as organic. Or they can re-  
10 export the shipment.

11 So, with that background, let's turn  
12 to the three OIG recommendations on fumigation.  
13 OIG recommended that AMS partner with APHIS so  
14 whenever organic imports are fumigated, AMS is  
15 notified.

16 Once imported organic products are  
17 fumigated, they can't be sold as organic. Again,  
18 because they're treated with a prohibited  
19 substance.

20 So, in January of this year, AMS and  
21 APHIS executed an MOU to document collaborative  
22 efforts to identify imported organic shipments of

1 products that had been treated or are treated as  
2 a condition of entry.

3 Okay. Now we're back to ACE again.  
4 So, remember ACE is the system that CBP has to  
5 track all the incoming products to the U.S.

6 OIG recommended that AMS work with CBP  
7 to update the ACE database so it tells APHIS  
8 officials when organic imported products are  
9 fumigated for pests. And, gives them  
10 instructions for what to do next to prevent that  
11 product from being sold as organic.

12 So, we need to know what is happening.  
13 And we need to tell them what to do next.

14 For this next item, OIG recommended  
15 that AMS develop a system with procedures for  
16 tracking organic products that are fumigated so  
17 the fumigated products are not sold as organic.  
18 This information could be shared with the organic  
19 community to protect integrity.

20 So the last recommendation was about  
21 telling AMS and, and us telling APHIS what to do  
22 next. This recommendation relates to how we

1 track all this and notify the trade.

2 So AMS and APHIS are establishing  
3 procedures to notify importers and certifiers  
4 when organic products are treated and can no  
5 longer be sold, labeled, or represented as  
6 organic.

7 Okay. Now we're turning to the final  
8 OIG finding on timely audits.

9 First, OIG recommended that AMS track  
10 information about onsite audits for equivalency  
11 or recognition agreements. This would show AMS  
12 is doing audits in a timely fashion, ideally  
13 every two years as OIG recommends.

14 Earlier I told you about the ACCREDIT  
15 system which we're using to track certifier  
16 audits. AMS plans to also use that system to  
17 track and report on our reviews of trading  
18 partners.

19 Finally, and this is the ninth  
20 recommendation. OIG recommended that AMS update  
21 its procedures to specify that equivalency or  
22 recognition audits should be conducted every two

1 years.

2 Right now there is no specific time  
3 frame for equivalency audits. Only recognition  
4 agreements. We accepted that recommendation and  
5 will revise the procedure.

6 Okay. To close this section, AMS  
7 accepted all the OIG's findings and responded to  
8 all of its recommendations. And our actions will  
9 be in place by July 2018.

10 OIG reports have helped AMS shape NOP  
11 into the program that we are today. And we thank  
12 them for their work and feedback.

13 On a personal note, I started working  
14 with NOP while the -- when the program was  
15 implementing the findings from the 2010 audit.  
16 When I started as Associate Deputy Administrator,  
17 it was very clear how much that audit was serving  
18 as a critical roadmap for moving ahead.

19 The program is better because of it.  
20 This audit reaffirmed the actions that we've  
21 already started to protect the integrity of  
22 organic imports.

1           AMS is committed to that work ahead.  
2           We're going to be better because of this report  
3           and the actions that we've committed to here.

4           Final section. I am now going to go  
5           through the ANSI Peer Review of the National  
6           Organic Program.

7           Okay. So the ANSI Peer Review in  
8           2017, again, it was conducted by the American  
9           National Standard Institute, or ANSI, under  
10          contract.

11          It was done by a panel of three  
12          independent auditors. The process was driven by  
13          an NOSB recommendation, a memo to the Board in  
14          November 2014, an NOP 1031, which is in the NOP  
15          handbook, called peer review of NOP  
16          accreditation.

17          So peer reviews are a vital component  
18          of our continuous improvement. This was our  
19          second year working with ANSI. And I'm really  
20          impressed with their level of precision and  
21          detail in reviewing our documents and procedures.

22          These folks really dive into the

1       specifics. They know what our procedures say.  
2       They see what we do and how we do it. And they  
3       note discrepancies at a very granular level.

4               So the goal of the peer review is to  
5       determine whether NOP actions align with our own  
6       procedures and with ISO/IEC 17011. Which is a  
7       quality standard.

8               So the context for the peer review is  
9       for a small program serving a growing industry.  
10       We have strong and robust accreditation  
11       procedures.

12               We have public and transparent  
13       standards. We have a skilled pool of auditors  
14       who receive ongoing training. And we provide  
15       annual training and webinars to certifiers.

16               So, here's an overview of ANSI  
17       findings. Overall, NOP is following its  
18       procedures.

19               There were no major nonconformances  
20       related to accreditation decisions. The ANSI  
21       audit identified opportunities for NOP to improve  
22       record keeping and clarify procedures.

1           So, let's go through the ANSI findings  
2 related to procedures. NOP corrective actions  
3 are not tracked as described in NOP 1020.

4           So, this was our corrective action  
5 procedure. NOP needs to ensure the timely  
6 implementation of corrective actions before the  
7 next audit.

8           NOP does not have a procedure for  
9 determining the number and location of certifier  
10 satellite office audits. And NOP assessments of  
11 certifiers occur every two to two and a half  
12 years, not every one to two years as recommended  
13 in ISO 17011.

14           Okay. So, here are our corrective  
15 actions related to procedures. We have revised  
16 our procedures to monitor peer review corrective  
17 actions on our operating plan.

18           So, NOP 1020, which is the document  
19 that ANSI referenced, was the document we used to  
20 track corrective actions from peer reviews,  
21 internal audits and management reviews.

22           We found that it just became one more

1 document to try and struggle with. Which was not  
2 helpful.

3           Instead, we now correct all -- track  
4 all corrective actions through our program-wide  
5 operating plan. Which is helping build those  
6 actions into our daily work better.

7           The launch of ACCREDIT and additional  
8 staff will help accreditation time line  
9 management and satellite office tracking.

10           One action that we think would  
11 significantly help in satellite office management  
12 would be to require that all satellite offices  
13 that are currently under separate management be  
14 accredited as separate entities. So, we're  
15 currently exploring that option.

16           So, more generally, NOP continues to  
17 improve its record management. We have a  
18 dedicated quality manager.

19           We're improving our processes and  
20 training. And we're updating and retiring  
21 procedures that we no longer use, because they're  
22 built into another process.

1           Now on the final item, a corrective  
2           action related to procedures, our regulations  
3           require that accreditation renewals occur every  
4           five years. And midterm audits occur every two  
5           to three years.

6           NOP is going to review its  
7           accreditation policies and procedures to explore  
8           options for more frequent assessments. We don't  
9           currently have resources to perform onsite  
10          assessments every one to two years according to  
11          ISO 17011 recommendations.

12          We are reviewing how we could use the  
13          annual report process from certifiers for more  
14          frequent follow ups.

15          Here are ANSI's findings related to  
16          records. NOP didn't complete the review section  
17          of accreditation application documents.

18          There were some instances of incorrect  
19          versions or incomplete records. So, for example,  
20          a date was missing or a signature was missing.

21          NOP accreditation certificates do not  
22          contain the certifier's full address, and do not

1 indicate the current version of 7 CFR, part 205.  
2 And there was one isolated instance of a date  
3 discrepancy.

4 So as I mentioned before, ANSI reviews  
5 are very detailed and precise. And so these  
6 findings are very specific.

7 So, here are corrective actions  
8 related to records. We do conduct robust  
9 certifier audits of new applicants, midterms and  
10 renewals.

11 In fact, AIA, the division that's  
12 responsible for that, Accreditation of  
13 International Activities, they conducted 60  
14 audits last year. Including midterms, renewals,  
15 desk audits, witness audits, peer reviews, and  
16 recognition audits.

17 These activities take significant  
18 amounts of time. So for those new to the  
19 process, take a look at NOP 2000 and 2005 in the  
20 public handbook.

21 These walk through the detailed  
22 processes that our auditors use as well as their

1 checklist.

2 We are refining our application  
3 processing approach. So when ANSI found that we  
4 had not completed the review section of an  
5 existing form, that's because that information is  
6 now stored elsewhere. It's in a different form.

7 So, it's not that we're not doing it.  
8 It's that we're doing it in a different place  
9 than our procedure says we are doing it.

10 So we need to update our procedure to  
11 report accurately where all of these activities  
12 are happening across this robust process.

13 We have instructed auditors about  
14 required signatures on certain forms. We will  
15 continue to train on this.

16 We're going to revise our  
17 accreditation certificate template to reference  
18 the current regulations and include the  
19 certifier's complete address. And we'll review  
20 our procedures related to accreditation  
21 certificate issue dates.

22 So, in closing, peer reviews are a

1 vital part of our quality system. The 2018 Peer  
2 Review, which will also be with ANSI, will start  
3 in the spring.

4 In the meantime, we're going to post  
5 the ANSI report and our NOP corrective actions.  
6 We're going to continue to advance our records  
7 management practices, refine our accreditation  
8 processes, continue to launch technology aids,  
9 and conduct regular training for auditors and  
10 certifiers.

11 And so we pass along a big thank you  
12 to ANSI and the audit team.

13 And that's it. I'm going to close by  
14 again thanking you all for being here. And for  
15 all the work you're doing to protect organic  
16 integrity around the world.

17 I am now happy to take some questions  
18 from the Board.

19 (Applause.)

20 MR. CHAPMAN: Thank you Jenny. You  
21 had some big shoes to fill there for Miles' usual  
22 update. And you filled them well. So thank you

1 very much.

2 I will now open it up to questions  
3 from the Board. Do we have any questions? I see  
4 Harriet.

5 MS. BEHAR: I have a few questions.  
6 But, maybe I'll do just one or two and then go  
7 around to other and then you can come back to me.

8 So just based on the report that you  
9 just gave us, thank you, Jenny, for being so  
10 detailed and comprehensive.

11 The fumigation system that you have  
12 now that's dealing with notifying the certifiers  
13 of what's been fumigated, that came in as organic  
14 but should no longer be sold as organic, I'm  
15 wondering if that could also be somehow, be put  
16 up on the website?

17 Because I think the buyers need to  
18 know. Many times this -- notifying the  
19 certifier, it might be a little late for the  
20 buyer to realize that they are bringing in a  
21 product that maybe didn't -- no longer had the  
22 organic integrity that it should have.

1                   So, I'm just wondering about posting  
2                   that. And then the second, on the -- I'm  
3                   wondering about at imports -- oh --

4                   MR. CHAPMAN: Let's do one question at  
5                   a time. And I'll go back to you.

6                   MS. BEHAR: Okay.

7                   DR. TUCKER: Thank you. I think the  
8                   work we're going to do over the next several  
9                   months will, I think, identify both components.

10                   It's how does everybody inform each  
11                   other? So certifiers and also the trade.

12                   So, how do you get information out of  
13                   the systems, transmit it to the right people in a  
14                   timely manner, alert the trade to anything that  
15                   might be coming in that should not be sold as  
16                   organic?

17                   That will all be part of sort of the  
18                   system and concept of operations that we work on  
19                   in the next several months. So, agree that  
20                   that's very important.

21                   MS. BEHAR: Then I'm wondering about  
22                   looking at the NOP program manual. And actually

1 have some system for managing risks.

2 So you mentioned about that if an  
3 accredited certifier who was under an equivalency  
4 agreement with another entity, revoked or had its  
5 certification -- its accreditation revoked. That  
6 we couldn't revoke their accreditation under the  
7 equivalency agreement without evidence.

8 But, I'm wondering if we couldn't have  
9 something in the program manual that would then  
10 at least bring extra scrutiny to that accredited  
11 certifier? Because there's obviously a risk  
12 that's going -- that another entity has  
13 identified.

14 So I'm just wondering if we couldn't  
15 improve our program manual to bring up the  
16 procedures there?

17 DR. TUCKER: Yeah. Risk-based  
18 oversight and audits is something that we're  
19 spending a lot of time talking about. So, how do  
20 we, both in our enforcement and surveillance  
21 programs, take more of a risk-based approach?

22 And so that's something that is of

1 great interest in the program. We have done  
2 increased compliance audits and increased  
3 satellite office audits in response to some of  
4 those risks.

5 But yes, that is an area that we're  
6 very interested in looking further at. Thank you  
7 for the questions.

8 MR. CHAPMAN: Dave?

9 MR. MORTENSEN: Yes. Thank you Jenny  
10 for that overview of things. That was quite  
11 detailed.

12 And I have a question. You said that  
13 AMS has accepted the findings and AMS will act on  
14 the findings by July 2018. That's pretty soon, I  
15 think. Less than a year.

16 And I'm just wondering, has there been  
17 a kind of a mental sensitivity analysis done on,  
18 you know, what are the -- what are the big  
19 hammers?

20 And what are the tweaks out of those  
21 nine that are -- that really need attention first  
22 in order to make the greatest improvement in the

1 integrity in the system?

2 If everything wasn't done by 2018,  
3 July 2018.

4 DR. TUCKER: Good question. So let me  
5 sort of clarify the July 2018 date. Right?

6 So the way OIG audits work is that we  
7 do responses where we need to have responses to  
8 everything in a year. It does not mean the work  
9 will be done in a year.

10 So for example, a couple of these  
11 recommendations are things like needs assessments  
12 and concepts of operation. So that doesn't mean  
13 we'll have a system built by July 2018, it means  
14 we'll have a concept of operations and plan for a  
15 system developed by then.

16 And that's actually worked in the  
17 past. We did the same with the Organic Integrity  
18 Database.

19 We put a needs assessment out there in  
20 2013. It was -- it sparked an awful lot of  
21 feedback and conversation, this is what we need.  
22 Is this not what we need?

1           So for example, back to Harriet's  
2 question about well, how do you alert certifiers  
3 and trade? A concept of operations might lay out  
4 some, here are some options for doing that.

5           Which would then generate feedback  
6 about okay, is that the right way of doing it?  
7 Is there another way of doing it?

8           In terms of the big hits, those are  
9 things we're doing already. So, separate from  
10 the OIG audit.

11           We're continuing to do certifier  
12 audits. We're continuing to look at these risk-  
13 based approaches. We're continuing to track  
14 ships.

15           So those are actions that we are  
16 taking. We'll continue to take concurrently with  
17 looking longer term, is what is the capability  
18 development that has to happen to sort of  
19 accommodate the growth of this industry?

20           That's something again we invite  
21 everyone to take a look at. You know, it's not -  
22 - so NOP will do it's -- what it can do in the

1 system. But industry owns a part of this, the  
2 certifiers own a part of this.

3 So, I think as we're working on the  
4 OIG audit, starting to put materials out there  
5 that will also feed feedback about well, what is  
6 everybody else doing? And how do these all touch  
7 together in the long term?

8 Does that make sense? And does it  
9 answer your question?

10 MR. MORTENSEN: I think it makes  
11 sense. I, you know, I'm the "scientist" on the  
12 Board. But I work a lot and interact a lot with  
13 grain growers and -- grain growers.

14 And I hear a lot of concern about how  
15 quickly we can improve the integrity of the  
16 shipments coming in. And the concern about its  
17 impact on price, et cetera, et cetera.

18 DR. TUCKER: Yeah.

19 MR. MORTENSEN: So, I think as we move  
20 forward, it will be very helpful to have a sense  
21 for how quickly we can improve the system in a  
22 way that's going to make a difference to folks on

1 the ground.

2 DR. TUCKER: Yeah. I would say also  
3 that good science is supported by good data.  
4 Which is why I emphasized so much the importance  
5 of the Organic Integrity Database and reporting  
6 of things like acreage data.

7 We really need that data both  
8 domestically and abroad. And I think that data  
9 will also help support sort of more science-based  
10 actions and faster actions.

11 So we understand the landscape better.  
12 Yeah. Thank you. Good question.

13 MR. CHAPMAN: So I have a quick follow  
14 up question. Then I'll go to Emily and Francis.

15 I also want to just put a quick  
16 reminder out. I'm not trying to discourage  
17 import related questions.

18 But we do have that import panel of  
19 experts which Jenny is a part of. So we'll have  
20 additional time at that time to ask it as well.

21 I see you as well, Harriet.

22 Really quick follow up. You mentioned

1 acreage data, Jenny, domestic and abroad. What's  
2 the -- how would we go about accumulating that  
3 information?

4 As my understanding now it's not  
5 required to be listed on organic certificates?

6 DR. TUCKER: Right. It's also not --  
7 it's not required in the Organic Integrity  
8 Database.

9 And so that's where we'd really like  
10 to have the data. Is the system will allow for  
11 operation level reporting of acreage data.

12 And also has -- there are ways where  
13 certifiers have figured out how to report it on a  
14 field basis. And it's not just acreage, it's  
15 also livestock counts.

16 So the system is set up to accept that  
17 data. Not a lot of certifiers are providing that  
18 data right now.

19 So we're really trying to emphasize  
20 the importance of that data coming into the  
21 system.

22 MR. CHAPMAN: And then the OID itself

1 is not applicable to equivalent countries. And  
2 so how do we --

3 DR. TUCKER: You mean Integrity  
4 Database?

5 MR. CHAPMAN: Yeah.

6 DR. TUCKER: Right.

7 MR. CHAPMAN: How do we deal with that  
8 gap?

9 DR. TUCKER: It's a good question. So  
10 I think a lot of other countries are looking at  
11 the Organic Integrity Database as a model for the  
12 kinds of systems they could stand up.

13 Right now they're -- right now there's  
14 no plans to include equivalency countries in the  
15 Organic Integrity Database. Its operations are  
16 certified to the U.S. standards.

17 However, we -- I think conversations  
18 happen with other countries about what systems  
19 they have. We have built a very public data  
20 dictionary.

21 And we publish all of our, what are  
22 called APIs, application programming interfaces.

1 So anyone can take our data, can grab our data,  
2 the publically available data and use that  
3 information.

4 MR. CHAPMAN: Emily?

5 MS. OAKLEY: I have two questions. Do  
6 you want me to ask the first one first?

7 I was wondering if you had any sense  
8 of when you would be announcing the new position  
9 who will be replacing Francis's seat?

10 DR. TUCKER: Which position? I can't  
11 -- oh, Francis's. Sorry. There's a little bit  
12 of an echo.

13 So, we got some very qualified  
14 candidates for that seat that's becoming vacant.  
15 That application review process is still  
16 underway.

17 So, we would anticipate an  
18 announcement in the next few months.

19 MS. OAKLEY: Okay. And then my second  
20 question is related to complaints. I believe you  
21 stated that 75 percent of the complaints are  
22 regarding non-certified operations that are

1 representing their products as organic.

2 And I know that with the limited staff  
3 there are constraints into how quickly you guys  
4 can resolve those complaint issues. But, I know  
5 I've actually submitted one, and it's been over a  
6 year since it's been through the pipeline.

7 And I'm wondering what are some of the  
8 things that could be done to help speed up that  
9 process short of additional staff?

10 DR. TUCKER: Okay. Good question.  
11 So, how are we -- we are -- we are re-looking at  
12 the overall complaint management process.

13 So I shared that we're taking in some  
14 of the intake. That's actually helping a lot.

15 That's been introduced in the last few  
16 months. And it's already making a significant  
17 difference.

18 So I'm going to give a real example.  
19 We used to get complaints and -- well, we still  
20 get emails in saying, well, how do I know that  
21 Farmer Brown is organic?

22 Right? And so you can hear that in

1 two ways. How do I know Farmer Brown is organic?  
2 Or I can hear, hey, how do I know Farmer Brown's  
3 organic?

4 And so it turns out that a lot of them  
5 are that hey, how do I know? They're just  
6 questions. They're not, I think he's falsifying.

7 And so when we've trained our intake  
8 specialist to recognize the difference and to ask  
9 the right questions right up front. Which takes  
10 care of a lot of those.

11 Because we can answer the question.  
12 And then our analyst doesn't need to spend the  
13 time looking up, is he in the Organic Integrity  
14 Database? Is he certified? Is he currently  
15 certified?

16 And so there's a whole service out  
17 there. We're also teaching the staff more about  
18 risk-based approaches in terms of how do you  
19 quickly look at an incoming complaint? And how  
20 do you quickly get information out?

21 So, for example, some folks are  
22 selling as organic. They still don't know that

1 there are laws related to that.

2 And all you have to do is send them a  
3 letter saying, did you know there are laws  
4 related to that? Stop doing that. And they stop  
5 doing that. Oh, I'm so sorry. Let me stop doing  
6 that.

7 And so I think the trick is getting  
8 those letters out faster. So we have a new  
9 Compliance and Enforcement Director, Betsy  
10 Rakola.

11 She is doing a superb job of  
12 recognizing those opportunities and implementing  
13 them very, very quickly. So, we're really  
14 pleased by how that's playing out.

15 And I think the numbers are going to  
16 continue to reflect that over time.

17 MR. CHAPMAN: Francis?

18 DR. THICKE: Thank you Jenny for your  
19 informative presentation. I have a question  
20 about one of the enforcement actions taken this  
21 year.

22 It has to do with the 15,000 cow dairy

1 in Colorado that was alleged to not be grazing.  
2 And recently the response of the Compliance  
3 Department was that it was in full compliance.

4 And it's a lot surprising to some  
5 people. I'd like to have some more information  
6 about how that was come to that conclusion.

7 DR. TUCKER: Okay.

8 DR. THICKE: We've all seen -- in fact  
9 just to preface it, we've seen the articles in  
10 the Washington Post that they had investigated  
11 over three months, eight times they had  
12 investigated that scene.

13 Fewer than 10 percent of the cows  
14 grazing. And they had done tests on omega-3  
15 fatty acids and conjugated linoleic acids, and  
16 found they were on the level of conventional  
17 agriculture.

18 And so I called the Compliance Officer  
19 at NOP to see did you schedule this ahead of  
20 time? Or did you do it unannounced?

21 And she told me that they scheduled it  
22 ahead of time. So I was really concerned that

1 you would do that, come one day and tell them you  
2 were coming so they could put the cows out and  
3 conduct -- do what they had to do with their  
4 records.

5 And it's a real concern for me. Are  
6 you going to be looking more into that?

7 DR. TUCKER: Okay. Thanks for the  
8 question Francis. You know, I can't comment on  
9 the specifics of any particular investigation.

10 I will mention that unannounced  
11 inspections are very, very important tools in the  
12 organic control system. Very important and NOP  
13 does conduct unannounced inspections.

14 We also rely on certifiers to do  
15 unannounced inspections. In fact they're  
16 required to do up to five percent a year  
17 unannounced inspections.

18 So, they are a very important tool in  
19 the compliance tool box. As I mentioned earlier,  
20 the evidence needs to be what is in -- against  
21 what's in the regulations.

22 So nutrient levels are not part of the

1 regulations right now. So that's not -- it's not  
2 a regulatory criteria against which compliance  
3 can be evaluated.

4 And really, there's no substitute for  
5 the annual inspection of getting into the farm.  
6 Of walking the fields. Of reviewing the records  
7 in real time onsite.

8 And so trained auditors go onsite and  
9 they review these records. And they look at the  
10 practices. They look at the animals. They look  
11 at the pastures.

12 They see what's going on across the  
13 entire farm. And so there's really not a  
14 substitute for that kind of robust inspection.

15 DR. THICKE: Okay. Thank you.

16 DR. TUCKER: So, unannounced  
17 inspections as I mentioned earlier, we are  
18 continuing to look at how risk-based inspections  
19 could feed more into the system.

20 And so I think unannounced inspections  
21 are a good tool in that risk-based framework.

22 DR. THICKE: But I would point out

1 that the Washington Post article indicated that  
2 the inspection was done by the certifier after  
3 the grazing season. So there was no way they  
4 could know if they were grazing.

5 And this is a real concern. Because  
6 a lot of small dairy farmers are suffering  
7 greatly. And there's a huge oversupply of milk.

8 And the same organization is going to  
9 be an -- they're announcing they're going to put  
10 30,000 cows in Missouri. So, I would really urge  
11 stronger kind of enforcement on this.

12 I'm reminded of this thing with CLAs  
13 and omega-3s, that they are pretty good evidence.  
14 And the fact that there are pictures of cows not  
15 grazing, it reminds me of Henry David Thoreau  
16 once said about dairy farmers in his day that  
17 were diluting milk with water.

18 And he said, sometimes circumstantial  
19 evidence can be very great, like when you find a  
20 trout in the milk.

21 And so I think that we have to be a  
22 little stronger on some of these things. I would

1           urge you to do that. Thank you.

2                           (Applause.)

3           MR. CHAPMAN: Thank you everybody.

4           DR. TUCKER: Thank you for the  
5 feedback Francis.

6           MR. CHAPMAN: Harriet?

7           MS. BEHAR: I have two questions.  
8 First for Jenny and the second for Paul.

9                        So, I just wanted to know if there has  
10 been any thought with this risk-based, as well as  
11 the new procedures for the import, if that will  
12 be translated into new questions on the  
13 accreditation auditor's checklist?

14                       And more training for -- I know you're  
15 doing some training for certifiers. But I want  
16 to make sure too that at the accreditation level,  
17 when they are being -- going through their  
18 accreditation that these new procedures are going  
19 to be translated into a checklist, you know,  
20 sooner rather than later?

21           DR. TUCKER: So I would say the  
22 checklist is always evolving as we continue to

1 find new things. Right?

2 As the industry continues to grow and  
3 change, new things get added to the checklist. I  
4 would -- I would also say in addition to our  
5 auditors being well trained and looking for a  
6 risk-based, we also need certifiers to be making  
7 sure that all their inspectors know how to do  
8 trace-back audits. How to do mass balance  
9 audits.

10 So, inspector training is as important  
11 part of a risk-based system. So, all the  
12 certifiers need to take responsibility to make  
13 sure the inspectors that they are putting on the  
14 ground can also do that kind of risk-based  
15 assessment.

16 MS. BEHAR: And then for Paul. I know  
17 that the Materials Subcommittee has put forward  
18 for a work agenda item, a comprehensive review of  
19 sanitizers, disinfectants, the products that are  
20 in contact with organic foods.

21 And I'm wondering where that is in the  
22 process? And we did kind of put that forward to

1 help both the NOSB and their deliberations when  
2 we get new sanitizers, et cetera -- petitioned,  
3 so we can see where they fit in the greater  
4 picture.

5 And see if there's any holes or, you  
6 know, where they're needed. Certain, you know,  
7 environments that they work in, or whatever.

8 As well as for the trade. So they can  
9 see where there possibly are holes or  
10 duplications as we have petitions and go through  
11 sunset.

12 So where is that standing now?

13 DR. LEWIS: Sure. So thank you  
14 Harriet. So we just received that request for a  
15 work agenda item from the Board.

16 So thank you for that. This is  
17 something that I know that we've been talking to  
18 the Executive Committee about this work agenda  
19 item.

20 As Dr. Tucker just mentioned, we have  
21 new leadership in transition with the National  
22 Organic Program, Dr. Guo. So, I'm looking

1 forward to talking to her and familiarizing her  
2 with that information.

3 One thing to think about, as this work  
4 agenda item is being developed, as the public  
5 knows, we have an open docket system. So, if you  
6 have information that could help the Board  
7 explore this topic in terms of are there  
8 particular sanitizers that may be useful for a  
9 particular use on a particular substrate, that  
10 would help the Board in terms of some of its  
11 work.

12 So again, you know, use the public  
13 comment opportunity, especially written comments  
14 to help educate the Board and help the Board with  
15 its work.

16 MR. CHAPMAN: Ashley?

17 MS. SWAFFAR: Thanks for your update,  
18 Jenny. You snuck in there a little bit about  
19 methionine.

20 I'd just like to know a little more  
21 about where that is in the process.

22 DR. TUCKER: So there is a -- there is

1 a proposed rule that has been drafted and has  
2 entered the early clearance process.

3 So, when that rule makes it through  
4 clearance, then it would be announced, a standard  
5 process that any proposed rule once it's -- goes  
6 through clearance would be published for public  
7 comment.

8 MS. SWAFFAR: Thank you.

9 DR. TUCKER: Thank you.

10 MR. CHAPMAN: Dave?

11 MR. MORTENSEN: Jenny, the Board is --  
12 and the Materials Subcommittee is wanting to move  
13 ahead with amending the inert ingredients list.  
14 This has been something that the Board over the  
15 years has worked on.

16 In 2010 the EPA moved away from the  
17 EPA List Four to their new Safer Choice Program  
18 for compounds. The Program is supported by EPA.

19 And it would provide a framework by  
20 which inerts involved in organic production can  
21 be critically evaluated for inclusion on the  
22 National List.

1           In order for us to move ahead with  
2 this, we are going to need to have a Memorandum  
3 of Understanding. Some sort of open and active  
4 dialog between EPA, NOP and members of the  
5 Materials Subcommittee on the NOSB.

6           And we're poised to move ahead with  
7 that. And what we're going to need is the MOU to  
8 get the crosstalk going between the agencies.

9           DR. TUCKER: Right. So we have that  
10 item. We're very aware of that item.

11           We're still going through transition.  
12 EPA is also still going through their transition.

13           So I would say as both departments and  
14 agencies find their way in the new administration  
15 that that is a conversation that we'll have in  
16 terms of how do we proceed with that.

17           DR. LEWIS: If I could just add, just  
18 about that comment. Is that this is one thing,  
19 Dave, that we're aware of.

20           We've had a number of interactions  
21 with EPA with Office -- that Program colleagues.  
22 So, this has been a dialog we've had over the

1 years.

2 And this is a topic that we're looking  
3 forward to presenting to Dr. Guo. And with the  
4 new administration coming onboard in terms of  
5 prioritizing.

6 MR. MORTENSEN: I'm just curious.  
7 Because I was very involved with the EPA when I  
8 was -- during the Obama administration.

9 Do we have some sense for how long  
10 this will take?

11 DR. TUCKER: I do not.

12 MR. MORTENSEN: Are there active  
13 discussions underway where, you know, where this  
14 is being entertained as something we can get  
15 going?

16 DR. LEWIS: We've had ongoing  
17 discussions with OPP and EPA.

18 MR. MORTENSEN: Um-hum.

19 DR. LEWIS: So, you know, again as  
20 folks come onboard we'll see in terms of the  
21 timing of that activity.

22 DR. SEITZ: Jenny, if I understood

1 correctly from your presentation, if the NOSB  
2 recommends removal of a substance from the  
3 National List, and then there's subsequent  
4 rulemaking and there's public comment that is  
5 strongly in favor in keeping that on the list and  
6 there may not be any public comment, further  
7 public comment on removal that there still is  
8 discretion on the part of the USDA to keep that  
9 substance on the list.

10 In other words, the recommendation  
11 from the Board may not necessarily be acted upon  
12 in the way that the Board recommends. Is that --

13 DR. TUCKER: Your interpretation is  
14 correct.

15 DR. SEITZ: Yeah. So, in other words  
16 if there were people who presented testimony or  
17 advocated the removal of a substance, they should  
18 be aware that during subsequent rulemaking, they  
19 may want to -- they may want to provide public  
20 comment again, just to make sure that that's  
21 finally acted upon.

22 DR. TUCKER: That's why I emphasized

1 that process.

2 DR. SEITZ: Yes. Okay. I just wanted  
3 to be clear on that.

4 DR. TUCKER: It's really important --  
5 yeah. So it's important for folks who are using  
6 materials to say that during the Board process.

7 And there are people who -- for folks  
8 who want to advocate removal, it's important for  
9 them to say that during the rulemaking process  
10 and vice versa.

11 So, it's important for everyone to  
12 participate throughout the process. Because both  
13 parts are important, the Board public process and  
14 the rulemaking public process. Yeah.

15 MR. CHAPMAN: Harriet?

16 MS. BEHAR: Just a quick comment on  
17 the inerts. I'm hoping as we work through --  
18 you, the NOP works through the MOU with the EPA  
19 that you'll come back to the NOSB in case we have  
20 some input into possible additions or  
21 modifications to that MOU.

22 Because you know, we are in charge of

1 materials. And those inerts are, I mean, not  
2 ultimately, but in the review.

3 So, we would like to make sure that  
4 that MOU is robust. And really does meet the  
5 criteria of the EPA.

6 DR. TUCKER: Yeah. I would assume  
7 that be a collaborative process. Absolutely.

8 MR. CHAPMAN: Jenny, I have a  
9 question. First of all, I was happy to hear of  
10 the -- I guess appointment or hiring, I don't  
11 know what the correct term is.

12 But the hiring, I guess of Acting  
13 Deputy Administrator Ruihong Guo. It's great to  
14 see a familiar face in that role in this  
15 transition period.

16 But can you go through a little bit  
17 the process of finding a permanent Deputy  
18 Administrator? And what that looks like?

19 DR. TUCKER: Sure. So I can talk  
20 through sort of the generalized process of how  
21 this works.

22 The NOP Deputy Administrator position

1 is what's called a career senior executive  
2 service position. That's another acronym, SES.  
3 SES stands for senior executive service.

4 So I'm going to now use SES. So SES,  
5 career SES positions are -- go through a very  
6 structured and lots of procedures associated with  
7 that kind of hiring process.

8 So what will happen is that generally  
9 for SES, career SES positions, they will be  
10 announced on a website called USAJOBS. So you  
11 can just type into Google, USAJOBS.

12 And it will put the job announcement  
13 out there. You can go out into USAJOBS now and  
14 search for SES and it will come up with all the  
15 SES positions across federal agencies.

16 That announcement will include a job  
17 description. It will also include what's called  
18 executive qualifications.

19 Those are sort of five categories of  
20 executive qualifications that anyone applying for  
21 the SES must meet. And then there are also a --  
22 generally a set of technical qualifications.

1           So those are specialized sort of  
2 technical experience that one needs for the job.  
3 So, that application window is also set by  
4 regulation in terms of how long the position must  
5 be open.

6           Applications will come in. They are  
7 then reviewed by an initial panel. And then they  
8 go through a hiring manager process that involves  
9 interviews.

10          The process can take a while. So,  
11 we're -- it's about usually somewhere between six  
12 to nine months. Which is why we have an Acting  
13 Deputy Administrator.

14          So generally, if you're going to have  
15 a vacancy at the SES level, they like to put in  
16 temporarily another SES. So somebody who's  
17 already in the SES corps into the position during  
18 that hiring period to provide that continuity.

19          Does that --

20          MR. CHAPMAN: Yes. Thank you. All  
21 right. I'm not seeing any more questions.  
22 Jenny, thank you so much for --

1 MR. MORTENSEN: I have one more  
2 question.

3 MR. CHAPMAN: Oh, I'm sorry. Dave, go  
4 ahead.

5 MR. MORTENSEN: As a university person  
6 I get involved in a lot of searches, job searches  
7 that is. And I'm curious, who appoints the  
8 search committee?

9 DR. TUCKER: Who appoints the search  
10 committee? Okay. So, initially the way SES  
11 hiring works, and this is all on the OPM website.

12 So if you're interested in how this  
13 works, the OPM, which stands for Office of  
14 Personnel Management. Sorry, another acronym  
15 there.

16 Office of Personnel Management is the  
17 office that dictates how this kind of hiring  
18 happens. How all federal hiring happens.

19 And so there is a screening process  
20 that involves other SESs in different agencies  
21 that review the applications. Because they're  
22 interested not only in technically are you able

1 to do this job, but do you have the skills and  
2 the executive qualifications to be in the corps  
3 itself, the senior executive corps itself?

4 So, there will be review panels of  
5 folks outside the agency at the SES level that  
6 will review applications. And then the panel  
7 within the agency to do the interviews is  
8 selected by the Administrator's office.

9 MR. MORTENSEN: The Secretary --

10 DR. TUCKER: So right now Bruce is --  
11 Bruce Summers is the Acting Administrator.

12 MR. MORTENSEN: Okay.

13 DR. TUCKER: And so he would be the  
14 one that would convene that panel generally.

15 MR. MORTENSEN: Um-hum. Okay.

16 Thanks.

17 MR. CHAPMAN: All right. Thank you  
18 Jenny very much for your time and comments.  
19 We'll now move on the agenda to the NOSB report.

20 So I'll try to keep it brief. But as  
21 I was writing this up last night, I realized I  
22 kept going on and on.

1                   But I am what separates us from break.  
2                   So, I will try to keep it brief.

3                   (Laughter.)

4                   MR. CHAPMAN: This is our first  
5                   meeting back in Florida after a long time. And  
6                   I'm happy to be here.

7                   Florida is home to -- Jenny kind of  
8                   stole some of my fire with her love of  
9                   agricultural statistics. But, home to over 450  
10                  certified operations, and one that she didn't  
11                  mention, 72 million dollars of sales from organic  
12                  farmers and ranchers.

13                  In April I started our meeting then  
14                  talking about the weighty issues we have on our  
15                  work agenda. Most of those still remain. And we  
16                  now have several more.

17                  The organic community has come far  
18                  over the years. And yet we continue to struggle  
19                  with the issues that affected us from the very  
20                  earliest days.

21                  With concerns over integrity, disputes  
22                  over standard setting, regional differences that

1       come consider shortcutting, or diminishing their  
2       view of what organic is. Even the areas where we  
3       agree, we continue to struggle with working  
4       within the confines of a federal administration  
5       in dealing with various regulatory hurdles that  
6       that entails.

7                   When I get discouraged by the  
8       challenges we face, I find reassurances in  
9       looking back and taking stock of how far we've  
10      actually come. Organic has gone from a fringe  
11      program at the USDA to one of the most prominent  
12      and public programs of the AMS.

13                   And while we still struggle to get the  
14      appropriate funding and staffing to support the  
15      system, it's still far better than where we  
16      started. I'm heartened by the progress of our  
17      discussions. And that we've moved beyond blunt  
18      topics.

19                   For example, the exclusion of GMOs to  
20      more nuanced topics like discussing specific  
21      genetic methods that are prohibited. And while  
22      nuanced topics are no easier than the blunt ones,

1 it's still progress that the conversations have  
2 moved along.

3 The organic community has always been  
4 made up of a patchwork of different folks  
5 motivated for different reasons, coming together  
6 for a common cause around an alternative path for  
7 organic -- for agricultural production and  
8 consumption.

9 This path has multiple aspirations.  
10 And it's difficult at times to balance these  
11 multiple aspirations when pulled in different  
12 directions.

13 Some view this is as dysfunction. I  
14 view this as a product of a passionate and  
15 engaged diverse community.

16 The very attribute that makes a  
17 community so resilient that it continues to bring  
18 farmers and consumers together, growing the  
19 organic movement and marketplace.

20 Back in April I also asked for the  
21 public's patience during this time of transition  
22 of administrations. And unfortunately I will

1 need to make that same ask today.

2 Six months after our meeting in April,  
3 we do have a Secretary of Agriculture now, a  
4 Deputy Secretary and an Undersecretary.

5 But we're still working with an Acting  
6 AMS Administrator. And as everyone is aware,  
7 with Miles's retirement, we now have an Acting  
8 Deputy Administrator of the NOP as well.

9 I'd be remiss if I did not say that I  
10 missed Miles. Although I do enjoy Jenny and  
11 Paul's company up here.

12 He was a strong advocate for organic  
13 within the USDA. And was critical to allow the  
14 progress I mentioned earlier.

15 However, Miles's legacy lives on.  
16 Especially in the strong staff that he recruited  
17 during his tenure, like folks like Jenny and  
18 Paul, Lisa, Michelle, and Devin. And with them  
19 we'll continue to be in good hands.

20 I also look forward to working with  
21 the new Acting Administrator, Ruihong Guo. And  
22 continuing to make progress on our work agenda.

1           We have 13 and a half hours dedicated  
2 to public comment. I'm not going to go into the  
3 stats, because again, Jenny loves stats as much  
4 as I do. And you saw them earlier.

5           But from the numbers you can tell, we  
6 have a very engaged public. And we appreciate  
7 and value those comments. I'm always impressed  
8 with the range and thoughtfulness of the comments  
9 we receive.

10           I also want to welcome my fellow NOSB  
11 family members. And that's what you guys feel  
12 like these days, like family members. While you  
13 may not always agree with your family, you've  
14 still got to love them.

15           Your service and time commitment is  
16 amazing. And I thank you for your thoughtful  
17 engagement, careful reflection, and respectful  
18 debate.

19           Your commitment to the organic  
20 community is invaluable. And I thank you for  
21 your countless hours, unpaid, away from your  
22 farms, your businesses, your research, away from

1 your students and colleagues, and most  
2 importantly, time away from your family.

3 With that I'm going to move onto some  
4 housekeeping items. And first off, I'd like to  
5 review the NOSB conflict of interest policy in  
6 accordance with our policy and procedures manual.

7 NOSB members are classified as  
8 representatives under the Federal Advisory  
9 Committee Act. And each representative is  
10 appointed to articulate view points and interests  
11 of a particular interest group.

12 The Organic Food Production Act  
13 prescribes these interest groups, which include  
14 farmers and growers, handlers and certifiers,  
15 environmentalists, conservationists, scientists,  
16 consumers and public interest groups, and  
17 retailers.

18 As such, NOSB members are not expected  
19 to provide independent expert advice, but rather  
20 advice based on the interest of the group served.  
21 NOSB members represent interests of a particular  
22 group such as many of the -- as such, sorry.

1 It's a flip flop of words there.

2 As such, many of the interests are  
3 acceptable interests. An interest is acceptable  
4 if carried out on behalf of the represented  
5 group. And if the Board member receives no  
6 disproportionate benefit from expressing the  
7 interest.

8 True conflicts of interest arise when  
9 an interest one, directly or disproportionately  
10 benefits you or a person associated with that  
11 member; or two, could impair the objectivity of  
12 the member in representing their group; or three,  
13 has the potential to create an unfair competitive  
14 advantage.

15 The appearance of a personal conflict  
16 or loss in partiality while not a true conflict,  
17 must also be considered when conducting NOSB  
18 business.

19 Once discussion documents and  
20 proposals are posted for public comment, each  
21 NOSB member is to review the documents across  
22 outside committees and research any potential

1 conflicts of interest due to the organizational  
2 affiliations and relationships.

3 Prior to the meeting, the program  
4 provides a matrix, which is now being displayed,  
5 to all NOSB members that lists the items being  
6 considered at the meeting. Members use this  
7 matrix to disclose conflicts of interest and for  
8 us to reference for any recusals when voting on  
9 items.

10 If an individual is unsure if they  
11 have a conflict of interest, then the question is  
12 posed to the NOP's DFO. And working with the  
13 USDA Office of Ethics as needed, will make a  
14 determination about whether a conflict of  
15 interest exists.

16 The matrix is not being displayed.  
17 And as you can see, we have no recusals at this  
18 time.

19 If we were to have recusals, we would  
20 remind the Board members at the start of each  
21 subcommittee section of debate. However, given  
22 there is no recusals, we will forego that

1 formality.

2 If Board members wish to disclose any  
3 information about their interests, they're  
4 welcome to do so at this time. This is a general  
5 request and voluntary.

6 And no specific statements are  
7 required. Does anyone wish to make a statement?

8 (No audible response.)

9 MR. CHAPMAN: Thank you. Moving on,  
10 I also ask folks to be courteous to their  
11 neighbors, public commenters and to the Board.  
12 Please silence your phones, silence your  
13 computers, and take any conversations outside  
14 into the hallway or the foyer.

15 We have stanchions placed up here.  
16 And we ask the public to refrain from coming  
17 behind the Board as it is distracting to the  
18 Board members listening to testimony or  
19 deliberating on issues.

20 This is not to deter from public  
21 interaction with individual members during the  
22 break. And I encourage that interaction where

1 possible.

2 I remind the public that photography  
3 and the use of other media is allowed at this  
4 public meeting. And I ask for those that use  
5 those devices to be respectful of the Board and  
6 public commenters, and not to be distracting.

7 If individuals become disruptive at  
8 this meeting, they will be warned. If the  
9 disruptions continue, those individuals will be  
10 asked to leave.

11 I do plan on running a tight ship with  
12 a little bit of humor now and then. And my only  
13 ask is that you laugh at all my jokes.

14 (Laughter.)

15 MR. CHAPMAN: Yes. It worked this  
16 time. Because the last time I did that, and no  
17 one laughed.

18 (Laughter.)

19 MR. CHAPMAN: In fact I had already  
20 written something in here about man, no one  
21 laughed at that this time. All right. Very  
22 good. People learn.

1 All right. A few announcements of  
2 activities surrounding us. First of all, if you  
3 haven't realized, today is Halloween.

4 So if you brought your children with  
5 you, and perhaps a spouse or other responsible  
6 guardian, there's a downtown trick or treat event  
7 from 11:00 to 2:00 p.m. today.

8 And I know most folks will want to  
9 stay in this room for whatever ghostly haunts are  
10 in store for us on our agenda. But as a father  
11 of young children, I wanted to throw that out  
12 there for all the parents that are in the  
13 audience.

14 Also today during lunch, some members  
15 of the Keep Soil in Organic movement, will be  
16 holding a rally offsite. They will be meeting,  
17 as I understand, in the parking lot during lunch  
18 to walk over to their event location. Which is,  
19 I think, about a five minute walk.

20 More information -- I believe more  
21 information about that is available outside. And  
22 if you're interested in that, I encourage you to

1 find Dave Chapman.

2 Lastly, QCS is generously hosting a  
3 reception at the Intuition Brewery tomorrow night  
4 after the meeting. I can think of no better  
5 motivation to get done on time than beer.

6 That's it for me. I think we're ready  
7 for a break. And then after that we'll start  
8 back with our expert panel on imports.

9 Thank you everybody. We're in recess  
10 until 10:30.

11 (Whereupon, the above-entitled matter  
12 went off the record at 10:09 a.m. and  
13 resumed at 10:40 a.m.)

14 MR. CHAPMAN: All right, we're going  
15 to get started here. Thank you, everyone, for  
16 getting quiet and finding your seats. We're  
17 going to start back up with our panel of experts  
18 on federal agencies and imports, and I'm going to  
19 hand it over to Dr. Paul Lewis for an  
20 introduction.

21 DR. LEWIS: Thank you, Tom, and thank  
22 you to the members of the Board. Last August,

1 the National Organic Program provided a charge or  
2 work agenda to the National Organic Standards  
3 Board on improving oversight of imported organic  
4 products. The Agricultural Marketing Service  
5 National Organic Program, as background,  
6 determined that certain shipments of corn and soy  
7 shipped from Turkey were fraudulently labeled as  
8 organic.

9 As Dr. Tucker spoke about earlier this  
10 morning, AMSNOP has taken steps to deter  
11 additional fraudulent shipments and to protect  
12 the integrity of the organic system. As part of  
13 that work agenda item from last August, the NOP  
14 requests that the National Organic Standards  
15 Board provide recommendations on improving the  
16 oversight and control procedures used by AMSNOP  
17 certifiers and operations to verify organic  
18 claims for imported organic products. Today's  
19 panel is really the beginning of an opportunity  
20 of a dialogue for federal perspectives on the  
21 import of organic products.

22 We're excited, this morning, to bring

1 together several players from the federal  
2 community to provide a background for the Board,  
3 as part of its beginning work dealing with this  
4 important issue, in terms of maintaining the  
5 integrity of imported organic commodities.

6 We have four panel members this  
7 morning. I want to introduce them to you. First  
8 is Michael Durando, who is from the USDA's  
9 Agricultural Marketing Service Marketing Order  
10 and Agreement Division. Mr. Durando will open  
11 the panel discussion, providing an overview from  
12 a federal perspective.

13 Michael serves USDA's director of the  
14 Marketing Order and Agreement Division in this  
15 capacity. He oversees the administration of  
16 numerous regulatory programs, including federal  
17 marketing orders for fruits, vegetables, and  
18 specialty crops and related programs. Second, we  
19 have Mr. Daniel Collier, from the Department of  
20 Homeland Security Customs and Border Protection.  
21 Mr. Collier is an international trade specialist  
22 in the Office of Trade. His focus is on

1 interacting with other U.S. government agencies  
2 to effectively carry out various public health,  
3 safety, and trade enforcement missions.

4 Previously, he served as a  
5 presidential management fellow at the Department  
6 of Homeland Security. Third, we have Mr. Matthew  
7 Farmer, from USDA's Animal and Plant Health  
8 Inspection Service, the Plant Protection and  
9 Quarantine Program. Mr. Farmer is the assistant  
10 director in that office for the Quarantine Policy  
11 Analysis and Support Division. He has previous  
12 experience with the Department of Homeland  
13 Security Customs and Border Protection.

14 He also worked at U.S. Forest Service,  
15 Department of Justice, and he's a graduate of the  
16 State University of New York College of  
17 Environmental Science and Forestry in Syracuse,  
18 where he earned dual degrees in biology and  
19 natural resource management. The first three  
20 panelists will really help set the stage, in  
21 terms of what's happening, really, in the broader  
22 federal community. Then finally, Dr. Jenny

1 Tucker, as you all know, is the associate  
2 administrator of the USDA Agricultural Marketing  
3 Service with the National Organic Program, really  
4 helps set the stage in terms of what the charge  
5 is for the Board and to help set the stage in  
6 terms of opening the questions and a dialogue in  
7 this area. I'd like to first turn to Mr.  
8 Durando.

9 MR. CHAPMAN: Just for the Board,  
10 we're going to run through the four  
11 presentations, and then open it up to question  
12 and answer after.

13 MR. DURANDO: Good morning, everybody.  
14 Let's get the slides adjusted here. Paul, thank  
15 you very much for that introduction. Good  
16 morning, Mr. Chairman. Good morning, members of  
17 the National Organic Standards Board. Good  
18 morning, members of the audience.

19 I want to thank our good colleagues at  
20 the National Organic Program for the invitation  
21 to be here today and attempt to shed a little bit  
22 of light, begin to build awareness among the

1 members of the Board here, about importation of  
2 agricultural products and their regulation from a  
3 marketing perspective, not from a phytosanitary  
4 perspective, which Matt will certainly be  
5 addressing that in the course of his  
6 presentation. A couple of key points I'd like to  
7 cover today.

8 First of all, pointing out how,  
9 through work with CBP and department wide and  
10 with the system that we have built within the  
11 Marketing Order and Agreement Division, how we  
12 have improved government services through  
13 cross-departmental use of information technology,  
14 and then to leave you with a bit of a sense of  
15 the high degree of complexity of agricultural  
16 import regulations.

17 There are a lot of moving parts. As  
18 soon as one gets into it, you begin to learn that  
19 you didn't know what you didn't know, and you  
20 finally discover new aspects of it each time you  
21 make a step forward.

22 Going to discuss a little bit of what

1 we've done in my division, in terms of regulating  
2 agricultural imports, specific commodities, that  
3 is, and a system we built in our experience with  
4 that and what those outcomes are. Finally, I'll  
5 leave you with some thoughts about my perspective  
6 of what are the critical elements for success for  
7 a program like mine, and perhaps like the  
8 National Organic Program, in terms of moving  
9 forward. What do I think were the key components  
10 that allowed us to be successful within the  
11 Specialty Crops Program area of AMS with the  
12 build and implementation of our system?

13 Jenny Tucker has already thrown out  
14 some acronyms, and we appreciate her spending the  
15 time to walk you through and remind you what all  
16 of these mean. I've put them up here again. I  
17 think repetition is good. You're going to here,  
18 today, ITDS and ACE. They refer to the  
19 International Trade Data System. This is really  
20 the whole project that was worked on for,  
21 actually, several decades.

22 Daniel Collier, from CBP, will be

1 talking a lot more about that. Within ITDS is  
2 the actual system, called the Automated  
3 Commercial Environment. A little bit redundant,  
4 but it's a system that's owned by Customs and  
5 Border Protection. This whole effort began with  
6 an authorization by Congress, in 1993, of a very  
7 specific statute, designed to begin to improve  
8 the efficiency of agricultural importing into  
9 this country -- pardon me, all importing, not  
10 just agricultural -- provides a single  
11 centralized access point for government and the  
12 trade community. They call it the single-window  
13 approach. Fifteen to twenty years to build out.  
14 I guess the most important point of this slide is  
15 47 partner government agencies -- you'll hear us  
16 refer, potentially, to the term PGA or PGAs.

17           That's a partner government agency.  
18 These are all the folks around the federal  
19 government who are working across departments,  
20 and really throughout, to capitalize on this  
21 system and, in essence, improve the integrity of  
22 and, if you will, the Homeland Security of the

1 country. A lot of this is through economic  
2 security or phytosanitary security, in the case  
3 of agricultural products.

4 A lot of advantages to this system.  
5 You've got coordination among 47 agencies, like  
6 we've never had before, streamlined industry  
7 compliance, real-time decision making, and  
8 long-term reduced costs. Definitely, we're  
9 moving out of the paper business. Any of these  
10 systems -- and, indeed, as the National Organic  
11 Program contemplates participating in ACE,  
12 potentially building a system that interacts with  
13 it, it's important to understand there are  
14 partnerships involved, and there's a deliberate  
15 governance system, which is very common in the  
16 information technology community. The ITDS board  
17 of directors, I serve as the representative for  
18 the Agricultural Marketing Service to the ITDS  
19 board. That's comprised of the 47 PGAs.

20 It really oversaw the development and  
21 build of the ACE system, and then continues to  
22 oversee its ongoing development, as it will

1 change over time. There's a second entity  
2 involved in governance, called the Border  
3 Interagency Executive Council, or the BIEC. It  
4 focuses, really, on operations and maintenance,  
5 and then ongoing modernization and enhancements.

6 For those of us who are already in  
7 ACE, with message sets and our executing, if you  
8 will, there is a need, from time to time, to  
9 build improvements or enhancements. Also, if a  
10 regulation changes, sometimes it can be a couple  
11 of words in a regulation, it may mean that one  
12 has to go in, change a message set. That  
13 requires time and investment and overall efforts.  
14 The BIEC, we're in a process right now where it's  
15 really trying to focus on how to prioritize the  
16 needs of 47 agencies and who gets in line first  
17 when changes need to be made. I've talked about  
18 the different departments. Agriculture is one,  
19 but you can just see, in that blue box, how many  
20 other departments around the government are  
21 involved.

22 The importation into this country of

1 goods and services is a very, very complex  
2 effort. It's wrong to ever assume that our  
3 agency, AMS, for example, is the only entity  
4 looking at a shipment coming in. There are  
5 probably, on average, another 10 or 15 agencies  
6 doing their jobs, pretty much out of the  
7 limelight, to ensure that product or that good or  
8 service actually belongs in this country.

9 I'm going to drill down, now, and  
10 focus in. Within USDA, we're one department, and  
11 within that, we have four PGAs, USDA AMS, that's  
12 the agency within which I serve. Animal and  
13 Plant Health Inspection Service is represented by  
14 Matt Farmer today and has a very robust system  
15 they're working on and interacts very closely  
16 with ACE. FSIS is the Food Safety Inspection  
17 Service. They're looking at a lot of meat and  
18 livestock imports. They have a system that  
19 they've built and have been in play now for quite  
20 some time. They are a major player within USDA.  
21 Then lastly, the Foreign Agricultural Service,  
22 which is primarily a data user.

1                   They don't really have control  
2                   capability at the border, but they use the data  
3                   that comes from ACE, really, for statistical  
4                   purposes, reporting purposes, and evaluation of  
5                   foreign countries' activities. Going to drill,  
6                   now, from USDA down into AMS.

7                   We're now into AMS, one of 17 agencies  
8                   within the U.S. Department of Agriculture. There  
9                   are really five different entities within AMS  
10                  that have a stake in the utilization of ACE.  
11                  They are the Marketing Orders and Agreements  
12                  Division, where I reside, and we'll talk more  
13                  about that in a minute, in terms of regulating  
14                  imports of 14 different commodities.

15                  Specialty Crops Inspection actually  
16                  handles the inspection of all of those  
17                  commodities that my division regulates. We have  
18                  a Shell Egg Quality Assessment program that  
19                  monitors the importation of all shell egg and  
20                  shell egg products for very specific health and  
21                  safety purposes. We have two other entities.  
22                  Our Market News Division's throughout AMS, a very

1 robust reporting system of market news, not just  
2 in specialty crops, but in livestock and the  
3 other commodity sectors. They are a data user.

4 Then the Research and Promotion  
5 programs, which, unlike Marketing Orders, don't  
6 necessarily regulate quality and standards and  
7 minimum grade, but they do provide opportunities  
8 for generic research and promotion activities for  
9 domestic industries.

10 They pull a tremendous amount of data  
11 from ACE for purposes of enforcing assessment  
12 collections against imports. You can really  
13 group the five entities into two broad  
14 categories, one the interactive users, which  
15 would be the three on the left, and then the  
16 second is the data users, the two on the right.

17 Data users, they don't need to build  
18 message sets. There is a thing called an ACE  
19 portal. It's a computer window, if you will.  
20 You have to have a clearance to get on. Within  
21 our agencies, those Market News and those  
22 Research and Promotion program personnel are able

1 to log on to that portal and pull the data down  
2 that they need, in the format they need, and then  
3 use it within their systems for compliance  
4 purposes. On the interactive users, that's where  
5 we actually build out a system that interacts and  
6 talks with ACE. We have messages going back and  
7 forth because, as you'll see in a minute, we  
8 actually have a role in deciding whether, in my  
9 division, whether products actually enter this  
10 country or not.

11 What is it that the Marketing Order  
12 and Agreement Division does? It does a lot of  
13 things, but among them, there's what we call  
14 Section 8(e), Import Regulations. Without  
15 getting into the weeds, there's a very specific  
16 statute, the Agricultural Marketing Agreement Act  
17 of 1937, that authorizes these things called  
18 marketing orders.

19 Within that act is a very specific  
20 provision that says whenever a marketing order is  
21 in effect for a specific commodity -- maybe it is  
22 citrus, maybe it is tomatoes, maybe it's table

1 grapes -- then any product imported into the  
2 United States during that marketing period must  
3 meet the same minimum standards -- they can be  
4 quality, grade, size or maturity standards --  
5 that are applied to domestic producers. This  
6 relates to 14 different commodities. In essence,  
7 it says if you want to import these products in,  
8 then you're going to have to have the same  
9 inspection upon entry into the United States as  
10 is required of domestic producers or handlers at  
11 shipping point, before they ship product into the  
12 market within the United States, or even for  
13 export purposes.

14           Going back to, I think Jenny may have  
15 used a grapefruit example, maybe, in one of her  
16 slides, there is a citrus marketing order that  
17 regulates grapefruit. In Florida, grapefruit  
18 must meet certain minimum sizes, grade, quality  
19 standards.

20           During that time period, any  
21 grapefruit coming into the United States from  
22 South America or South Africa or anywhere else

1 around the world, prior to being released at the  
2 border, it must meet those same standards and be  
3 inspected to prove that is the case.

4 Approximately 250,000 to 350,000 entries per year  
5 into the United States just within those 14  
6 commodities that we're talking about that my  
7 division oversees. An entry is any, what we call  
8 a lot. I'm kind of getting into Daniel's area a  
9 bit, but typically has a customs entry number. A  
10 lot can be a shipment of one pallet of product.  
11 A lot could be a shipment of ten shipboard  
12 containers, with maybe 20,000 or 30,000 boxes of  
13 product. It really depends on how the broker  
14 categorizes the load.

15 These are the 14 commodities, to give  
16 you a little bit of perspective as we move  
17 through and into this case study. These are the  
18 14 commodities that my division regulates from an  
19 import standpoint.

20 None of these commodities get into the  
21 United States, either on a year-round basis, or  
22 some of them are on a cyclical seasonal basis,

1 without my division ensuring that they are  
2 inspected by federal or federal state personnel  
3 to meet the same standards that American  
4 producers and American shippers have to meet.

5 A little quick picture of before ACE  
6 and after ACE. I'm going to give Daniel license  
7 to correct me if I go a little bit wrong on this.  
8 I think we have it nailed down. I was trying to  
9 put it in just plain language and what does it  
10 mean for us, in the government, and perhaps for  
11 all of you in business out there. Before ACE,  
12 all importers were basically working with paper.  
13 They had reams of paper that they were filing  
14 with CBP, and really, going way back before,  
15 there would be these dossiers, if you will, of  
16 paper that would travel with loads, either air  
17 freight -- air, land, sea, whatever it would be  
18 -- that would be physically checked at the  
19 border.

20 Ultimately, when a product entered,  
21 there was a requirement that we had internally  
22 called a stamp and fax, where the entity would be

1 notified -- if customs got down to that level in  
2 the weeds, they would remind the importer that  
3 you need to get an inspection by AMS to ensure  
4 that it meets the right minimum standards.

5           Then it was up to that -- before  
6 crossing, that broker to then, in essence, make  
7 contact with our inspection personnel and show  
8 proof of that, that they provided a heads up that  
9 they were coming. This was all with paper and  
10 with faxes and phone calls and everything else.  
11 Then we would conduct an inspection. Then there  
12 were paper inspection certificates that the  
13 shipper or the owner of that product on site  
14 would hang on to. Then probably three or four  
15 copies of this paper document would go different  
16 places, and they would be held in files by our  
17 inspection division, and then ultimately, if we  
18 wanted to reconcile entries with inspections, we  
19 had to somehow obtain, in my division, thousands,  
20 tens of thousands, several hundred thousand paper  
21 inspections and start going through those one by  
22 one and match those up against CBP data.

1           Creates real difficulty trying to  
2           reconcile paper certificates with import data.  
3           This affected timeliness of enforcement. In  
4           essence, if we did not respond to Customs and  
5           Border Protection within 30 days of entry, it was  
6           automatically presumed by CBP that the load met  
7           -- they had to let it go and basically release  
8           the exporter from any further reliability.

9           We relied on a weekly data transfer  
10          from CBP to us via a CD. Literally, a CD with  
11          data on it would be couriered over from CBP to  
12          AMS, or mailed. We would get that. We'd load it  
13          into our system and start building our  
14          spreadsheets and attempt to reconcile. The long  
15          and the short of it is it really affected the  
16          visibility of entries. With all due respect, I'm  
17          not sure CBP's data was as accurate then as it is  
18          today. We'll talk about after ACE. Definitely,  
19          at our end, we did not have good visibility of  
20          every single entry. There's no way we could. We  
21          didn't have the manpower and certainly couldn't  
22          line that up with all of the inspection

1 certificates.

2 After ACE, which actually was, I  
3 guess, built out and in full production, we could  
4 say, by December 2016, things changed  
5 dramatically. The paper went away. Importers  
6 and their brokers were filing electronically,  
7 which, upon filing, would generate automatically  
8 an inspection request to AMS. In other words,  
9 they would go into the single window, as they  
10 call it, and there are all the different datasets  
11 that the importer or the broker would have to  
12 enter.

13 As soon as it was identified as one of  
14 the 14 commodities that we regulate, and it was  
15 during the time of year when it needed to be  
16 regulated, it would generate an automatic signal  
17 to our inspection division, saying heads up,  
18 you've got this inspection coming, and it's going  
19 to be arriving, and it's going to need to be  
20 inspected in Los Angeles or in Phoenix or in  
21 Denver or in Philadelphia or wherever. The  
22 inspection would be conducted, and then that

1 inspection data is electronically transmitted, in  
2 an automated fashion, back to my division, and  
3 ultimately, then, on a very real-time basis,  
4 what's really happening is we're getting  
5 inspection data back on one side -- and you'll  
6 see this in a minute -- and then on the other,  
7 we're getting the full load of data from CBP.

8 The systems are reconciling, and what  
9 we get are the flags, then, of who hasn't  
10 fulfilled their inspection requirement. It's a  
11 real-time inspection system. What's important is  
12 with this new system, there really isn't this  
13 30-day default release by CBP. AMS, through my  
14 division, has what we call hold-intact authority.

15 Daniel can elaborate on the two  
16 different types of authority. Hold-intact  
17 authority means that product is not released,  
18 legally, from custody of CBP, and the exporter is  
19 not released from liability, until we've  
20 determined that it meets. We're one of  
21 potentially up to 47 agencies that may have  
22 something to say about that shipment. With this

1 new system, with ACE, most of our entries are  
2 released within 24 hours. Then very, very  
3 importantly, we have visibility of all entries,  
4 now, for our regulated products. How do we do  
5 this? We do this with something called CEMS, or  
6 the Compliance Enforcement Management System.  
7 Basically, it works this way.

8           Again, I'm presenting this as a case  
9 study because you might be thinking how might  
10 this be applicable to the regulation or the  
11 oversight of organic imports, or those that have  
12 been certified as organic, in ensuring that they  
13 retain that integrity? It starts out here.

14           The importer files in ACE, says I'm  
15 bringing in a load of kumquats or grapefruit or  
16 tomatoes or whatever. Immediately, ACE transmits  
17 data from its window or from its system there  
18 into CEMS. The next thing that happens is CEMS,  
19 as I mentioned, automatically generates an  
20 inspection request to our inspection division.

21           It doesn't go to a centralized  
22 division office. It, on an automated basis,

1 sends a request to, I believe we've got more than  
2 30 or 40 inspection offices around the country.  
3 It automatically decides which office needs to  
4 receive that request, depending on the final  
5 destination of that shipment. The inspection  
6 office then, with the exporter and the shipper,  
7 arranges for the inspection and conducts it, and  
8 the inspection certificate says this load passed.  
9 That data is automatically, then, transmitted  
10 back to CEMS, which then looks at it and says  
11 this is inspected, we no longer have an interest  
12 in it.

13 So automatically, it goes back and it  
14 tells CBP that we release our hold, and it's  
15 cleared to proceed. It doesn't mean that  
16 shipment is cleared to proceed -- that's CBP's  
17 final decision. We're saying from AMS Marketing  
18 Order standpoint, it's cleared. We no longer  
19 have an interest. Obviously, if it doesn't  
20 clear, then CBP doesn't get a signal yet from our  
21 system, and it knows that there's a problem.

22 It's really no questions asked. It

1 will not be cleared until AMS is able to  
2 reconcile that. CEMS development. How do we  
3 build the system? Again, this is important to  
4 think about as the National Organic Program  
5 contemplates how it wants to deal with the import  
6 situation that it has, but it does take time.  
7 For us, it took three years to -- actually, we're  
8 probably about seven or eight years in conceiving  
9 the concept and pushing for the support, and it  
10 wasn't until the ACE build really got traction,  
11 in the last four years of its build, but it took  
12 us three years, pretty much start to finish, to  
13 build out our system, and about \$3 million, so it  
14 takes money. The resources included our own  
15 information technology service.

16 That's our own in-house IT shop of  
17 developers and other folks who really work with  
18 the contractor's. We had a team of contractors  
19 that we retained, as is very common in most IT  
20 projects, to build out the system. You've heard  
21 the term message sets. We built nine different  
22 message sets that are interactive with CBP for

1 the different commodities.

2           Some of you might be asking wait a  
3 minute; you have 14 commodities. Some of the  
4 commodities -- more than one commodity can fit  
5 into a message set, without going any further  
6 into that, so don't let those numbers throw you.  
7 What were the results? The results are  
8 important. We increased our visibility of  
9 entries from about 500 lots per week to 5,000  
10 entries per week. That's a ten-fold increase.  
11 This is very significant for us. The compliance  
12 case investigation and average closing time was  
13 reduced from about three months, on average,  
14 under the before ACE situation, to down to three  
15 weeks, on an average, for after ACE and once we  
16 built out CEMS. Some of these cases, we have to  
17 track them for a while if they have to be  
18 re-exported.

19           We also have provisions in our  
20 regulations that allow, rather than re-exporting,  
21 they can either destroy the product, they can  
22 ship it to food banks. They can also put it to

1 other non-competitive uses. For example, they  
2 can send it to a processor or those types of  
3 things. We're still piloting our system, and  
4 there's some regulatory reasons for that.

5 We haven't finalized a particular  
6 rulemaking yet. It will happen. With probably  
7 about 5 percent or so, maybe 5 to 10 percent of  
8 our imports coming in under our pilot program  
9 right now, we've opened and closed 1,200  
10 compliance cases just since July 2017. You can  
11 see it's a very robust system, with strong  
12 capability. It gives us, finally, full  
13 enforcement capability for our Section 8(e)  
14 important regulations. We had the responsibility  
15 before, but the technology just wasn't there.  
16 You couldn't afford the hundreds of additional  
17 employees to try to do that on a manual basis.  
18 Very importantly, it leveled the playing field  
19 for American producers. An imported product  
20 cannot compete unfairly with them on an economic  
21 standpoint.

22 Then lastly, and certainly very, very

1       importantly, assured quality for American  
2       consumers. They were not subjected to  
3       potentially substandard product coming into the  
4       country at a time when they're demanding and  
5       wanting a consistently high and standard product  
6       quality of a commodity. Critical elements for  
7       success.

8                 No. 1, you need the legal authority --  
9       in our case, the legal authority to regulate  
10      imports and hold them to a standard and have the  
11      ability to enforce compliance on that product.  
12      Secondly, a clear process of that authority  
13      that's supported by regulations which is clearly  
14      spelled out. In our regs, where we actually  
15      clearly define that entry in the United States is  
16      considered to be -- or defined as release from  
17      custody of Customs and Border Protection. You  
18      need the funding for system development,  
19      operations, and maintenance, the staff resources  
20      for compliance enforcement. Actually, with our  
21      new system, one would think you're going to  
22      streamline; you don't need as many people.

1           We're actually going to have to add a  
2 number of additional people because of the  
3 compliance caseload, but the benefit to the  
4 Department, the industries, and the American  
5 people is we're actually enforcing compliance of  
6 these regulations.

7           Then last but not least, a lot of  
8 communication and outreach to stakeholders.  
9 We've had to partner with major brokers at  
10 various ports of entry to develop, test, and  
11 pilot our system. You need to have a  
12 constructive working relationship with them, not  
13 an adversarial relationship. With that, I say  
14 thank you. We'll remain available for questions  
15 and look forward to the other panelists'  
16 contributions. Paul, thank you.

17           DR. LEWIS: Thank you, Michael. Let's  
18 give it a moment for Michelle to pull up Daniel's  
19 slides. Again, Daniel Collier, from DHS. Again,  
20 this is part of getting the broader federal  
21 perspective Michael spoke about, in terms of  
22 interacting with the federal partners. Daniel

1 will be adding to that and focusing more in terms  
2 of his role with the Department of Homeland  
3 Security.

4 MR. COLLIER: Thank you very much. Is  
5 this good volume? I want to make sure I'm not  
6 leaning in too far into the mic. Thanks, again,  
7 very much, Mike. That was an excellent  
8 presentation. I kept thinking, during his  
9 presentation, that there were things that I  
10 wanted to talk more about because he touches on  
11 things that I want to talk about. Hopefully,  
12 there won't be too much overlap between what I  
13 discuss and what he discussed.

14 I'm going to try to provide more of a  
15 broader picture of what we call the single-window  
16 project implementation that included the  
17 agricultural marketing service, USDA, as a whole,  
18 and dozens of other agencies that interact with  
19 ACE in a variety of ways, which Mike touched on,  
20 the data user role versus the data -- I'm sorry,  
21 the data user role and the enforcement role that  
22 other agencies have upon entry in the United

1 States. There's a wide variety of that  
2 throughout the federal government. Just to get  
3 started and provide a general overview of ITDS,  
4 which is, as Mike mentioned, the International  
5 Trade Data System, which is the large project  
6 into which the development of the Automated  
7 Commercial Environment, ACE, falls into.

8 ACE has been around for quite a while,  
9 and it is the successor to our legacy system, the  
10 Automated Commercial System, ACS, which, as ACE  
11 has been developed, we have been phasing out ACS.  
12 That transition is not yet complete, so ACS still  
13 exists in the background, behind ACE, but ACE is  
14 the public facing system that both the federal  
15 agencies rely on and our partner government  
16 agencies, the PGAs, rely on, and what the trade  
17 community uses, our brokers, importers, etc., to  
18 file data, file entry information, manifest  
19 information, entry summary information into ACE,  
20 and then we, as the government, process it on our  
21 end.

22 The timeline that we have worked with

1 for the past couple years officially ended in  
2 December of 2016, last year, which was the  
3 implementation of the core ACE functionality,  
4 which involves the essential functions that each  
5 of our 47 partner government agencies undertake  
6 for their various trade enforcement missions.  
7 That deadline was set by the previous  
8 administration, via executive order, which was  
9 issued in February of 2014, or maybe that was  
10 2012, excuse me. Now we're in what we call the  
11 post-core environment.

12 We are working with our federal  
13 partners, our trade community partners, and  
14 within our own agency to prioritize enhancements  
15 to the system, based on requests from the trade  
16 community, based on regulatory needs by other  
17 agencies, under which any future organic product  
18 work would fall into would be this what we call  
19 post-core. We've completed Core A.

20 It undertakes the essential trade  
21 functions that we have been provided and we have  
22 implemented. But there's a lot of, not only

1 operations and maintenance work to be done in  
2 this post-2016, but there's also a lot of, what  
3 we call enhancements to be made to the system  
4 that are on behalf of our various stakeholders  
5 and partners. As Mike alluded to earlier,  
6 various federal agencies have, obviously, their  
7 own requirements for admissibility of imported  
8 goods into the country, whether that be  
9 agricultural requirements or requirements on  
10 behalf of the Environmental Protection Agency for  
11 ozone-depleting substances or pesticides or  
12 various vehicle engine requirements.

13           There's also the National Highway  
14 Traffic Safety Administration, NHTSA, which falls  
15 under the Department of Transportation, which has  
16 its own motor vehicle requirements for entry into  
17 the U.S. We also work with the Food and Drug  
18 Administration and the Center for Disease Control  
19 and Prevention.

20           Both of those agencies, which fall  
21 under the Department of Health and Human  
22 Services, have their own various requirements,

1 depending on the law that they're enforcing.

2 Each of these agencies have personnel that their  
3 own personal accounts in ACE to access the system  
4 that is used now across the federal government.

5 We're now all working from the same  
6 system and are reviewing shipments, either  
7 through automated checks that are put in the  
8 system on behalf of each agency, or there's often  
9 manual review of forms that have not been  
10 automated, but actually scanned into the system  
11 as part of our document image system, which is a  
12 functionality available in ACE, where someone  
13 from CDC, for example, could go in and look,  
14 check out a form, try to make a determination of  
15 whether it's authentic.

16 If not, go back to the broker and  
17 request additional information, or they can reach  
18 out, they can contact CDP, either at the  
19 headquarters level, through the system, or can  
20 actually contact other agencies, as well, within  
21 the system, if they see something amiss, they  
22 want to have another agency take a second look at

1 something.

2 As I mentioned earlier, each agency  
3 has had its own forms, which then we have  
4 translated into each agency's own unique PGA  
5 message set. When we talk about PGA message set,  
6 each one is unique to each agency.

7 AMS has multiple message sets for its  
8 various requirements. Other agencies each have  
9 their own, as well. Those represent data  
10 elements that have been taken from forms that  
11 they've -- each agency used to require upon  
12 entry, that are now being submitted into a system  
13 that can now be analyzed and reviewed in a way  
14 that wasn't possible prior to the implementation  
15 of ACE. We've learned several things throughout  
16 this process that I will cover briefly here, the  
17 first of which is the will that's needed from a  
18 very high level of leadership in government to  
19 actually see this huge project through, to get  
20 close to 50 agencies together working toward a  
21 common goal.

22 That really accelerated with the

1 executive order that I mentioned earlier. As you  
2 can see here, the programming for ACE actually  
3 began in the early 2000s and has been an ongoing  
4 process for completion, which officially occurred  
5 at the end of last year.

6 In addition to political will and sort  
7 of a consensus among various federal agencies  
8 that we all have a common interest in pursuing  
9 the implementation and continual development of a  
10 single system, during that process, we've had to  
11 map out what each agency's legal authorities are  
12 and to make sure that legal authority, then,  
13 translates into what actually can be done by each  
14 agency in the system, so that data isn't be  
15 shared in a way that's not legal, to ensure that  
16 an agency that is able to -- has, actually, what  
17 we call border hold authority, is able to place  
18 holds on a shipment, either through CBP -- some  
19 agencies can request that CBP place a hold on  
20 their behalf. A select few are able to place  
21 holds on their own.

22 Other agencies, while they have --

1 technically, they have regulations that prevent  
2 goods from coming into the country, unless they  
3 meet certain requirements, don't necessarily have  
4 the explicit authority to place holds, or the  
5 personnel at the border to do so.

6 Not only are there varying legal  
7 authorities, but there's also the resource  
8 constraints that allow some agencies to have  
9 individuals working side by side with my APHIS  
10 colleagues and FDA colleagues and U.S. Fish and  
11 Wildlife Service at the ports of entry.

12 Other agencies don't have that sort of  
13 manpower, and thus rely heavily on us to do  
14 things on their behalf, or they are looking at  
15 things using their various ACE accounts, and then  
16 pursuing various things once they are released  
17 into U.S. commerce in various ways. This is just  
18 to say that the legal aspect for each agency has  
19 played a critical role in carving out each  
20 agency's role in ACE. As I mentioned, and this  
21 still continues to today, this project has had  
22 oversight in the highest levels of the U.S.

1 government.

2 So not only does monitoring occur at  
3 that level, but the heads of the agencies often  
4 meet frequently to discuss the progress of ACE,  
5 the extent to which various agencies are  
6 participating, areas where there may need to be  
7 improvement or additional attention is needed.

8 When talking about major enhancements,  
9 when talking about funding, as Mike mentioned  
10 earlier, the governance board structure that has  
11 been in existence throughout the development of  
12 ACE is still in place now, as we continue to work  
13 to reach consensus on a variety of issues.

14 That includes changes that need to be  
15 made in the system as a result of regulatory  
16 changes, whether that's statutory laws passed by  
17 Congress, or whether that's a regulatory change  
18 that an agency makes based on pre-existing  
19 statutory authority. We continue to prioritize  
20 the changes that are needed based on those  
21 requirements, and then from there, once that  
22 prioritization takes place, the resources have to

1 be allocated for development work, whether that's  
2 for major projects, or whether that's for  
3 tweaking a few things in the system, which we --  
4 it's a term that's used as IT best practice,  
5 operations and maintenance. That leads into the  
6 stakeholder engagement. We work with several  
7 bodies within the trade community.

8 That includes our own federal advisory  
9 committee, Customs and Border Protection, used  
10 for all of our various trade-related missions,  
11 but also through the BIEC, the Border Interagency  
12 Executive Council, as its own external engagement  
13 committee, which is made up of members of the  
14 government and the trade community.

15 That gives them a regular chance to  
16 voice any concerns they have about using this  
17 system to make suggestions, and it gives us a  
18 chance to keep them apprised of any changes,  
19 system outages in ACE and things like that, so  
20 that we're continuing to try to stay on the same  
21 page, as the system continues to evolve. This  
22 just provides a recent timeline that includes the

1 December 2016 deadline and some various  
2 functionality deployments in the system that have  
3 occurred since then. In the system, as I  
4 mentioned before -- and I won't repeat much of  
5 what I said here, but each agency that obtained  
6 ACE accounts and merged into this system, each  
7 did its own, what we term pilot, which is just  
8 sort of a test of their own functionality in ACE.

9 For each one, once all of the IT  
10 development work was done in a testing  
11 environment, we worked with members of the trade  
12 community, which would have to file the data that  
13 is required by each agency, and conducted a pilot  
14 that was on a voluntary basis. We worked with  
15 the trade community on a pretty -- a close  
16 working relationship to test the submission of  
17 the PGA message set for each agency prior to what  
18 we call mandatory implementation of that message  
19 set.

20 That pilot process serves as a best  
21 practice for going forward for creation of future  
22 functionality. Just to reiterate some of the key

1 benefits for the other agencies -- and this  
2 speaks to what Mike was mentioning earlier about  
3 the savings of time and resources, the increased  
4 visibility of data, since we're all looking at  
5 the same system, the cross-communication among  
6 agencies within ACE, and the elimination of  
7 paper. Through this process, we've eliminated  
8 hundreds of forms, due to the translation of the  
9 data into message set data, which is filed for  
10 those entries that a given agency requires. This  
11 is just a quick overview of various benefits, not  
12 just for the government side, but for all those  
13 participating in the process.

14 Just some key lessons learned that we,  
15 I think, definitely, at CBP, but as probably a  
16 government, as a whole, is to, at the very  
17 beginning, really go through the process of  
18 figuring out what our end goal looks like at a  
19 pretty specific level, so that we all know what  
20 exactly we're working toward and to, throughout  
21 the process, continue to evaluate readiness,  
22 continue to look for problems that may exist,

1 identify them quickly, and to ensure that we're  
2 each -- not only within the government, but also  
3 the trade community, we're all working at  
4 relatively the same pace.

5           Once the deadline comes around, we're  
6 all at a point where we can then go make this a  
7 mandatory process, and we're all comfortable  
8 doing it. Then at the end, once it's done,  
9 looking back to try to see where things went  
10 right, see where things went wrong, look at what  
11 has to be done going forward. This just gives  
12 some information about how to access our website  
13 and find out additional information about ACE.

14           That also includes information about  
15 our oversight bodies, the other agencies we work  
16 with, subscriptions to various messaging services  
17 that we provide that send automatic notifications  
18 to those on the list for a wide variety of  
19 issues. That's it for me. Thank you.

20           DR. LEWIS: Thank you, Daniel. I'd  
21 like to now shift gears and turn to our colleague  
22 from the Animal and Plant Health Inspection

1 Service. As Jenny mentioned before, we have  
2 developed a memorandum of understanding between  
3 our office and Animal and Plant Health Inspection  
4 Service. With that, we're pleased to have  
5 Matthew Farmer talk about his work in this area  
6 from his respective organization.

7 MR. FARMER: That was an interesting  
8 way to start. Thank you to the Board and to NOP  
9 for inviting me to come speak to you today. My  
10 name is Matthew Farmer, and no, it's not a cover  
11 name for USDA that they just assign people that  
12 have to come to meetings. I work in Riverdale,  
13 Maryland, out of our D.C. office. I have a few  
14 topics we'd like to cover today, look at the  
15 APHIS mission and our safeguarding continuum  
16 model, some market access and regulatory process,  
17 also the inspection process, some initiatives we  
18 have going on in APHIS, and some resources.

19 Again, this USDA org chart, which was  
20 taken from the website on Saturday, absolutely,  
21 there will be changes. There has been changes to  
22 it already. If you look down in the lower

1 right-hand side, you see the undersecretary for  
2 marketing and regulatory programs, and you'll see  
3 AMS. Right below that, you'll see APHIS, or the  
4 Animal and Plant Health Inspection Service.

5           You'll also see GIPSA, or the grain  
6 and packers. I believe they're getting moved  
7 under AMS in the future. That's why that org  
8 chart's going to change. As you can see, it's a  
9 very robust org chart. We'll go into the APHIS  
10 mission. The Animal and Plant Health Inspection  
11 Service is a multi-faceted agency with a broad  
12 mission area that includes protecting and  
13 promoting U.S. agriculture health, regulating  
14 genetically engineered organisms, administering  
15 the Animal Welfare Act, and carrying out wildlife  
16 damage management activities. These efforts  
17 support the overall mission of USDA, which is to  
18 protect and promote food, agriculture, natural  
19 resources, and related issues. Specifically,  
20 within APHIS we cover the animal, plant -- the  
21 Plant Protection Act of 2000 and the Animal  
22 Protection Act of 2001.

1                   Those are promulgated in 7 CFR for the  
2 plant side and 9 CFR for the animal side. We  
3 also do work with Fish and Wildlife on some 50  
4 CFR issues. There's the breakdown of what APHIS  
5 looks like, animal care, BRS, or the Bio  
6 Regulatory Service, international service, plant  
7 protection and quarantine is where I reside,  
8 veterinary service and wildlife service. I  
9 mentioned the safeguarding continuum.

10                   It's more of a safeguarding model.  
11 Another way to think about it is the layers of  
12 protection APHIS employs to keep invasive plant  
13 pests and animal disease out of the United  
14 States. We begin at the top of the circle.  
15 There's the offshore programs. Again, there's no  
16 better way to keep dangerous or invasive pests  
17 out than to stop them in the countries where  
18 they're at. We move on to the permitting, which  
19 a permit basically advises an importer what the  
20 requirements are to bring something into the  
21 United States, what our APHIS requirements are.  
22 It spells those out. The purple box is the

1 border and port inspection. That's the box that  
2 I write policy for.

3 To explain that, the events of  
4 September 11, 2001 created the Department of  
5 Homeland Security Customs and Border  
6 Protection. During that, in March 1, 2003, the  
7 plant protection and quarantine officers at our  
8 ports of entry were transferred -- 2,300  
9 inspectors were transferred from USDA to the  
10 newly created department, where they reside  
11 today.

12 The way that we fund those inspections  
13 at our ports of entry is through APHIS user fees.  
14 Those are collected monies to pay for the  
15 inspections of the importations. I'll move on  
16 quickly. We also do have a pest identification  
17 service, and we work with the Smithsonian, but we  
18 do have identifiers located throughout the  
19 country. We have a Smuggling Interdiction and  
20 Trade Compliance group. That's the SITC box. We  
21 also have new pest detection and response. What  
22 that is, that's our surveillance network here in

1 the U.S. We survey for various pests. The last  
2 one is our pest eradication and management. Let  
3 me make this point. APHIS is an emergency  
4 agency.

5 That means 24/7, we have to respond to  
6 outbreaks, whether it be a fruit fly outbreak in  
7 Florida, which has seen a few of those, likewise  
8 in California, any of our citrus producing --  
9 citrus greening, which is currently marching  
10 westward toward California.

11 These are some of the invasive pests  
12 that have made it in. Moving along, so that we  
13 can definitely get some questions in. The market  
14 access and regulatory approval process. I  
15 outlined the steps. I'll go through them pretty  
16 quickly, but I will be here for the questions  
17 from the panel, but also from the audience.

18 Afterwards, I will be available for  
19 any questions regarding any of this. There's the  
20 pre-petition planning, which is does the U.S.  
21 have a market for or that consumers would  
22 produce. Some of those questions are asked.

1       Going through the process, we have the petition  
2       process, where we have to be engaged by the  
3       national plant protection organization of another  
4       country to gain market access for that commodity.  
5       They have to request of the United States,  
6       specifically APHIS, to enter a commodity to the  
7       United States. In turn, we work with them. They  
8       would provide a host pest list.

9                 We would review that through our  
10       Center for Plant Health, Science, and Technology,  
11       out of Raleigh. They would work through and  
12       perform a pest risk analysis. Out of that, there  
13       may be mitigations to allow the entry of that  
14       commodity to come into the United States, whether  
15       that's in the operational work plan, whether it's  
16       a systems approach or IPM, or integrated pest  
17       management, or some other mitigation, such as  
18       chemical treatment or, for mangoes out of Brazil,  
19       hot water dipping or irradiation.

20                Again, I'm going to cover this really  
21       quickly because I know you did not come here to  
22       talk about rulemaking. But I did want to explain

1 an interesting thing that happened in 2007. The  
2 standard process of rulemaking takes several  
3 years. We moved to the notice based, which  
4 streamlines it, shortens the time frame, but  
5 there are some requirements. Those requirements,  
6 the commodity would have to be subject to  
7 inspection, has to come from a designated  
8 pest-free area. There would be some  
9 phytosanitary requirements, and it's for  
10 commercial entry only. I did put up there, if  
11 you want to look, it's 319.56-4 for the full  
12 criteria.

13 The steps after regulatory approval is  
14 how we operationally figure that out for entry.  
15 Those, we have manuals that Customs and Border  
16 Protection agriculture specialists use at our  
17 ports of entry. Again, we have to define those  
18 conditions for entry in our permit and,  
19 ultimately, an operational work plan with the  
20 country of origin.

21 Additionally, we do have to inform  
22 customs of that, of the requirements, so that --

1 there may be cutting requirements and other  
2 operational concerns that customs would have.  
3 The key there is it also lends us to opening up a  
4 pre-clearance plan if the country so chooses to  
5 have that done offshore. I did put this up  
6 there. This is one of the steps is our  
7 phytosanitary treatment. It's our operational  
8 guide for selecting and conducting quarantine  
9 treatments. The procedures and treatment  
10 schedules in this manual, they're  
11 administratively authorized for APHIS to prevent  
12 the movement of agriculture pests into or within  
13 the United States. Listed treatments include  
14 chemical treatments, such as fumigation with  
15 methyl bromide, and non-chemical treatments with  
16 heat, cold, or irradiation.

17           Quickly, I put up the agriculture  
18 quarantine process. I believe it was covered  
19 earlier by Dr. Tucker. The key question is can  
20 this commodity come in? You're an importer, and  
21 you want to bring this commodity in. There's  
22 steps that you can go to. One of them is

1 obtaining a broker. The broker understands the  
2 entry process and how to look that up.

3 But you can also go to the APHIS  
4 website. There's the fruit and vegetable import  
5 requirements, or FAVIR. I'll have a link to that  
6 later on, in one or two more slides. There's  
7 certain entry requirements for a commodity,  
8 notice of arrival, import permit. It may or may  
9 not have a phytosanitary certificate requirement.  
10 There's keys. The inspection of a commodity was  
11 covered. A pest is found. There's only certain  
12 things that can happen to that shipment. I did  
13 want to clarify this. If there is a pest that is  
14 not known to occur in the United States, and it's  
15 deemed invasive, we only have three options. You  
16 can ultimately destroy the shipment. The other  
17 option would be if there is a treatment available  
18 out of the treatment manual.

19 The third option is to re-export to  
20 the country of origin. I will add that CBP ag  
21 specialists -- this is kind of a neat fact --  
22 submit, yearly, over 50,000 pests on imported

1 commodities. That ranges up to 90,000. Year to  
2 year, it's just an amazing amount of work that  
3 CBP does on APHIS's behalf. I wanted to put this  
4 picture up there. This is, again, the CBP ag  
5 specialist.

6 This is out of the Miami port of  
7 entry, air cargo. This was close -- it was in  
8 between Mother's Day and Valentine's Day, the two  
9 biggest days that they receive shipments, but  
10 amazing amount of shipments that they receive.  
11 They're actively looking for pests on the  
12 flowers. Some ongoing initiatives in the future.  
13 Again, I won't belabor the point, but the ACE  
14 ITDS. We're working internally, within APHIS,  
15 for animal care, BRS, PPQ, and VS. We're also  
16 looking forward. We've implemented, for our  
17 Quarantine 37, or propagative material that's  
18 imported, the risk-based sampling at our plant  
19 inspection stations. That's been a resounding  
20 success.

21 We're looking at implementation of  
22 risk-based sampling in the Quarantine 56, which

1 is fruits and vegetables. In the coming years,  
2 we will have that availability. That's similar  
3 to what FDA employs currently and what the  
4 Australians are employing. We will look at  
5 streamlining our permits. We're currently  
6 building a system that's in development to also  
7 engage ACE. That's our e-file.

8 That's being worked on. Additionally,  
9 that's not up there, we're working on  
10 government-to-government certifications. That's  
11 for our phytosanitary and sanitary certificates.  
12 That's government-to-government validation and  
13 verification of the permit for entry. That will  
14 be a big help to speeding and facilitating trade.  
15 I mentioned some resources. A great one is the  
16 APHIS Stakeholder Registry. There's the link for  
17 that. You can go to APHIS's home page. There's  
18 a very prominent Stakeholder Registry notice that  
19 you can click on. But I also mentioned the fruit  
20 and vegetable import requirement. You can go to  
21 that and click on any of APHIS's manuals and take  
22 a look at the entry requirements.

1                   Additionally, if you have some more  
2                   questions and you don't get in touch with me  
3                   today, you can reach our customer service call  
4                   center that's listed up there. Again, that's a  
5                   summary of what we covered. At that point, I'll  
6                   turn it over to Dr. Tucker. Thank you very much.

7                   DR. LEWIS: Thank you, Matthew. We  
8                   just heard, leading from Michael's presentation,  
9                   what's happening with our other federal partners  
10                  Matthew mentioned, in terms of Animal and Plant  
11                  Health Inspection Service, and Daniel, Custom and  
12                  Border Protection.

13                  We're now going to bring this back, in  
14                  terms of what's happening more from an AMS,  
15                  specifically from a National Organic Programs  
16                  perspective. Dr. Tucker will be sharing that,  
17                  bringing us to what's happening with NOP. Then  
18                  secondly, providing more clarity and refinement  
19                  in terms of what we're actually asking the Board  
20                  to do, in terms of looking at imports in the  
21                  organic sector. Let me just also mention to the  
22                  public that the slides that you're seeing today

1 will be posted and available on the NOP website.  
2 I know Matthew and Daniel gave some resources, so  
3 they'll be available for the public to look at  
4 that. Let me now turn to my colleague, Dr.  
5 Jennifer Tucker, providing an NOP perspective.  
6 Thank you.

7 DR. TUCKER: I think we're still  
8 looking for my slides. I have only three, so if  
9 you can't find them quickly, I can talk about  
10 what's on them. They're in the P drive, NOSB  
11 meeting, Jacksonville. There's a subfolder  
12 called Imports Panel. It's in there. I'm going  
13 to go ahead and get started. You've learned a  
14 lot about AMS, APHIS, and CBP, and their  
15 respective roles.

16 They are truly partners in organic  
17 integrity with us, and that's going to do nothing  
18 but increase as we move ahead. An awful lot of  
19 our work in responding to the OIG recommendations  
20 that you heard about earlier are going to hinge  
21 on all the work that you just learned about here,  
22 so I thought it was important to really

1 understand the landscape that we are working in.  
2 We are one of 47 federal partners here, and each  
3 of those have lots of different programs in them.  
4 The complexity of this is really quite  
5 significant, so very much appreciate Matt,  
6 Daniel, and Mike for joining us to talk through  
7 all that, so thanks so much.

8 I'm going to close with three topics  
9 -- there we are -- a quick review of our work in  
10 NOP, a look at what we're doing next, and some  
11 specific requests we'd like the Board to  
12 consider. First, our current work. In the NOP  
13 update, I noted that we are continuing to  
14 emphasize data quality and content, so quality  
15 and quantity, through INTEGRITY. We are  
16 continuing to develop our accreditation system  
17 and expanding our work into international  
18 systems.

19 For example, export certificates. You  
20 just heard a lot about import certificates.  
21 We're also working with export certificates. In  
22 the last couple of months, we were able to invest

1 and begin some development work in creating  
2 electronic export certificates for U.S.  
3 producers, using an existing AMS system called  
4 ETDE. It's electronic trade document something,  
5 but it has to do with electronic documents in the  
6 system. We call it ETDE. We are starting with  
7 populating an electronic certificate for U.S.  
8 operations exporting to Mexico, and then we'll  
9 turn to developing an export certificate to the  
10 EU. For those who work in that area, the system  
11 will connect with TRACES.

12 As part of this, we are working to  
13 reduce burden and errors, by using certifier and  
14 operation contact information from INTEGRITY to  
15 pre-populate certificates. Now that we have the  
16 investment of INTEGRITY -- again, we finished  
17 development on that -- we already have a very  
18 stable baseline of operation data, that can then  
19 be pushed out to other systems, as needed, which  
20 would save a lot of data entry for certifiers, as  
21 they're working with these systems, so as they  
22 feed into other systems.

1           As I mentioned in the NOP update, we  
2           have several actions involving technology that  
3           are going to respond to OIG audit report  
4           recommendations. One of these is the very  
5           detailed process of building these proposed  
6           message sets to send to CBP. Again, we're one of  
7           many programs that want to be able to have  
8           message sets in CBP. They, again, are what will  
9           allow ACE to generate that organic import  
10          certificate. The goal is to first learn how ACE  
11          will generate and accept import certificates  
12          under our equivalency agreements.

13                 In the future, once we learn how to do  
14          that, that import certificate capability could be  
15          expanded to cover imports from international  
16          organic businesses outside existing trade  
17          agreements. All of this work would rely on  
18          having specific regulatory authorities. That  
19          kept on coming up in Daniel's presentation. You  
20          must have regulatory authority. That's always  
21          the first bullet.

22                         Understanding how our regulations fit

1 within that universe is a very, very important  
2 first step. We'll get input from CBP on how that  
3 could unfold. As Mike mentioned, we have been  
4 able to start the message sets already. Again,  
5 the export certificates we're working on is  
6 already funded. Lots of OIG audit  
7 recommendations that relate to this area, so  
8 first steps of many, many to come. For upcoming  
9 work, we're starting to explore the development  
10 and implementation of an international supply  
11 chain traceability system using what is called  
12 Blockchain or similar technologies. These  
13 technologies could allow certifiers to approve  
14 transactions along an organic supply chain, in  
15 real time, enabling them to detect falsification  
16 of documentation and to trace inventory counts  
17 across the supply chain.

18 This type of system could also allow  
19 the NOP to audit across a supply chain, really  
20 fulfilling the goal of tracing product from farm  
21 to market and back again. Again -- I said the  
22 term already -- we're learning a lot about

1 Blockchain. It's both a governance and a  
2 technology framework that can be used to create  
3 electronic networks to connect players and  
4 products through transactions along a supply  
5 chain.

6 For example, a farmer could, say, use  
7 an app on a phone to enter the availability of a  
8 certain amount of organic commodity, say corn.  
9 The certifier could approve it as a valid  
10 product. Then when somebody else on the chain,  
11 this Blockchain, takes ownership of a certain  
12 amount of the corn, the chain could record the  
13 changes in inventory as it passes from one player  
14 to another, all the way to the receiving  
15 processor. Blockchains are designed to confirm  
16 transactions as valid and authentic. There are  
17 lots of different ideas for how this kind of a  
18 system could work. It could be a distributed  
19 industry-run system, with federal oversight.

20 Given the way organic certification is  
21 structured in the law, it is a public-private  
22 partnership, with the certifiers and the industry

1 doing a lot of the transaction work directly. So  
2 it could be an industry-run system with federal  
3 oversight. It could also be a federalized data  
4 warehouse. It could involve tracking devices  
5 associated with shipments. It could involve  
6 global positioning system data.

7 It could pull acreage data from  
8 integrity. There might be many, many, many other  
9 options. We are in the earliest stages of  
10 envisioning the different possible concepts of  
11 operation and look forward to learning together  
12 what the possibilities here might be. Let's turn  
13 to how the NOSB can help. Paul opened by  
14 reminding that we had sent a memo to the Board  
15 this summer, so here's some specifics, in terms  
16 of ways in which the NOSB might be able to help.  
17 You learned a lot about government systems  
18 involved in overseeing imports, but these are  
19 areas we think the NOSB could provide proposals  
20 to advance our work in this area. We're open to  
21 other ideas here. This is a starting point for  
22 consideration.

1           First, No. 1, as representatives of  
2           the organic community, provide your insights to  
3           USDA on the respective roles of industry,  
4           certifiers, and AMS, when it comes to protecting  
5           the organic integrity of imports. Again, you've  
6           learned a whole lot about the government systems  
7           involved here, given the structure of the organic  
8           system that we have, that includes the government  
9           certifiers and trade.

10           How could that framework -- within  
11           that framework, how could we consider new  
12           technologies and practices? These insights need  
13           to stay within our existing regulatory framework  
14           and authority, so start with the system we have  
15           and contemplate what the different roles could  
16           be. What do you see as best practices for how  
17           industry, certifiers, and AMS should each engage  
18           with this problem through the existing system?  
19           Again, you've gotten a glance at what the  
20           technology side looks like on the government  
21           side. What roles could industry and certifiers,  
22           what could those roles look like. Second, the

1 current accreditation system focuses, really, on  
2 audits of specific certifiers. We go out and do  
3 on-the-ground audits and witness inspections with  
4 specific certifiers.

5 We have started to talk about how to  
6 design and implement full supply chain audits.  
7 Often, complex supply chains involve many  
8 certifiers operating in many countries. How  
9 could supply chain audits that truly trace from  
10 farm to table and back again be structured and  
11 implemented? That's a proposal that could really  
12 help us consider new ways of approaching these  
13 problems.

14 Third, I gave a brief overview of  
15 Blockchain. As representatives of the organic  
16 community, if that kind of international supply  
17 chain traceability system were to be implemented,  
18 who do you think should be doing what? What  
19 could the chain look like, in terms of  
20 governance? This is a very, very new and  
21 emerging area. If you chose to really dive into  
22 this item, we'd give you a crash course on

1 Blockchain. We've done some learning, to date,  
2 on Blockchain and different ways it could  
3 potentially be used, so we would give you more  
4 background on that particular technology.  
5 Finally, No. 4, inspectors really do play an  
6 absolutely critical role.

7           They must know how to and effectively  
8 complete advanced auditing activities, such as  
9 mass balance and traceback audits. We know the  
10 performance evaluations are a critical aspect of  
11 ensuring that inspectors are able to do this  
12 really complex work. What evaluation criteria  
13 and testing should certifiers be implementing to  
14 ensure their inspectors are skilled in these  
15 audit activities, particularly as supply chains  
16 become more complex?

17           How should certifiers assess and  
18 document these skills as part of the performance  
19 evaluation process? That's it. We're not  
20 expecting the Board to take on all these items,  
21 but these are needs that we've identified in NOP,  
22 that we believe the Board could have unique

1 insights about. So we're sharing them with the  
2 Board today, and with the public, to get you  
3 started on what is very clearly a very, very  
4 complex topic. I'm going to close, again, by  
5 thanking Mike, Daniel, and Matt, really  
6 appreciate your being here, so thanks.

7 DR. LEWIS: Before I turn the meeting  
8 back to our chair, Tom Chapman, I want to echo my  
9 colleagues, thanking, also, Jenny and my federal  
10 colleagues for all your work preparing for  
11 today's import panel and to now move the  
12 discussion to you, to members of the Board, in  
13 terms of this is the first educational  
14 opportunity and the background to help you  
15 provide advice to us and recommendations on  
16 improving oversight imported organic products.  
17 Tom, the floor is yours.

18 MR. CHAPMAN: Thank you. I'm going to  
19 start with a few questions, and then open it up  
20 to the Board to ask questions, as well. I see  
21 you, Francis, but I'm going to start with a few,  
22 and then I'll move on to other members. I see

1 Harriet and Dan, so one second. First off, one  
2 of the notes that was raised, I think especially  
3 by you, Michael, is there's 47 agencies, and  
4 there's a need to prioritize amongst all of them  
5 how systems in ACE are set up. I guess I'm  
6 curious to know how is that prioritization set,  
7 and what can be done by the NOSB, the AMS, or the  
8 community to sufficiently prioritize the organic  
9 integration into that system, based on the OIG  
10 audit?

11 MR. DURANDO: Thank you, Mr. Chairman.  
12 Probably what I was referring to, now that ACE is  
13 built, and it's operating, or as we say, in  
14 production, we now have all of these agencies at  
15 various stages of completion of their own  
16 systems. The actual core development, as Daniel  
17 referred to it, for ACE is completed.

18 CBP doesn't have core development  
19 contractors on hand at this stage. The next step  
20 is how does CBP, moving forward, prioritize the  
21 work that is put before it from all of these 47  
22 agencies? One of the governance entities I

1 referred to was the Border Interagency Executive  
2 Council.

3 Not to try to pass it off on other  
4 workgroups or acronyms, so I apologize in  
5 advance, but that is really where that group has  
6 been toiling now for a number of months. I'm  
7 being very transparent. How does one reconcile  
8 not really competing needs -- we're all  
9 complementary, as government agencies, having to  
10 work together, but if everybody's lining up with  
11 work, how does that get prioritized, given the  
12 fact that you're going to have enough contractors  
13 only to do so much at a time? That process isn't  
14 resolved at this time.

15 I don't want to get too far ahead, but  
16 if NOP has a new build with, say, a message set,  
17 it might really depend on how large that is, what  
18 the level of effort is, as they say. Of course,  
19 if NOP's got the money ready to go -- I know  
20 there's been efforts that Jenny's referred to on  
21 the hill to line that up -- that can play a role.

22 Last, but not least, then maybe I'll

1 see if Daniel wants to add anything, is a lot of  
2 that prioritization may come once we have a full  
3 complement of political appointees, not only in  
4 the Department of Agriculture, but in all of the  
5 other departments around the federal government.

6 Because those political appointees  
7 will have significant -- underline significant --  
8 impact on what gets prioritized. With all due  
9 respect to any of us in federal service, there's  
10 a big difference between a Mike Durando or a  
11 Jenny Tucker or a Matt Farmer trying to stake out  
12 a priority with CBP, as compared to, say, our  
13 deputy secretary or our secretary of agriculture.  
14 Indeed, the whole build out for ACE, and the big  
15 push for the last two or three years, was  
16 actually overseen at the deputy secretary level.  
17 We have a deputy secretary now.

18 We have an undersecretary now, I'm  
19 told. Since I left town yesterday, that's taken  
20 care of. It's early. We don't know what's  
21 happening today. But that's going to play a  
22 role. In the end, I think the mission is there.

1 It's a matter of working through the dollars and  
2 the resources. Daniel, would you want to add to  
3 that?

4 MR. COLLIER: Sure, I could add a  
5 little bit. Just to add on to what Mike said,  
6 regarding the stage where we are now, the ongoing  
7 operations and maintenance of the system involves  
8 not only what we call critical fixes to the  
9 system -- when problems arise, when bugs are  
10 identified, when certain minor changes need to be  
11 made, we have the funding to do that right now,  
12 which is what we're focused on, essentially, to  
13 keep the system going. In addition to that,  
14 there is what we call -- what was once core work,  
15 work that was originally designated as work that  
16 needed to be done prior to December 2016 that,  
17 for various reasons, has now been grouped into  
18 post-core work now. On top of the operations and  
19 maintenance, after that, the priority for us has  
20 been completion of that work, which was  
21 originally identified as core.

22 The third level is now the post-core

1 development, purely post-core, so not operations  
2 and maintenance, not holdover from core  
3 development. That involves, as I mentioned  
4 earlier, various requests for development from  
5 the agencies within CBP, as well as from the  
6 trade.

7 As Mike mentioned, that process for  
8 prioritization is still in the process of being  
9 ironed out, but I will say that an agency that is  
10 able to fund its own request, is able to help pay  
11 for that development, will most likely be higher  
12 on the priority list, and/or an agency that has  
13 the regulations to back up the requirement, so in  
14 other words, an agency that is mandated to  
15 fulfill a certain regulatory requirement that  
16 currently is not in place in ACE. That would be  
17 something we -- that's another factor that we  
18 would look at that would drive that request  
19 towards the top of our priority list.

20 MR. CHAPMAN: Thank you. There was  
21 mentioned several times, and you almost were  
22 touching it, I think, there on the end, about

1 ensuring that the agencies have the sufficient  
2 legal authority and regulatory systems in place  
3 -- and maybe, Jenny, this question is best for  
4 you. Under OFPA and other statutes out there,  
5 does the NOP have sufficient regulatory authority  
6 to control imports through the ACE system?

7 DR. TUCKER: That's a good question.  
8 The act prohibits the representation of a product  
9 as organic unless it's certified. We do not  
10 have, right now, stop import or stop sale  
11 authority. If we could identify the product and  
12 get the information about it, right now, we don't  
13 have the authority to say stop, you can't sell  
14 that.

15 I think we have the authority to get  
16 -- I think, I hope -- into the system -- this is  
17 part in our OIG audit response, where we say we  
18 have to have conversations with CBP about how do  
19 they interpret our authority, and what we have  
20 right now, what would that allow CBP to do and  
21 what wouldn't it allow CBP to do? We know we  
22 don't have stop sale authority, but we have other

1 authority, so how would they interpret that?  
2 That's, again, the beginning of a conversation  
3 that is real critical in the next few months  
4 here.

5 MR. CHAPMAN: Something like a stop  
6 import, stop sale authority would be through an  
7 act of Congress; it's not a regulatory thing?

8 DR. TUCKER: I believe that would have  
9 to be a change to the act.

10 MR. CHAPMAN: Thank you. Then one  
11 last, and I'll open it up to -- I have Frances,  
12 Harriet, then Dan -- in broad timeline  
13 perspectives, you talked about starting with  
14 equivalencies, and then expanding to  
15 non-equivalencies. Do you have a rough time  
16 frame, the roughest of time frames?

17 DR. TUCKER: Our first step is going  
18 to be coming up with this concept of operations,  
19 working with CBP to identify the requirements. I  
20 think that is the really -- planning always, done  
21 well, takes a good amount of time. By July of  
22 next year is when we owe OIG our concept of

1 operations. I think we'll know a whole lot more  
2 by then. At that point, we've already started  
3 conversations. We've already had somebody who's  
4 literally sat in front of a word processor and  
5 actually written the message set. We have  
6 somebody who's -- anything that doesn't cost  
7 contract dollars right now we've already started  
8 on. We've sent over draft message sets, how do  
9 these look? That conversation has started.

10 I think once you get the mechanics  
11 figured out for a certain set of countries, my  
12 guess is that it's not hard, necessarily, to  
13 scale out. That is, again, though, another limit  
14 -- right now, import certificates are required  
15 under the equivalency agreements, which is why  
16 we're starting there. They're not required for  
17 any other country.

18 That's another layer of that  
19 regulatory complexity that we would need to talk  
20 to CBP. Right now, important certificates are  
21 not part of the regs. Would they have to be for  
22 CBP to accept them, or can they go ahead and say

1 stick them in there? I don't know the answer to  
2 that, and I don't want to put them on the spot.  
3 Again, part of the beginning of a conversation of  
4 how the authorities work.

5 MR. CHAPMAN: Real quick, if we wanted  
6 to expand import certificates to all imports,  
7 would that be a regulatory change only, or would  
8 it also require a legislative change?

9 DR. TUCKER: I believe that could be  
10 achieved through regulations, but anything is  
11 stronger when it's at an act. The way the  
12 hierarchy works is there's an act, and then  
13 there's a reg. Daniel's nodding, so I assume  
14 that they would think that an act would have more  
15 power than a reg, but I do believe that's a  
16 requirement in the reg. These guys are looking  
17 at me. I assume you're going to wave if I say --

18 MR. DURANDO: I might just chime in  
19 here. I'm not versed in the organic act. Let me  
20 put that right out there. But as a person who  
21 oversees an operation, that's what we do is  
22 regulatory work, 100-150 rulemakings a year. It

1 really is a matter of taking a look at that  
2 statute.

3 We, the agency, has to sit down with  
4 our Office of the General Counsel and figure out  
5 how much wiggle room you've got with the words  
6 that are actually in the law. How far can you  
7 go? Then back to Jenny's point, from there --  
8 this is what Daniel and the CBP's going to look  
9 for -- once you figure out your wiggle room and  
10 how far you can take the authority, then you've  
11 got to get it in real words in the regulations,  
12 so that the regulations spell out -- that's where  
13 the detail is. That's the execution of it, what  
14 you can and you cannot do.

15 I know from experience at working on  
16 CEMS with CBP, there was a time where CBP would  
17 not even give an agency access to the data, just  
18 raw data coming through the ACE portal, without  
19 showing them your regulatory authority to even  
20 see that data. They're very, very protective of  
21 that, as they should be. To set up a system down  
22 the road with NOP, these message sets or

1           whatever, they're going to want to see where's  
2           your authority to do this.

3                         There'll be some work to do. Jenny's  
4           right. It's really hard to say exactly do you  
5           have to make a statutory change or regulatory  
6           change. I'm not versed in it, but it's all very  
7           doable, but it's a lot of work and our attorneys  
8           do get involved within our Office of the General  
9           Counsel.

10                        MR. CHAPMAN: Thank you. Francis.

11                        DR. THICKE: I really like that, what  
12           Jenny suggested, exploring the development of an  
13           international supply chain traceability system.  
14           During the break time, somebody reminded me that  
15           OCIA always had these transaction certificates,  
16           so that if a farmer had 100 acres of corn, got  
17           150 bushels an acre, that'd be 15,000 bushels.

18                        Every time that farmer sold any corn,  
19           a transaction certificate would go with it. That  
20           farmer could sell no more than \$15,000 worth of  
21           transaction certificates. The buyer maybe bought  
22           200,000 bushels, would have to have a transaction

1 certificate for every bushel total. That could  
2 be done electronically. I think that would be  
3 really a way to go. It's nothing radical. It's  
4 something we've done in the past.

5 DR. TUCKER: Thanks for that feedback.  
6 That's a great example. I think different  
7 certifiers are doing different things. There are  
8 some certifiers who are already doing this. They  
9 are tracking inventories. Yes, that's a great  
10 example of how this could work out. Then the  
11 question is how do you get that into, then, a  
12 system where data between certifiers can flow  
13 over an entire supply chain? I think that has --  
14 it's a lot of very interesting potential. Thanks  
15 for the example.

16 MR. CHAPMAN: Harriet.

17 MS. BEHAR: I understand that we're  
18 talking -- the regulatory need for a government  
19 stop sale, but I am wondering if, through ACE, if  
20 the NOP can become a PGA -- I'm trying to work  
21 all my acronyms here -- or other way for there to  
22 be a notification, especially just something

1 simple, like it came in as an organic product,  
2 and it was fumigated with a prohibited substance.

3           Would there at least be some kind of  
4 notification because we wouldn't necessarily have  
5 to have a government stop sale on it. We have a  
6 robust certification system, ourselves. If  
7 certifiers were aware that this -- there was a  
8 compromise to the organic integrity of the  
9 product somehow -- I just don't know how NOP  
10 becomes a PGA through ACE.

11           MR. FARMER: This is Matt Farmer.  
12 Great question. You're absolutely right. There  
13 is an in-between period between, maybe, if they  
14 have to look at, maybe, a reg change or a new  
15 act, which that would be a huge undertaking. We  
16 have found a temporary bridge. You're absolutely  
17 right. In working with PPQ, Plant Protection and  
18 Quarantine deputy administrator and Deputy  
19 Administrator McAvoy, through that MOU, we did  
20 arrange for information to be passed over. We're  
21 still working out the kinks in that system. When  
22 you do any systems change, there's a process in

1 there. We did it, actually, pretty quickly. We  
2 were able to stand that up.

3 I did want to point out that we  
4 trained APHIS employees on how to recognize  
5 organic shipments. When organic shipments come  
6 into a port of entry, there's not the big label  
7 up there on a shipment. It could be a bulk  
8 vessel of grain that has no labeling and has no  
9 documentation. It's not coming under a tariff  
10 code for organic commodities.

11 That was provided by the organic  
12 program to assist us with training APHIS  
13 personnel in how to identify. We provided a  
14 couple changes to two systems. We added an NOP  
15 disclaimer, which helps them on their compliance  
16 and enforcement side. Additionally, when we do  
17 have information that leads us to believe this is  
18 an organic shipment, that we did apply a  
19 phytosanitary treatment, we do notify the organic  
20 program. Like I said, some of that is right now,  
21 I'm picking up the phone and notifying them, but  
22 we're working out to have it automated within the

1 system.

2 MS. BEHAR: Then the NOP, would it  
3 have access to your system? They're not an  
4 approved PGA yet, is that right?

5 MR. FARMER: No, but within USDA and  
6 our MOU, we've worked to provide information of  
7 possible non-compliance with their reg.

8 DR. TUCKER: A very quick comment on  
9 that. One of the things we're learning about  
10 with APHIS is how does that data come in. It  
11 doesn't necessarily come in and say the certifier  
12 is this certifier, or this is the operation. It  
13 doesn't necessarily come in as data that's  
14 immediately I can send that to the certifier.

15 Some of it is we have to figure out  
16 how do we read the data that's coming in to us  
17 and, frankly, notice some pattern. If we know  
18 that there are certain fruits or vegetables that  
19 are from a certain country are always going to be  
20 treated, so they really shouldn't be sold as  
21 organic in the U.S., knowing where those trends  
22 are. Again, I'm going to, one more time, plug

1 for the importance of using the taxonomy in the  
2 organic integrity database that can help us more  
3 quickly identify which certifiers are operating  
4 in which countries, with which commodities, so  
5 that we can more easily take that data from APHIS  
6 and let's run a very quick report on which  
7 certifiers are working with this commodity, from  
8 this country. That would be -- instead of this  
9 one off on each shipment, start noticing these  
10 trends and get the word out about that, so it is  
11 a double feedback loop.

12 MR. DURANDO: Tom, can I just finish  
13 up on her question? The whole issue, again, of  
14 PGA, don't get too hung up on that. I would  
15 encourage you not to. In essence, AMS is a PGA  
16 right now. NOP is part of AMS.

17 Actually, as NOP moves forward on  
18 whatever its solutions are, different message set  
19 or sets, plural, etc., those ultimately become  
20 encompassed in an overarching document called a  
21 CATAIR document, which stands -- we had to look  
22 it up. I couldn't remember it. It's the CBP and

1 Trade Automated Interface Requirements. AMS and  
2 every other PGA has its own CATAIR. We moved  
3 forward with CBP as an agency. That opportunity  
4 is there to make that happen, just a matter of  
5 time.

6 MR. CHAPMAN: Could you fit more  
7 acronyms in that sentence?

8 MR. DURANDO: We even had to look it  
9 up. I use the word every day.

10 MR. CHAPMAN: Real quick, the  
11 notifications that you're talking about now, is  
12 that mostly based on organic-specific HS tariff  
13 codes?

14 MR. FARMER: No, it could be anything  
15 from -- because shipments will come in that will  
16 say organic, but it's not under -- it's under the  
17 conventional tariff code. It could be labeling  
18 on the box. It could be any other documents that  
19 are provided with the entry that leads them to  
20 believe it's organic.

21 MR. CHAPMAN: Then under the current  
22 system, if an organic HS tariff code, though,

1 does have a fumigation on it, is there -- are  
2 those caught, or would those -- it's potential if  
3 it was noticed by the person in charge?

4 MR. FARMER: Definitely. Within the  
5 system, it would be identified, and it would be  
6 passed along to NOP.

7 MR. CHAPMAN: Dan, then Dave.

8 DR. SEITZ: Michael, I'd like to  
9 understand a little bit more what the final  
10 system is going to look like that you've  
11 described. It sounds like with the paper review  
12 that you did initially, that was probably a  
13 spot-checking system, right? You couldn't  
14 possibly look at the paperwork for all the  
15 imports coming in.

16 MR. DURANDO: It was a de facto spot  
17 check. Let me leave it that way.

18 DR. SEITZ: Okay. It sounds as if  
19 what you're aiming for is being able to  
20 comprehensively make sure all the paperwork is in  
21 place for any import through the electronic  
22 system. Is that fair, that you would at least be

1 able to track all the paperwork for every import  
2 that's coming in? Is that the goal, or it would  
3 still be a de facto spot checking, but just on a  
4 much broader scale? Just trying to understand.

5 MR. DURANDO: The goal, and hopefully  
6 the outcome, is 100 percent visibility. So every  
7 single item that's being imported into the United  
8 States, electronically, the documentation has  
9 been entered, fields have been filled, and then  
10 100 percent of those shipments that require  
11 inspection, we would receive electronic  
12 notification of that. Our goal is 100 percent  
13 reconciliation.

14 DR. SEITZ: Then, as someone who's new  
15 to this whole area, I'm curious to know is there  
16 regulatory authority to test, in any way,  
17 shipments that come in that may be suspect, so,  
18 for instance, testing for pesticides that would  
19 not be on an organic product? Apart from the  
20 paperwork being in place, are there other things  
21 that, then, you can do if any questions are  
22 raised in your mind?

1           MR. DURANDO: In my organization, and  
2           in our legal authority, we do not have the  
3           authority to test for pesticides or require a  
4           test. We do have, in an instance or two, the  
5           authority to test for aflatoxin. We require  
6           that, and it must be within a minimum threshold  
7           or maximum threshold to enter. If an agency --  
8           I'll go out on a limb -- had the authority to  
9           require that all imports be tested for some sort  
10          of chemical residue --

11          DR. SEITZ: Or suspect ones.

12          MR. DURANDO: -- or suspect -- and  
13          meet a certain standard, could a system be built,  
14          similar to ours, that would track that and  
15          enforce that? Yes, it could be done, but there  
16          would have to be the legal authority to do that.  
17          That's not within the scope of my program.

18          DR. SEITZ: Then a final question is,  
19          again, from a naive standpoint, are there typical  
20          ways that fraud is perpetrated through imports?  
21          If we're trying to understand how we might  
22          address this on an NOSB level, what would be the

1 two or three typical ways that this happens, if  
2 you can even describe that?

3 MR. DURANDO: I'm not sure I would  
4 want to go out there. I think more often than  
5 not, compliance violations, I want to believe,  
6 are inadvertent or unintentional, although  
7 probably the most common form, in our case, is  
8 for products to be mislabeled, perhaps being a  
9 certain classification of a commodity that is  
10 exempt, compared to the regulated version of that  
11 commodity.

12 You might have mislabeling, or there  
13 can be -- we've worked with CBP on a number of  
14 cases where product was -- the importer or the  
15 broker was assigning an inappropriate HTS code,  
16 an HTS code that would cause it to circumvent our  
17 regulations. The trick is with the mass volume  
18 of traffic entering the United States of product,  
19 CBP isn't necessarily in a position to look at a  
20 product and say whether the HTS code does or  
21 doesn't match.

22 It may be an HTS code for that

1 commodity, but it's of a classification that  
2 there's no way, visually, they could determine.  
3 That would be the other area. We've had a couple  
4 instances of that. That would be all I could  
5 give you at this point.

6 DR. SEITZ: Great, thanks.

7 MR. CHAPMAN: Dave.

8 MR. MORTENSEN: Yes, thank you. I  
9 have a question similar to Dan's. There's been  
10 quite a change in import/export volume over the  
11 last recent years. I was looking at a recent ERS  
12 report. Exports of organic products valued \$412  
13 million in 2011 and \$548 million in 2016.

14 During the same time interval, imports  
15 were valued, in 2011, at \$600 million, so roughly  
16 equivalent to exports, but have tripled in the  
17 same period of time, to 2016, to \$1.65 billion.  
18 In trying, as Dan was asking, to wrap our heads  
19 around the capacity of our system to track  
20 things, could you guys reflect -- that's a gender  
21 neutral, inclusive you folks -- project where are  
22 some of the greatest vulnerabilities in

1 certifying what's going on the ground and in  
2 tracking in the pipeline, i.e. in the ships, the  
3 documents and all that, when a system is  
4 challenged in a way that the sales increased  
5 3-fold over a very short period of time?

6 For some of these commodities, like  
7 wheat, it increased 25-fold in five years,  
8 soybeans and corn 4.2 and 4.4-fold increases in  
9 mass of grain coming in. I'm just trying to --  
10 related to my morning question about a  
11 sensitivity analysis is trying to -- is this a  
12 computer tracking problem, or is this an  
13 on-the-ground problem? Is it boots on the ground  
14 at the ports or in the fields in Turkey and  
15 Lithuania? Anybody care to just help enlighten  
16 us on that?

17 MR. DURANDO: I guess maybe I'll --  
18 maybe Matt's going to say something. I don't  
19 have a lot to offer there. In most instances --  
20 I know in our case, and maybe one can  
21 extrapolate, it's a matter of having -- again,  
22 back to the statutory and the regulatory

1 authority to do something, or to enforce, and  
2 then it would be resources, whether it's boots on  
3 the ground or automation. I know in the  
4 specialty crop, fruit/vegetable specialty crop  
5 arena -- I don't have the numbers in front of me,  
6 but I know the Department and the trade  
7 organizations all report imports of fruits and  
8 vegetable specialty crops are continuing to  
9 increase.

10 We're a deficit country now. More  
11 than 50 percent of our consumption is imported,  
12 and that's going to just continue to grow. I  
13 would argue maybe in our case, we're meeting that  
14 growth or that demand through automation.  
15 There's no other way around it for us. We  
16 couldn't put the number of people in place to  
17 handle all the paper and everything else. That's  
18 what I would offer on that. Matt or Daniel, do  
19 you guys have a thought?

20 MR. FARMER: Absolutely. It doesn't  
21 matter if I'm wearing an NOP hat or an APHIS hat  
22 or a CBP hat. Especially when you're looking at

1 price differences in commodities, from  
2 conventional to organic, you're going to have  
3 people try to circumvent the system. What those  
4 weaknesses are, they range from certification up  
5 through mixing, partial mixing. It runs the  
6 gamut. You're absolutely right. With the  
7 government-to-government certifications, and with  
8 greater information that ACE ITDS will provide, I  
9 have no doubt that in the present and moving  
10 forward, that we have confidence in the system to  
11 determine where those weak points are.

12 MR. MORTENSEN: It would be helpful,  
13 and maybe there's not time to get into that now,  
14 but it sounds to me like ACE for organic could  
15 take a while, it sounds like, from what you  
16 presented. It would be helpful for us to, as a  
17 Board, think about what is done in the interim.

18 Personally, I still am concerned about  
19 whether we have the right kind of boots on the  
20 ground ratio to deal with a three-fold increase  
21 in imports, but we'll continue to try to figure  
22 that out as we go along with some of the

1 questions that the Board is considering taking  
2 on, but thanks for your answers.

3 MR. CHAPMAN: Thank you for people  
4 paying attention. You'll notice it's 12:30. We  
5 are going to run into lunch a bit if the panel  
6 experts have time to sit for a few more  
7 questions. I think this is an important  
8 dialogue, and I would like to make the most use  
9 of all you folks' time, if possible. Up next I  
10 have ASA, and then I had A-dae.

11 MR. BRADMAN: I just had a brief  
12 question. I think it was mostly answered. When  
13 you said the goal was to look at basically 100  
14 percent of imports, I'm wondering is that going  
15 to be phased in, or is that current, and is there  
16 a threshold, in terms of volume or tonnage or  
17 dollars for different products that would trigger  
18 this evaluation, or is the goal really 100  
19 percent, and how close to 100 percent are we?

20 MR. DURANDO: To be clear, the law  
21 hasn't changed. There always has been a  
22 requirement that 100 percent of the products

1 represented in those 14 commodities in the case  
2 study I presented, 100 percent of them must be  
3 inspected, of those shipments, before they're  
4 allowed to clear into the United States. The  
5 challenge, again, has been visibility. I guess  
6 you could argue we are phasing it in. I  
7 mentioned that we have a pilot program underway.  
8 With that program, it's 5 to 10 percent or so of  
9 the imports. The reason we did that wasn't  
10 necessarily worrying about catching people and  
11 wanted to give them a chance. They've known for  
12 years that they have to comply, and we've been  
13 out there leveraging penalties and fines and  
14 everything else.

15           It was a matter of ensuring, No. 1,  
16 that the message sets and everything else was  
17 working correctly in ACE, but secondly, make sure  
18 that our system, or CEMS, was stable, operating,  
19 debugged and everything else.

20           At that point -- the other piece of  
21 it, when you're dealing with all of these  
22 commodities -- I think Daniel or Matt was

1 reminding me earlier this morning, it's really  
2 the import brokers who are a pivotal entity in  
3 this whole process. These are very large  
4 operations.

5 They're all having to build out their  
6 own systems, their own software, so that it will  
7 effectively communicate, if I'm correct, with ACE  
8 and such. They're going to be able to message  
9 with the rest of the universe. For many of these  
10 companies, this is large, large investments in  
11 technology, and it also is taking them time.  
12 Some of them have been at it for a year, two,  
13 three, four years. A lot of them have been -- we  
14 have trade representatives. You have folks like  
15 UPS and FedEx and others on that ITDS board of  
16 directors. They've all been involved trying to  
17 bring the trade along.

18 Yes, it's a phase in, so to speak,  
19 with a pilot program, but once we put the  
20 regulation in place that says it's mandatory that  
21 you file in ACE, it will go, overnight, from 5 or  
22 10 or 15 percent to something much closer to 100

1 percent, and then there will undoubtedly be a  
2 lag, not really because of will, a matter of just  
3 brokers gearing up fast enough.

4 You'll see, probably, a reshuffling of  
5 the trade. They're going to say I need to make  
6 sure I have a broker who is ACE compliant.  
7 They're going to gravitate over there while their  
8 other broker continues to build out their system.

9 I don't know if that answers your  
10 question. Didn't want to go down a rabbit hole  
11 there, but it's not -- but there's been no change  
12 in our compliance enforcement stance, if you  
13 will; 100 percent have always been required to  
14 meet those standards.

15 MR. FARMER: Just so we're clear, the  
16 APHIS and CBP inspections are for APHIS  
17 regulations. I don't believe anyone at a port of  
18 entry is looking to see if that shipment that  
19 came in is compliant with NOP organic standards  
20 unless there was an issue with a pest being found  
21 and we treat it.

22 Then we would look at the documents

1 for NOP and provide that information over. Just  
2 so we're clear, because I think some of the  
3 questions were about the boots on the ground.  
4 Correct me if I'm wrong, but there's no NOP  
5 personnel at ports of entry.

6 DR. TUCKER: Right, that's correct.  
7 We have certifiers on one side, and certifiers on  
8 the other side. We do not have anyone at the  
9 border, nor do we have the authority at the  
10 border.

11 MR. CHAPMAN: A-dae.

12 MS. BRIONES: Mr. Farmer, you briefly  
13 described one of the ongoing initiatives with  
14 ACE. Looking at the biotechnology regulatory  
15 services, what data are you tracking in ACE  
16 regarding the BRS stuff? Can you just describe  
17 that in detail a little more?

18 MR. FARMER: I wish I could. What I  
19 can do is get the information of what BRS will  
20 be. I know they're part of our APHIS core team.  
21 Their documents for entry requirements, that is a  
22 good questions. I definitely will get back to

1 you on what information they're collecting.

2 MR. CHAPMAN: Thank you. Steve.

3 MR. ELA: Jennifer, as I understand  
4 it, given what we've said, regulatory  
5 environments -- the organic system is a  
6 paper-based system. As you said, we have  
7 certifiers here. They generate certificates. We  
8 have certifiers over here that are supposed to  
9 check those certificates. The only way, at this  
10 point, that I see, as I'm hearing, that we can  
11 enforce these fraudulent shipments is after the  
12 fact of saying you've misused the word organic.

13 DR. TUCKER: I do think there are  
14 actions that are being taken and can be taken  
15 right now. Yes, we've been spending a lot of  
16 time about paperwork and data being transmitted,  
17 and every single operation must be inspected  
18 every single year. Those boots on the ground,  
19 the reality is the certifiers have the inspectors  
20 on the ground to do things like mass balance and  
21 traceback audits. What did you take in, and what  
22 did you send out? If that is being done at every

1 single operation across the supply chain, then I  
2 think that can really help. The certifiers know  
3 what to look at, at these certificates. We're  
4 all learning.

5 We have very sophisticated actors that  
6 are learning how to do -- they've learned how to  
7 do this, and we need to learn what they are  
8 doing. But we are learning what do you look at.  
9 When you have documentation that crosses borders,  
10 not in the U.S., but between two other borders,  
11 depending on what the countries are, what  
12 documentation do you look at?

13 What do you look at on their  
14 certificate and all their supporting documents?  
15 How do you weave that thread? I think we have  
16 certainly learned a tremendous amount about how  
17 the paperwork works -- on the ground audits and  
18 inspections and did you really -- can we actually  
19 trace what happened at this operation, so every  
20 certifier can say yes, I believe this operation  
21 is in full compliance, and I have all of these  
22 inspection records and traceback mass balance

1 audits to prove it. I think that's something we  
2 can all do now, today.

3 MR. CHAPMAN: Harriet.

4 MS. BEHAR: The Organic Trade  
5 Association recommended that port of entries  
6 become a certified entity. Is that even possible  
7 -- certified organic -- in their comments to the  
8 Board. Having never been to a port of entry, I  
9 don't know how that might be accomplished.

10 DR. TUCKER: That's a great question.  
11 I think as we're looking at these concepts of  
12 operation, I understand your ports have multiple  
13 entities operating at the port. They're all  
14 distinct entities operating there. Whether the  
15 entire port or subsets of the port could be  
16 certified, I think, is a great question. It  
17 would be part of the concept of operations.  
18 Daniel, anything that you can say on that? I  
19 don't want to put you on the spot too much.

20 MR. COLLIER: That's actually the  
21 first I've heard of that concept. Was there  
22 anything in the details of that recommendation

1 about how that would work, or was it just a  
2 general recommendation?

3 MS. BEHAR: I suppose when they give  
4 public comment, we can ask. It was a comment  
5 that -- because the port of entry is part of that  
6 physical transfer area, and that's the way our  
7 certification system works is everyone who's  
8 physically handling a product through the chain  
9 is inspected to make sure that they are not  
10 providing prohibited materials, they're not  
11 comingling. They have personnel that understand  
12 the organic certification system.

13 MR. CHAPMAN: Scott, do you have any  
14 thoughts, as a certifier?

15 MS. BEHAR: I have no idea, maybe  
16 Scott? I've never been to a port of entry.

17 MR. RICE: We have a couple of ports  
18 in Washington State that are certified. Our  
19 agency does not certify them, but another  
20 certifier does. I think you kind of described it  
21 as it happens. As much as you have a split  
22 operation or a split handler that may be handling

1 both organic and non-organic product, you have  
2 measures in place for cleanout and handling, as  
3 you would see in other lines.

4 DR. TUCKER: That's really helpful.  
5 Eventually, perhaps in the Organic Integrity  
6 Database, we could have port as a business type.  
7 There's a lot happening. Again, all of this --  
8 we're still learning, too, so all of this is  
9 really helpful in bringing your experience and  
10 knowledge out there of what's happening back to  
11 this group, so thank you.

12 MR. CHAPMAN: All right, I think  
13 people are getting antsy for their lunch. I'm  
14 going to wrap it up with two quick questions, and  
15 then thank you guys for your time. One question,  
16 and this is probably directed best at APHIS -- I  
17 guess probably any of you.

18 We have this organic certification  
19 scheme in place, where we require practiced  
20 standards of operation. There's going to be  
21 certified handling operations within the U.S.  
22 that then receive these products, at some point,

1 that are imported.

2 Are there best practices or documents  
3 that they could use or they should be looking at  
4 to determine if a product was treated, at some  
5 point in the import process, phytosanitary  
6 certificates or others? Are there documents that  
7 they should be requesting to ensure the integrity  
8 in the supply chain?

9 MR. FARMER: Yes, and no. When we  
10 take a phytosanitary action on a shipment with a  
11 treatment, there's going to be an emergency  
12 action notification, which is the -- it'll either  
13 be a CBP Form 523 or a USDA Form 523. Those  
14 would be attached -- usually, the importer is  
15 unaware of what's going on with their shipment  
16 while it's at the port of entry.

17 It's their broker that has the  
18 awareness or is given the request if they want to  
19 re-export or treat the shipment. The broker  
20 would determine yes, I'll go ahead and treat the  
21 shipment. That could be an issue. Then there's  
22 the other one, which is a condition of entry

1 treatment.

2 That would not have a form, other than  
3 a certification of treatment, which there's no  
4 certificate provided. It's just done. You  
5 really have to be aware of what country commodity  
6 combination you're importing from and whether or  
7 not there's a standing treatment that's required  
8 for entry.

9 MR. CHAPMAN: That would be in those  
10 databases you mentioned earlier?

11 MR. FARMER: Correct.

12 MR. CHAPMAN: Then my last question is  
13 I noticed, Michael, under your presentation,  
14 there was a discussion around programs being  
15 focused around marketing orders and other  
16 commodity programs. I know there's an organic  
17 checkoff program proposal status working its way  
18 through whatever that regulatory system is. If  
19 that were to pass and become an official organic  
20 checkoff program, would that at all change the  
21 way you guys interface with organic imports?

22 MR. FARMER: It would not, my

1 understanding. That's a research and promotion  
2 program. I'll stand corrected. If anything, it  
3 may assess imported product to help fund those  
4 generic programs, but it would not change  
5 anything that we do.

6 Any of those 14 commodities that we  
7 regulate, to the extent that any of those are  
8 imported as a certified organic product, to us,  
9 that's interesting, in my division, but again, we  
10 wouldn't be looking at that as a criteria for  
11 entry and for any compliance enforcement.

12 If there were a research and promotion  
13 program up and running for certified organic  
14 product, and it did require that assessments be  
15 levied against the imported product, it would be  
16 logical, and it would flow from current practice  
17 that those overseeing that R&P program would be  
18 pulling data from the ACE portal and somehow  
19 using that to identify all imports of certified  
20 organic agricultural products. Then they would  
21 be using that to match that against assessments  
22 made by importers, but it wouldn't change

1 anything that we do.

2 Typically, our research and promotion  
3 programs do not have hold authority. They do not  
4 hold intact authority. All of the enforcement is  
5 really after the fact because the entity is still  
6 there. You can always go after them.

7 MR. CHAPMAN: Okay, thank you. We're  
8 out of time. I want to thank our panelists for  
9 their time and input and dialogue. I think it's  
10 important and vital to our community. Thank you  
11 for taking the time to travel out here with us  
12 today. Paul, do you want to say anything?

13 DR. LEWIS: I have nothing else to  
14 add, thank you, Tom, just to echo the support  
15 that my federal colleagues have -- again, this is  
16 part of an ongoing dialogue. I know we spoke  
17 about having another panel discussion looking at  
18 possibly a panel of certifiers. We'll be talking  
19 about that in due time. Again, part of an  
20 educational experience, so that we're looking  
21 forward, in terms of recommendations that Tom and  
22 the Board can provide, dealing with this

1 important issue. Thank you.

2 MR. CHAPMAN: Thank you everyone. We  
3 will now recess for lunch and start back up  
4 promptly at, I think it's 1:30, 2:00? We'll  
5 start right back up promptly at 2:00. We are now  
6 in recess.

7 (Whereupon, the above-entitled matter  
8 went off the record at 12:50 p.m. and resumed at  
9 2:10 p.m.)

10 MR. CHAPMAN: All right, we'll come  
11 back into order and proceed with our agenda. Up  
12 first is the National Organic Program with the  
13 materials update and the summary of new and  
14 outstanding petitions from Dr. Lisa Brines.

15 DR. BRINES: All right, good  
16 afternoon, everybody. So the purpose of the  
17 presentation today is just to give you an  
18 overview of materials that are of interest on the  
19 agenda today, but also what's in progress and  
20 might be on the agenda for future NOSB meetings.

21 So for this meeting, we have four  
22 petitioned materials that are on the agenda that

1 have proposals that came out of subcommittee that  
2 will be considered by the full board at this  
3 meeting. There are also 35 listings of materials  
4 on the National List which will complete the  
5 sunset process at the conclusion of this meeting.

6 In terms of the criteria that the  
7 board will use to evaluate materials, whether  
8 those are petitioned materials or materials being  
9 reviewed under sunset, those criteria are under  
10 statute in the Organic Foods Production Act, and  
11 they include a number of different criteria  
12 related to toxicity, human health, alternatives  
13 --- both alternative materials, and alternative  
14 practices that could be used in lieu of the  
15 petitioned substance. So those are the criteria  
16 for basing your decisions.

17 The petition guidelines that we have  
18 published in the program handbook, the template  
19 that we use for technical evaluation reports, and  
20 the NOSB review documents are all designed to  
21 align with those OFPA criteria to guide through  
22 the full petition process from the submissions,

1 through the technical report, to the NOSB  
2 documents that they are all aligned with those  
3 criteria that are under statute.

4 There are some additional criteria for  
5 handling substances, so the criteria are  
6 different depending on the use of that substance,  
7 whether it's for crop production, livestock  
8 production, or for processing or handling  
9 applications, and there is some additional  
10 criteria for synthetic processing aids as well  
11 that are in the regulations and not in the  
12 statute.

13 So for this meeting, the crops  
14 subcommittee is bringing forth a number of  
15 proposals for consideration by the full board.  
16 For petitioned materials, that includes a  
17 petition for fatty alcohols, which is a mix of  
18 octanol and decanol.

19 There is a petition for anaerobic  
20 digestate. It is not actually petitioning for  
21 addition to the National List, but does have some  
22 other issues that are of interest to the board in

1 terms of material usage in organic crop  
2 production.

3 In addition, there is an update,  
4 verbal update, that the board will not be voting  
5 on from newspaper and recycled paper. So that  
6 was not a result of a petition, but as a follow  
7 up from a previous sunset review.

8 In addition, since our last public  
9 meeting, the board did receive a petition also  
10 for ammonium nonanoate, and that petition is  
11 available to the public on the NOP website.

12 However, during the course of its  
13 initial review of the petition, the subcommittee  
14 determined that the petition did not meet the  
15 criteria for review because as a re-petition, it  
16 didn't provide sufficient new information to  
17 warrant review by the full board.

18 So those criteria for re-petitions, it  
19 is in the national petition guidelines. It's  
20 posted in the NOP handbook which is available on  
21 the website, and again, that petition is  
22 available to the public on our website as well.

1                   Okay, so what's coming up for the  
2                   crops subcommittee at future meetings? You have  
3                   a number of petitions that have been submitted,  
4                   many of which are undergoing technical review and  
5                   might come up at the next spring meeting. Those  
6                   include allyl isothiocyanate, natamycin, polyoxin  
7                   D zinc salt, sodium citrate, sulfur as a  
8                   molluscicide, ammonium citrate, and ammonium  
9                   glycinate.

10                   And some of you that have been around  
11                   for a few years might notice that there's some  
12                   familiarity with some of these substances  
13                   including allyl isothiocyanate, polyoxin D, and  
14                   the two ammonium salts. These are all coming  
15                   forward as re-petitions.

16                   So under our petition process,  
17                   petitioners don't have a process for appealing  
18                   decisions of the board, but again, according to  
19                   the national petition guidelines, they can submit  
20                   a new petition for consideration by the board if  
21                   that new petition provides new information that  
22                   wasn't considered during the initial review.

1           So all of these materials with the  
2           exception of natamycin are petitioned to add to  
3           205601 of the National List. The petitioner for  
4           natamycin is requesting a classification decision  
5           from the board.

6           Okay, moving onto the livestock  
7           subcommittee, they brought forth two different  
8           petition material proposals for consideration by  
9           the full board. Those include hypochlorous acid  
10          and sulfur. Those petitions both included a  
11          technical review prior to the proposal  
12          development by the subcommittee, and both the  
13          petitions and technical reviews are available on  
14          the NOP website.

15          Okay, so coming up from the livestock  
16          subcommittee at future meetings, currently under  
17          review is a petition for a glycolic acid. That's  
18          petitioned as a teat dip for dairy animals.  
19          Recently received a petition for oxalic acid.  
20          That's for control for varroa mites for honey  
21          bees, and there's also a pending petition for  
22          thymol which is used in foot baths for livestock.

1 So all of the petitions are currently available  
2 on the NOP website, and the technical reports,  
3 once they're completed, will be posted there as  
4 well.

5 Moving onto the handling subcommittee,  
6 we don't have any current petitions on the  
7 handling subcommittee part of the agenda for this  
8 meeting, but currently under subcommittee review,  
9 we do have a trio of these antimicrobial  
10 sanitizer type products that are currently under  
11 review and have technical reviews either complete  
12 or in development.

13 So that includes the silver dihydrogen  
14 citrate, sodium chlorite for the generation of  
15 chlorine dioxide gas, and sodium dodecyl benzene  
16 sulfonate or SDBS. So I believe all these three  
17 of those petitions, again, are available on our  
18 website and the technical reports have been  
19 completed or are close to being finished.

20 Also under review by the handling  
21 subcommittee we have three different agricultural  
22 substances that have been petitioned for use to

1 Section 205.606, so that's a section of the list  
2 that applies to agricultural substances that can  
3 be used in non-organic form if they are included  
4 on 205.606.

5 So we have two -- a petitioner that  
6 submitted this Ethiopian and Japonese pepper  
7 petitions, and then we have a more recent  
8 petition for tamarind seed gum which is under  
9 review, and a technical report is in development.

10 Okay, also of interest from the  
11 handling subcommittee at this meeting, there is a  
12 consideration of a reclassification of potassium  
13 acid tartrate. I think that came out of the last  
14 sunset review of this substance. So the decision  
15 would be whether to reclassify that substance  
16 from a synthetic substance to an agricultural  
17 substance.

18 There's also a discussion document on  
19 marine algae. That will not be voted on at this  
20 meeting. It's simply a discussion document, and  
21 the two verbal updates following from previous  
22 meetings included tocopherols and ancillary

1 substances in cellulose. And again, for the  
2 verbal updates, we won't have a vote at this  
3 meeting either.

4 Also of interest, we do have a new  
5 report available for bisphenol A (BPA), as a  
6 packaging substance, and again, that's posted on  
7 our website now. It was developed at the request  
8 of the handling subcommittee in response to a  
9 memo that NOP issued to the full board in 2014  
10 regarding packaging substances used in organic  
11 food handling. So it's not on the agenda for  
12 this meeting, but we do have the technical report  
13 available, which was a follow up to that memo.

14 Okay, so in terms of things that will  
15 be voted on at this meeting, for petitioned  
16 substances, there are generally two votes that  
17 will occur for each material.

18 That first motion is a classification  
19 motion for things that have not been previously  
20 classified by the board, and that typically is a  
21 motion to classify a material as either synthetic  
22 or nonsynthetic or agricultural or

1 nonagricultural.

2           Once a material has been classified,  
3 the board will take a second vote whether to  
4 list, remove, or amend the substance as  
5 applicable, and both of those motions do take a  
6 two-thirds majority in order to pass the full  
7 board, and that threshold of two-thirds is  
8 established under the statute in the Organic Food  
9 Production Act.

10           So with a board of 15 members here,  
11 that's 10 votes in order to pass either of those  
12 motions. If someone is late back from a break  
13 and there are only 14 members in the room, it's  
14 still 10 votes, so 10 for membership here.

15           We will have 35 substances up for  
16 sunset review to complete the sunset review at  
17 this meeting. Those materials are part of the  
18 sunset 2019 review, and it's 2019 because for  
19 materials that are recommended for removal, the  
20 program does need that time to complete any  
21 necessary rulemaking by the sunset deadline. So  
22 I won't go through the materials individually

1 right now, but you'll hear from me later tomorrow  
2 and the following day with the introductions for  
3 those materials.

4 So in terms of the sunset 2019, one  
5 caveat I did want to point out is that only one  
6 of those materials that are being reviewed is  
7 actually scheduled under the regulations to  
8 sunset in 2019, which is the biodegradable  
9 biobased mulch film.

10 The rest of those materials are being  
11 reviewed early as part of the board's  
12 recommendation from 2016 to reorganize the sunset  
13 review process, so in effect we're moving up the  
14 review of 34 of the materials in order to better  
15 balance the work load of the board under sunset.

16 Okay, so these sunset materials, they  
17 were all on the agenda for the spring 2017  
18 meeting, and again, this is the second meeting  
19 where the board will complete its review. For  
20 each of those materials, the board will take a  
21 motion to remove the substance, and again, that  
22 motion will take a two-thirds majority in order

1 to pass.

2 If you are interested in either these  
3 materials or future sunset materials, we did  
4 recently update the National List sunset date  
5 document which is available in the program  
6 handbook. That's NOP 5611, and that reflects all  
7 of the updates and changes that were made under  
8 the sunset 2017 process and is the most current  
9 resource for upcoming sunsets.

10 And just a quick preview on the sunset  
11 2020, which will start at the spring 2018  
12 meeting, there's a few more materials for next  
13 year, 52 listings that will be reviewed over the  
14 course of the following spring meetings next  
15 year. Again, six of those are actually scheduled  
16 to sunset in 2020. The remaining 46 are, again,  
17 under an early review as part of that NOSB  
18 recommendation to redistribute the workload for  
19 sunset.

20 Even though we haven't completed the  
21 sunset 2019 yet, we did ask the board over the  
22 summer to think about what technical reports they

1 might need in support of next year's sunset  
2 process. That's to give us enough time to do the  
3 contracting and technical report development to  
4 be ready for the spring 2018 meeting.

5 So as part of that review, we did ask  
6 the subcommittees to prioritize their technical  
7 reports. We were able to meet all of the, I  
8 guess, top priority requests and a few additional  
9 ones as well. This slide will be posted on our  
10 website, but just to give you a preview, that  
11 looks like seven, six reports that we'll be doing  
12 under sunset 2020.

13 I do want to point out just one in  
14 particular which is the gums report, which was  
15 requested for the handling subcommittee. So  
16 there are a number of gums on the National List.  
17 Not all of them are going to be under sunset  
18 review for 2020.

19 In consideration of the fact that gums  
20 are very often used for similar technical and  
21 functional effects, we did expand the scope of  
22 that report for gums so that it will cover all of

1 the gums on the National List, so it will include  
2 all of the water extracted gums that are on 606,  
3 but in addition, the other gums, tragacanth,  
4 xanthan, and gellan gum, I think, is the last  
5 one. So those reports will be coming soon. Once  
6 they're approved by the various subcommittees, we  
7 will post them online for the public.

8 I think this is my last slide. One  
9 update on the technical report contracts, as part  
10 of our normal business, we do have to update our  
11 technical report contract from time to time, so  
12 we did just reissue a technical report contract  
13 which will help with the support for the upcoming  
14 sunset reviews and petitions. That award was  
15 contract -- was awarded to two groups, the  
16 Nexight Group and Savan Group.

17 And I just want to point out one  
18 change that we did make for this new technical  
19 report contract in response to stakeholder  
20 feedback. We heard from various stakeholders  
21 about the disclosure of authors for the reports.  
22 Whereas in general, we have disclosed the

1 organization completing the report consistently,  
2 but not necessarily the individuals involved in  
3 the authorship. Under the new contract, we do  
4 have that mandatory requirement that the authors  
5 will be disclosed in the report.

6 So we're in a bit of a transition  
7 period right now, so everything being posted may  
8 not include that information if it wasn't done  
9 under the previous contract, but going forward  
10 under this new blanket purchase agreement, we  
11 will include authors, and that includes  
12 subcontractors as well.

13 And I think that is it, and if you  
14 have any questions, I'd be happy to answer them  
15 as well. Thanks.

16 MR. CHAPMAN: So quick question, you  
17 do have current contractors under contract that  
18 would be extending under the non-disclosure of  
19 authors contract?

20 DR. BRINES: There are a couple of  
21 reports that are wrapping up, nothing new that  
22 has been assigned recently. I believe the sodium

1 citrate report is under the old contract, and  
2 glycolic acid is under the old contract.

3 MR. CHAPMAN: And then those two were  
4 the totality of contracts, or those are just new  
5 contractors in addition to contractors already  
6 approved?

7 DR. BRINES: I see, yes, so this  
8 replaces an expiring contract, so this will be  
9 the two contractors going forward.

10 MR. CHAPMAN: Excellent, thank you.

11 DR. LEWIS: I'd like to turn to my  
12 colleague, Dr. Jenny Tucker, for some additional  
13 remarks.

14 DR. TUCKER: Okay, I came up here so  
15 we can acknowledge and recognize Lisa Brines for  
16 having won a big award within the National  
17 Organic Program, so this is a happy award moment.  
18 Lisa is the recipient of the NOP Employee of the  
19 Quarter award this last quarter.

20 Okay, so this is an award, again, it's  
21 a quarterly award, so it's issued each quarter.  
22 It's within NOP, and it is peer nominated, and so

1 a group of Lisa's peers nominated her for this  
2 award, and so she gets some goodies for that.

3 So first, there is a floating trophy  
4 that says USDA Organic and has a seal on it,  
5 "National Organic Program employee of the quarter  
6 in honor of your outstanding service," so she  
7 gets to keep this for the quarter, and then it  
8 gets passed to the next recipient next quarter,  
9 so there you go.

10 And then to keep, Lisa gets a -- it's  
11 a clock and pen holder, and for some reason, the  
12 pens weren't in the box, so I'll have to mail you  
13 the pens. I don't know how that works. It says,  
14 "National Organic Program Employee of the  
15 Quarter." It also has the seal on it, so she  
16 gets to keep this, so it's her keepsake for  
17 employee of the quarter.

18 And then no award would be complete  
19 without a plaque, of course, so here we go, and  
20 so here is the plaque. It says, "Certificate of  
21 Achievement. This certificate proudly recognizes  
22 Lisa M. Brines as employee of the quarter during

1 July, August, and September 2017 in honor of your  
2 outstanding performance and commitment to the  
3 Agricultural Marketing Service's National Organic  
4 Program's success."

5 We'll take formal pictures a little  
6 later. I do want to just say a couple of words.  
7 I think you all know how wonderful Lisa is, and  
8 so she has done tremendous work to really  
9 formalize and to explain, and to make more  
10 efficient the petition process.

11 She answers countless questions about  
12 the National List for stakeholders across the  
13 community, both long-term community members and  
14 new ones who are coming in. This technical  
15 report recompeete that she just mentioned, that  
16 was a huge project.

17 Government contracting is hard, and  
18 she really, really mastered that process and  
19 really took over from beginning to end really how  
20 to work that process and make it the success that  
21 it was, so that was a huge project, and Lisa, so  
22 grateful for everything, so thank you.

1                   MR. CHAPMAN: Thank you, Jenny.  
2                   That's an award that's well deserved. We  
3                   couldn't do our work without Dr. Brines' support,  
4                   and I think everyone on the board agrees with me  
5                   on that. Thank you so much, Lisa, for all your  
6                   help.

7                   All right, we will get onto public  
8                   comment now. To start public comment, I'm going  
9                   to go over a couple items from our policies and  
10                  procedures manual. Before I get into that, and  
11                  if we could pull up those slides, just a quick  
12                  reminder to silence your phones and computers. I  
13                  can hear someone getting a decent amount of email  
14                  out there, so please just remember to keep that  
15                  quiet so we can focus on the public comment and  
16                  questions from the board.

17                  All right, so public comment policy,  
18                  I'm not going to read this in detail. I'm just  
19                  going to go over some mechanics of it and some  
20                  important highlights, but first of all, the  
21                  public comment duration is three minutes.

22                  We have a handy colored timer and

1 buzzer there. Michelle, do you want to start it  
2 going? So it starts at green. It will go to  
3 yellow and red, and we'll just see that happen as  
4 I start talking, but the yellow light is a  
5 warning, and then the red light is when the time  
6 is up.

7           Once you see that red light, please  
8 finish your sentence and your thought, and out of  
9 respect for the board and other public  
10 commenters, I ask that you respect the time limit  
11 and try to wrap it up as quickly as possible. At  
12 that time, I will ask the board members if they  
13 have any questions for the presenter.

14           If you have a presentation to go along  
15 with it and have provided that Michelle, she will  
16 have it loaded up, and there is a remote that you  
17 can use to move the slides forward. Michelle is  
18 modeling it at this time.

19           I will be asking everyone to start  
20 their comments by stating their name and  
21 affiliation for the record. We ask that you  
22 disclose all relevant affiliations pertaining to

1 matters of business before the board. If members  
2 of the board want further clarification, I  
3 encourage you to ask questions after the comment  
4 has been given.

5 I will be asking for commenters' name  
6 and affiliation before each commenter to remind  
7 folks to start with that, and also to give you an  
8 opportunity to set the record straight if I've  
9 butchered your name, and I apologize for that in  
10 advance because I will most likely do that to  
11 some names.

12 A reminder that -- can we go to the  
13 second slide, Michelle? No proxies are allowed.  
14 Commenters should refrain from making personal  
15 attacks or remarks that might impugn the  
16 character of an individual. If I hear something  
17 of this nature, I will interrupt the commenter  
18 and ask them to refrain.

19 Please be clear and succinct. It is  
20 your three minutes to talk about whatever you  
21 wish, previous point notwithstanding, but just  
22 because you're able to speed read doesn't mean

1 we're able to speed listen, and that's the end of  
2 my advice and what's in our manual.

3 So with that, we'll get started with  
4 public comments. First up, I'll be reading the  
5 names and then the names of people on deck. If  
6 you're on deck, we have a chair over here for you  
7 to sit on so we can rapidly move through the  
8 public comment process given we're already about  
9 15 minutes behind.

10 So first up is Russell Taylor,  
11 followed by Jesse Maranville. Russell, are you  
12 here, and if you could start with your name and  
13 relevant affiliation?

14 MR. TAYLOR: Thank you. My name is  
15 Russell Taylor. I'm here today representing the  
16 Humic Products Trade Association as president.  
17 HPTA consists of 35 of the leading manufacturers  
18 in the humic product industry. I am also a  
19 committee member of the International Humic  
20 Substances Society, a committee of commercial and  
21 industrial applications on humic substances.

22 I have been in the humic acid

1 manufacturing business professionally for 20  
2 years, and more importantly, I'm a certified  
3 organic farmer who uses humic acids on my farm.  
4 My comments today represent those of many humic  
5 acid both -- in the industry, both domestically  
6 and internationally.

7           Because humic acids is functionally  
8 defined as being only soluble in an alkaline  
9 solution, a small amount of synthetic hydroxide  
10 is needed to refine these products. In past  
11 years, concerns with humic acid at the NOSB has  
12 always been around the nutrient fortification  
13 with a synthetic substance added to refine these  
14 products.

15           After reviewing the minutes of the  
16 NOSB meeting in Denver, several misconceptions  
17 regarding the manufacture of humic acids caught  
18 our attention. Typically, humic acids are used  
19 in small amounts as part of compost heaps, drip  
20 irrigation, and blended with other fertilizers.  
21 Humic acid needs to be soluble to be used in  
22 these applications.

1                   Humic acids can increase the  
2                   availability of micronutrients and facilitate  
3                   microbe activity. To assert these products as  
4                   being used a crutch by farmers illustrates a lack  
5                   of knowledge of how and why humic acids are used  
6                   by these producers. Just like kelp extracts,  
7                   humic acids are a tool that can help facilitate  
8                   crop growth.

9                   Also at the Denver meeting, comments  
10                  were made in the subcommittee using confusing  
11                  terms like "coal" and "naturally derived humic  
12                  acids." Additionally, the assertion was made  
13                  that coal for humic extraction diminishes the  
14                  amount of fossil fuels available for energy.

15                 Presently, humic acids are extracted  
16                 from terrestrial deposits such as leonardite,  
17                 oxidized lignite, bituminous coals, humalite,  
18                 carbonaceous shales, peat, and sapropel. All of  
19                 these naturally occurring deposits are ancient  
20                 plant deposits that have no commercial fuel  
21                 value.

22                   Conversely, humic acids are not

1 present in fuel type coals and cannot be  
2 extracted from fuel type coals unless coal is  
3 subjected to a chemical oxidative process which  
4 are not allowed by NOP. This fact was confirmed  
5 by a rigorous lab testing method done by AAPFCO  
6 which is the American Association of Plant Food  
7 Control Officials.

8 Because oxidative processes for humic  
9 acid are not allowed by NOP rule, making  
10 additional annotation or guidance for coal-  
11 derived humic acids is redundant. The suggestion  
12 that more natural-based materials should be used  
13 overlooks the fact that humic acid needs to be  
14 synthetically extracted regardless of the source.

15 The bulk of the liquefied humic acid  
16 soluble available to growers is made from  
17 immature and brown weathered coals as indicated  
18 previously. Removing them from the allowed  
19 sources in the humic substance extraction process  
20 would virtually eliminate all liquefied humic  
21 acid as an available ingredient to organic farms.

22 The current rule describing alkaline

1 extracted humic acid derived from naturally  
2 occurring deposits is correct and requires no  
3 revision or annotation.

4 MR. CHAPMAN: Thank you. Any  
5 questions? Thank you for your comments. Up next  
6 is Jesse Maranville followed by Theojary  
7 Crisantes. Sorry, Theo.

8 MR. MARANVILLE: Hello, I'm Jesse  
9 Maranville.

10 MR. CHAPMAN: Sorry, if you could  
11 start with your name and affiliation?

12 MR. MARANVILLE: I'm president of  
13 Georgia Gulf Sulfur Corporation. Sulfur today as  
14 we know it is all produced by the Claus process  
15 as opposed to the Frasch process, which was the  
16 mine material that happened in the 1900s.

17 Frasch processed sulfur typically was  
18 99 plus, however it had impurities including  
19 lead, selenium, tellurium. The processed sulfur  
20 we use today is 99.9 typical, has no impurities  
21 to speak of, 0.1 percent max.

22 It's also moved in molten tank cars

1 and trucks today as opposed to solid in the old  
2 days. We run our own tank trucks and bring it in  
3 that way.

4 We solidify it on a stainless steel  
5 drum. We store it in enclosed silos and bins,  
6 and then we take it to further processing.  
7 Further processing for us consists of milling it  
8 to a particle size, in the ag sulfur division  
9 about 35 microns.

10 We also add kaolin clay to it at this  
11 point to improve the flowability. The product is  
12 then packaged to a personal requirement of the  
13 customer, 50 pound bags, 30 pound bags, ton bags,  
14 whatever. It's never stored in bulk.

15 Elemental sulfur is environmentally  
16 safe. It's a very safe material, both as a raw  
17 material for handling, and as a finished product  
18 for the producer, I mean for the consumer, excuse  
19 me. Our ag products are both approved through  
20 NOP as well as OMRI for, again, production in  
21 crops.

22 It should be noted that target tests

1 for livestock are not really killed by the  
2 product, but actually repel for the most part.  
3 The exception to this is when it's in contact  
4 with pests that have exoskeletons that acts as  
5 diatomaceous earth in that respect.

6 At present, there are no known  
7 alternatives on the National List for livestock.  
8 A good use for this product is in poultry houses  
9 where it actually minimizes mites. If you  
10 minimize mites, you increase egg production,  
11 therefore it's just an economic benefit for the  
12 grower at a very minimal cost.

13 MR. CHAPMAN: Thank you.

14 MR. MARANVILLE: Questions?

15 MR. CHAPMAN: Any questions for Jesse?

16 Asa first and then Harriet.

17 MR. MARANVILLE: Harriet?

18 MR. CHAPMAN: Asa first.

19 MR. BRADMAN: Just a quick question.

20 When you package the material for applications to  
21 fields and poultry, is it in a dust form and is  
22 the application method by dust, or do you ever -

1 do you manufacture any wettable powders?

2 MR. MARANVILLE: It's actually - it's  
3 a duo label. You can apply it as a wettable or  
4 as a dust. You can dust it or spray it.

5 MS. BEHAR: Are there any respiratory  
6 issues when it's being used around livestock,  
7 poultry, or bovines, or anything?

8 MR. MARANVILLE: Not that we're aware  
9 of, no.

10 MS. OAKLEY: Sulfur is a known skin  
11 and eye irritant. Are there any concerns with  
12 applying it directly to animals with regards to  
13 their skin and eyes?

14 MR. MARANVILLE: I'm sorry, I didn't  
15 understand.

16 MS. OAKLEY: It's a skin and eye  
17 irritant. Are there any concerns applying it  
18 directly to livestock?

19 MR. MARANVILLE: No, actually we make  
20 another product that's a petroleum jelly-based  
21 product for skin problems for livestock. Most  
22 people won't dust livestock. They dust the

1       quarters just because it's easier and it's  
2       basically just as efficient, but there's no skin  
3       irritations that we know of.

4               MR. CHAPMAN: Thank you very much.

5               MR. MARANVILLE: Thank you.

6               MR. CHAPMAN: Up next is Theojury  
7       Crisantes followed by Peter Johnson. If you  
8       could start with your name and relevant  
9       affiliations for the record?

10              MR. CRISANTES: Hi, good afternoon,  
11       ladies and gentlemen. My name is Theojury  
12       Crisantes. I'm a grower at Wholesum Harvest. We  
13       grow organic vegetables in open fields, shade  
14       houses, greenhouses, both in the ground and in  
15       containers.

16              I would like to take this opportunity  
17       to comment on the crops committee proposal on  
18       hydroponics and container grown recommendations  
19       from August 29 of 2017, specifically the motion  
20       put forward that for container production to be  
21       certified organic, in which a limit of 20 percent  
22       of the plant nitrogen requirement can be supplied

1 by liquid feeding and a limit of 50 percent of  
2 the plant nitrogen requirement can be added to  
3 the container after the crop has been planted.

4 For perennials, the nitrogen feeding  
5 limit is calculated on an annual basis.

6 Transplants, ornamentals, herbs, sprouts, potter,  
7 and aquatic plants are exempted from these  
8 requirements.

9 It is my view that regardless of the  
10 production method used, fertility needs should be  
11 addressed by site-specific conditions determined  
12 by the grower in accordance with his or her  
13 organic system plan and to promote biodiversity.

14 I strongly disagree to use a formula  
15 of 20 percent of the plant's nitrogen  
16 requirements determined for sodium nitrate, a  
17 highly soluble input which is immediately  
18 available to the plant as a nutrient, and compare  
19 it to hydrolyzed soybean meal, which is neither  
20 highly soluble nor immediately available to the  
21 plant as a nutrient, and then create a rule for  
22 the fertility need of a plant that is

1 inconsistent.

2 This statement demonstrates the lack  
3 of understanding of the crops committee about the  
4 process necessary for organic container  
5 production which they are pretending to regulate  
6 which requires presence in the root zone of  
7 natural and diverse soil ecology which is  
8 essential for organic inputs to be available to  
9 the plant as nutrients.

10 Their correct focus in container plant  
11 nutrition should be on the natural and diverse  
12 soil ecology found in the container and not in  
13 the amount of one single element and how the  
14 element is delivered to the plant.

15 I would like to encourage the board to  
16 continue to work on the minority view which is  
17 based on the 2010 recommendation, specifically  
18 the 50 percent carbon-based media requirement  
19 which to me seems arbitrary and redundant if the  
20 requirement for a media is already defined as a  
21 growing media shall contain sufficient organic  
22 matter. Thank you. Any questions?

1 MR. CHAPMAN: Thank you. Questions?  
2 Joelle?

3 MS. MOSSO: Hi, and thank you for your  
4 comments. I just had a question. I understand  
5 that you don't agree with what's in the majority  
6 proposal, but my question is could you comply  
7 with it?

8 MR. CRISANTES: Yeah, I could comply,  
9 yes, yeah.

10 MS. MOSSO: What would be the limiting  
11 factors being most problematic within it?

12 MR. CRISANTES: Well, there would be,  
13 you know, quite a few limiting factors, one being  
14 for sure we would have a lot of runoff of that 50  
15 percent of that nutrient being already in the  
16 container. That would be, you know, the first  
17 one.

18 You feed the plant as they need to be  
19 fed, not, you know -- you don't feed your kids 50  
20 percent of what they need at once, correct? So  
21 it's the same thing with plants. So imagine that  
22 you're throwing away that, and so that would be

1 one of the things that would come into mind right  
2 away.

3 MS. MOSSO: Thank you.

4 DR. THICKE: Mr. Crisantes, in July  
5 you testified before the U.S. Senate Ag Committee  
6 on behalf of the Coalition for Sustainable  
7 Organics and said quote, "The Coalition would  
8 support efforts to empower USDA and NOP staff to  
9 actively participate in the researching,  
10 drafting, and analysis of formal recommendations,  
11 and prioritize NOP's agenda. Further, we  
12 strongly support an active role for industry  
13 involvement."

14 So what is the active role you are  
15 looking for from the industry, and why is it that  
16 you want to see more of the authority of the NOSB  
17 turned over to the USDA?

18 MR. CRISANTES: I would like for the  
19 USDA to have a more active role on what the board  
20 needs to -- on the agenda of the board, on what  
21 the board needs to really be looking at.

22 For example, we had a great example of

1 it today. We have, you know, something that's  
2 really hurting our industry, which is the  
3 fraudulent imports, and I think that's something  
4 that needs to be addressed really quick.

5 And I think that's something that we  
6 should be working at, and I think that's  
7 something that's coming from them and it's not  
8 something that we're talking among us here, so  
9 those are the things that I'm talking about.

10 Definitely the conversation needs to be including  
11 the industry, but it cannot be just industry  
12 driven. It needs to be a cooperation among  
13 everybody that's involved. Was that not  
14 satisfactory, sir?

15 DR. THICKE: I'm sorry?

16 MR. CRISANTES: Was that not  
17 satisfactory?

18 DR. THICKE: Probably not for me, but,  
19 you know.

20 MR. CHAPMAN: Thank you. Ashley?

21 MS. SWAFFAR: Theo, I'd just like to  
22 let you know that the NOP does approve our work

1 agenda items, so we as the board do not just come  
2 up with something to work on. We have to have it  
3 approved by the NOP.

4 We do submit suggestions of what we  
5 would like to work on, and then the program  
6 approves or doesn't approve it, and then in the  
7 case of hydroponics and container growing, the  
8 program actually asked us to further clarify  
9 this.

10 MR. CRISANTES: Correct.

11 MR. CHAPMAN: Thank you very much. Up  
12 next, we have Peter Johnson, followed by Melody  
13 Meyer. Peter, if you could start with your name  
14 and affiliation for the record?

15 MR. JOHNSON: Hi, my name is Pete  
16 Johnson. I have a farm called Pete's Greens in  
17 northern Vermont, 100 acres of organic produce,  
18 three acres of greenhouse production, and 200  
19 acres of cover crops for a big crop rotation that  
20 we run.

21 I started as a farmer as an eight-  
22 year-old. My mom encouraged me to grow some

1 pumpkins and sell them, and immediately, even as  
2 a kid, it was obvious that focusing on soil  
3 fertility and quality was an important part of  
4 success. I'm here to speak in favor of  
5 eliminated hydroponic organics.

6 I'm from Vermont. We have an educated  
7 and interested consumer base there, and we  
8 regularly hear from consumers who are very  
9 concerned about watering down organic standards,  
10 and the top of the list that we hear about is  
11 hydroponics.

12 I'm not personally at all opposed to  
13 hydroponic production. I think it's an  
14 interesting way to grow food, and in the scheme  
15 of how we produce food in this country and feed  
16 people, there's a whole, you know, wide range of  
17 quality and all those things, and I think quality  
18 hydroponic production is a good way to feed  
19 people.

20 I think that the difference between a  
21 properly run organic soil fertility farm and  
22 hydroponic production is really vast, and there

1 are two completely different production systems  
2 and they should be called different names.

3 There's lots of good things we could  
4 call organic, you know, hydroponic production,  
5 but certified organic is the gold standard.  
6 We're trying to keep it that way, and it means a  
7 lot to a lot of people.

8 We have been, you know, humans have  
9 been farming now for 10,000 years, and that has  
10 been soil based. That's what people expect.  
11 That's what people think they're dealing with  
12 when they buy certified organic. They expect a  
13 natural system using natural biological factors,  
14 and, you know, I don't farm --

15 You know, I don't use soil biology to  
16 help fertilize my crops just because I believe in  
17 that. The standards require that. I can only  
18 use certain fertility products, most of which  
19 require some biological activity in order to be  
20 accessible to my crops.

21 So it's in the heart of the program  
22 and has been from the start, and it's really

1 important that we keep these standards and  
2 continue to have the integrity of USDA organic as  
3 we move forward because people care. People are  
4 interested.

5 It matters, and it's really going to  
6 matter in the coming years. And we appreciate  
7 your work, and I hope that you look at this very  
8 seriously. Thank you.

9 MR. CHAPMAN: Ashley, then Steve.

10 MS. SWAFFAR: So you talked a little  
11 bit about labeling. Would you be opposed if  
12 hydroponic folks used the USDA still, but just  
13 underneath it said, "hydroponically grown?"

14 MR. JOHNSON: I think that's a  
15 slippery slope. There's a lot of information out  
16 there in the world, and people don't -- you know,  
17 consumers don't see everything and it's hard to  
18 -- I would be opposed to that, yeah.

19 I think that we have a label for  
20 organic that does still really mean something,  
21 and it's really hard to educate people about all  
22 of the different parameters, the different kinds

1 of production, and I'd prefer a different label  
2 for hydroponic.

3 MR. CHAPMAN: Steve?

4 MR. ELA: You mentioned you had  
5 several acres of greenhouse production. Is that  
6 for more than just transplants?

7 MR. JOHNSON: Yes, it's mostly soil  
8 grown vegetables.

9 MR. ELA: And how do you fertilize  
10 that?

11 MR. JOHNSON: Mostly compost, lots of  
12 different rock minerals and things, but it's the  
13 same story there that I need the soil biology to  
14 produce the nutrients from the crops, and it's  
15 not easy.

16 It's a complicated system, and  
17 sometimes you can't respond as quickly as you'd  
18 like to to a crop nutrient need, but that's part  
19 of being an organic farmer and going down that  
20 path, and learning those processes and working  
21 with the biology.

22 MR. CHAPMAN: Harriet, then Emily.

1 MS. BEHAR: What percentage of your  
2 fertility costs do you think you have -- you  
3 know, in your overall costs -- what percentage is  
4 the fertility inputs?

5 MR. JOHNSON: On my farm, it's about  
6 two and a half to three percent. We use a lot of  
7 organic chicken manure that we apply during the  
8 cover cropping period. I have three times as  
9 much land as I grow vegetables on, and cover  
10 cropping and bulk manure fertility is a huge part  
11 of our program.

12 And basically when I get around to  
13 growing vegetables in a piece of ground, that's  
14 sort of the test of the previous two years of  
15 preparation, and it's highly successful. It  
16 takes a lot of forethought, but my input prices  
17 are quite low, so it does work out financially.

18 MS. OAKLEY: At previous meetings, we  
19 have heard from public commenters that consumers  
20 just consider organic to be about no synthetic  
21 fertilizers or pesticides and no GMOs, but you  
22 said you have an educated consumer base. I was

1 wondering if you feel your consumers share those  
2 views, or if you see that they care about a  
3 broader host of issues behind the organic label  
4 like biodiversity, etcetera?

5 MR. JOHNSON: Well, it's some of both.  
6 Of course it's a huge, broad spectrum, but in  
7 Vermont, we do have a very educated consumer  
8 base, and there is a large component of our  
9 customer base that understands this issue and  
10 cares about soil in soil production. I don't  
11 know that that's the case everywhere.

12 I suspect that in a lot of places, not  
13 having chemicals on the food is probably the  
14 number one priority, as it probably is for me as  
15 well, but as you know, this issue has gotten a  
16 lot of attention in the past two or three years  
17 and it's not going to go away, and I think that  
18 this is going to be a better and better known  
19 issue, and as it is, it becomes sort of more and  
20 more controversial in ways that are not good for  
21 the organic label.

22 MR. CHAPMAN: Sue?

1 MS. BAIRD: In your fields, I'm  
2 assuming that you would use soil tests to  
3 determine the micronutrients that you would need,  
4 and you said you use composted chicken litter, is  
5 that correct?

6 MR. JOHNSON: Mm-hmm.

7 MS. BAIRD: And then in your  
8 greenhouses, I'm assuming you use the same type  
9 of inputs, correct?

10 MR. JOHNSON: Similar, you know,  
11 different levels of course, but, yeah.

12 MS. BAIRD: Well, sure, depending on  
13 what it needs.

14 MR. JOHNSON: Sure.

15 MS. BAIRD: Are all of those inputs  
16 dry or are some of them liquefied?

17 MR. JOHNSON: We have used fish  
18 emulsion, for example, in our drip irrigation,  
19 but we -- actually, we find that the inputs that  
20 we use dry are less expensive typically per  
21 nutrient value, and we've gotten pretty good at  
22 predicting the needs of the crop through the

1 season.

2 Like I say, it's not perfect. It's an  
3 art. It's partly science, but it's also an art.  
4 Weather extremes can adjust those things. And I  
5 think that's another part of this issue too is  
6 that, you know, soil grown organic production is  
7 difficult, and it may be more difficult in some  
8 ways to create yields that could be created  
9 hydroponically, and so there could be a bit of an  
10 unfair playing field here and that matters as  
11 well, especially if we have a consumer base that  
12 actually wants what we're producing, but not  
13 everybody understands the situation.

14 MS. BAIRD: And I totally agree with  
15 you, very difficult. Do you have drip lines?

16 MR. JOHNSON: Yes.

17 MS. BAIRD: And do you run any kind of  
18 inputs through those drip lines?

19 MR. JOHNSON: Occasionally fish  
20 emulsion, seaweed, that sort of thing, but not at  
21 all the bulk nutrient needs of the crop.

22 MR. CHAPMAN: Okay, I'm going to do

1 one more, and then I'll stop it there because we  
2 need to move on. Joelle?

3 MS. MOSSO: It's a quick one. In your  
4 greenhouse soil-grown operation, do you do crop  
5 rotation or how do you address crop rotation or  
6 cover crop?

7 MR. JOHNSON: We don't cover crop much  
8 in the greenhouses, a little bit here and there,  
9 but the space is too valuable, so big rotation  
10 and heavy doses of compost seem to really help  
11 with the sort of issues that you might, you know,  
12 encounter in outdoor production if you didn't  
13 crop rotate, a lot of biological pest control,  
14 beneficials, a lot of attention paid to all of  
15 that because it's a highly diversified  
16 environment.

17 In some ways, I think it's easier to  
18 grow one crop in a greenhouse and keep it all  
19 closed up, but we're growing 50 crops in three  
20 acres of greenhouses, so we've learned a lot  
21 about how to use beneficials and things like  
22 that, and that too, imperfect, but a constant

1 learning challenge.

2 MS. MOSSO: Thank you.

3 MR. CHAPMAN: Thank you, Peter.

4 MR. JOHNSON: Thanks.

5 MR. CHAPMAN: Up next, we have Melody  
6 Meyer, followed by Justin Rich. We're about 25  
7 minutes behind schedule now. Melody, if you  
8 could start with your name and affiliation?

9 MS. MEYER: Hi, I'm Melody Meyer. I'm  
10 with UNFI policy and industry relations. I'm  
11 also the executive director of the UNFI  
12 Foundation. I sit on the California Organic  
13 Products Advisory Committee, and I'm a trustee at  
14 The Organic Center. I'm no longer on the board  
15 of the OTA.

16 I want to thank you all for your  
17 tireless work, all the hours that you've put in,  
18 and your commitment to the organic process. I  
19 know it's a lot of work and I appreciate it.

20 I'm going to comment on a few things.  
21 Regarding the proposal to strengthen and clarify  
22 organic seed use requirements, I agree with OTA's

1 position that some changes need to be made before  
2 the proposal is passed.

3           Until a seed purity standard is  
4 developed, I urge you to simply clarify that non-  
5 organic seed must be commercially available in  
6 organic form and produced without excluded  
7 methods.

8           Regarding the proposal for hydroponic  
9 and container growing, I'm in support of the  
10 proposed standards that CCOF has developed for  
11 all types of soilless growing conditions or  
12 systems. Instead of focusing on inputs as the  
13 defining characteristics of various production  
14 system, the NOSB should focus more on the  
15 outcomes.

16           Minimum soil biology diversity should  
17 be applied to all container and hydroponic  
18 systems and all systems to ensure that soil  
19 biology remains an essential element of all  
20 organic systems. Selecting a one-size-fits-all  
21 strategy will not work for all crops and  
22 commodities.

1           UNFI supports separate labeling if  
2           done in such a way that simply adds a line  
3           beneath the name of the certification company and  
4           does not require a new UPC or PLU code. This  
5           would not disrupt commerce, and it would give the  
6           small fraction of consumers that care about soil  
7           the information that they need.

8           It's important that we take a  
9           sensible, balanced approach. We do need to find  
10          a solution. If NOSB cannot agree, we end up with  
11          nothing, nothing more than a haphazard mix of  
12          earlier recommendations and positions that are  
13          both unclear and insufficient to recognize the  
14          major changes that have occurred in organic  
15          production since OFPA was written.

16          I'm going to speak on eliminating the  
17          incentive to convert native ecosystems. I've  
18          come up here and mentioned this many times, so I  
19          really want to thank you for the recommendation.  
20          I would urge you to send this proposal back to  
21          committee to address a few details.

22          The term "native ecosystem" is yet

1 undefined, and the definition as proposed by Wild  
2 Farm Alliance provides a basis for understanding  
3 the types of ecosystems that this policy is  
4 striving to protect. It offers a basis for a  
5 practical verification method based on elements  
6 that are easily observable.

7           Regarding your research priorities,  
8 thank you for the inclusion of priorities related  
9 to plant disease management and the development  
10 of alternatives for materials on the National  
11 List. That's a really important thing.

12           As a trustee of The Organic Center, I  
13 echo their suggestions to consider biodiversity  
14 and the efficacy of practices as a topic for  
15 inclusion in your 2018 research priorities. I  
16 think this is especially relevant as the NOP's  
17 new biodiversity and resource conservation guide  
18 comes online. Thank you very much.

19           MR. CHAPMAN: Thank you. Any  
20 questions? Emily?

21           MS. OAKLEY: Could you elaborate a  
22 little bit on this new research topic of

1 biodiversity? I thought I understood from the  
2 webinar that the concern was that by increasing  
3 biodiversity on the farm, you were also  
4 increasing crop loss, so I wasn't entirely sure  
5 if I understood that correctly or what it was  
6 that the research you are suggesting should look  
7 at?

8 MS. MEYER: Just to consider the  
9 efficacy of different practices that are  
10 happening and how that affects biodiversity.

11 MR. CHAPMAN: Thank you very much.

12 MS. MEYER: Thank you.

13 MR. CHAPMAN: Up next is Justin Rich,  
14 followed by Mary-Scott Standish. Justin, is  
15 there a Justin here? All right, no Justin.  
16 Mary-Scott Standish, is that you walking up? All  
17 right, sorry to put you straight on the hot seat.  
18 You're up next, followed by Esteban Macias. If  
19 you could start with your name and affiliation  
20 for the record?

21 MS. STANDISH: Can you see me above  
22 the podium? Okay, I am Mary-Scott Standish from

1 Fresh2o Growers. Thank you to the board for your  
2 time. I would like to address the crop  
3 subcommittee proposal concerning hydroponics and  
4 container growing.

5 Fresh2o Growers is a certified organic  
6 hydroponic grower of lettuces and herbs located  
7 in Virginia. We are a family-owned and operated  
8 small business which employs 30 full time office  
9 and greenhouse staff.

10 Our owner, Joe Van Wingerden, has over  
11 40 years experience in the greenhouse industry.  
12 It was on a mission project in Haiti that he  
13 first experienced growing produce organically.  
14 The people there needed a sustainable method to  
15 produce food, and there was no available  
16 fertilizer, so they had to source organic  
17 fertilizer locally.

18 He took that knowledge and experience  
19 back to the United States and decided to start an  
20 organic lettuce company. That is the mission of  
21 Fresh2o Growers: to grow more organic produce in  
22 a sustainable way. Our goal is to feed the

1 future the freshest, healthiest, and most  
2 nutritious produce possible while preserving our  
3 environment.

4           If the definition of hydroponics is  
5 changed to be defined as any container production  
6 system that does not meet the standard of a limit  
7 of 20 percent of the plant's nitrogen requirement  
8 being supplied by liquid feeding, and a limit of  
9 50 percent of the plant's nitrogen requirement  
10 being added to the container after the crop has  
11 been planted, it will take away our organic  
12 certification and give field growers an unfair  
13 advantage.

14           First, plants do not take up dry  
15 fertilizer. They only take up liquid fertilizer.  
16 However, we do not use liquid fertilizers. We  
17 use the same dry fertilizers as field growers,  
18 and we dissolve the dry fertilizer in water.

19           Field growers do the same thing. The  
20 only difference is their fertilizer is dissolved  
21 when it rains. We control that part of the  
22 process better than they do. We use the same

1 fertilizers, except our use is targeted.

2 Therefore, there is no waste and no runoff.

3 I think it is important to point out  
4 that our greenhouse is located within the  
5 Chesapeake Bay watershed. There is a great  
6 concern in the Chesapeake Bay watershed over the  
7 runoff from the agriculture because Chesapeake  
8 Bay is literally being poisoned by the  
9 fertilizers applied to the landscape, which is  
10 then carried off into the bay by runoff.

11 Secondly, our substrate is organic  
12 dirt. We use organic dirt and then we transplant  
13 into water, and when we transplant, our substrate  
14 is water. We add dry fertilizer to our substrate  
15 just like field growers. All of our fertilizer  
16 is already in our substrate, which is the water,  
17 when the crop is planted.

18 Lastly, field growers use more  
19 fertilizer per plant than we do. This rule  
20 allows organic field growers to use as much  
21 fertilizer as they want. The plant will use up  
22 only what it needs, and the rest of the

1 fertilizer goes into the dirt, feeds weeds, or  
2 runs off to pollute water sources.

3 The fertilizer we use in our substrate  
4 is used exclusively by the crop, and we use far  
5 less than 20 percent of what field growers use.

6 These three points illustrate how  
7 prejudiced this new definition of organic growing  
8 is. This will give field growers the only right  
9 to produce certified organic products.

10 I urge the NOSB to support modern,  
11 cleaner, and more sustainable and healthier  
12 methods of growing by supporting certified  
13 organic hydroponics, aquaponics, and container  
14 growing. Thank you.

15 MS. SWAFFAR: Thank you for your  
16 comments. Any questions? Asa?

17 MR. BRADMAN: I had a question. You  
18 said you use solid fertilizers and dissolve them  
19 in water, so are you making, like, compost teas,  
20 or what are the specific fertilizers that you're  
21 using, and how are you dissolving them, and then  
22 how are you delivering that to the plant?

1 MS. STANDISH: We use all OMRI and NOP  
2 approved dry fertilizers that are soluble in  
3 water. Our mix is a propriety mix of dry  
4 fertilizers, but the same as you would see in the  
5 field applications, but we're just dissolving  
6 them first and putting them into the substrate.  
7 Yes?

8 MS. SWAFFAR: Steve, you had your hand  
9 up first.

10 MR. ELA: So I saw in your comment and  
11 a number of public comments about the Chesapeake  
12 Bay area, which we all know has had serious  
13 problems, but are organic soil grown growers  
14 there contributing to that problem as well?

15 I mean, it seems like we're kind of  
16 comparing apples and oranges in that and, you  
17 know, my sense is most organic growers are  
18 controlling that phosphorus nutrient, you know,  
19 nitrate runoff through their growing methods. So  
20 do you know in that area, are the organic growers  
21 also contributing to that problem?

22 MS. STANDISH: I do know that there's

1 a small percentage of organic field growers in  
2 the state of Virginia. It's mostly conventional  
3 farming in the state of Virginia when it comes to  
4 field grown, so I don't know what you would  
5 consider, if there is data on the percentages of  
6 organic versus conventional that are contributing  
7 to the problem.

8 But what is a problem is that there  
9 are so many parts of the country that do not have  
10 the climate and weather that would allow for so  
11 many crops to be planted, so we're trying to  
12 contribute to our neck of the woods by growing  
13 something indoors that is not readily available  
14 year-round in our area of the country.

15 MR. MORTENSEN: Just to set the record  
16 straight on the fertility issue in the Chesapeake  
17 Bay region, that's an area that I work in  
18 specifically. About 40 percent of the  
19 phosphorous loading in the Chesapeake is from  
20 human waste from sewage, and the other 60 percent  
21 is attributed about 99 percent to conventionally  
22 produced corn in the region.

1                   So organic farming in the region is  
2 considered not a contributor to the Chesapeake  
3 Bay problem mainly because of the diversity of  
4 crops on the ground and the use of cover  
5 cropping.

6                   MS. SWAFFAR: Harriet?

7                   MS. BEHAR: I know you said your  
8 fertilizers are proprietary, but could you just  
9 tell us what the actual sources are? We don't  
10 need to know the percentages, but are they manure  
11 based? Are they hydrolyzed --

12                   MS. STANDISH: No, we --

13                   MS. BEHAR: -- soy based, or  
14 hydrolyzed soybean meal based, or sodium nitrate?  
15 I mean, what are some, like, the nitrogen and the  
16 phosphorus sources?

17                   MS. STANDISH: So we do use nitrogen  
18 from fish emulsion, not necessarily directly on  
19 the crop, but just as a source into our nutrient  
20 mix, and then we use other dry fertilizers that  
21 we bring in from our organic supplier.

22                   MS. BEHAR: So is fish emulsion your

1 main source of nitrogen?

2 MS. STANDISH: Our main source of  
3 nitrogen is fish emulsion.

4 MS. SWAFFAR: Thank you. Tom says no.

5 MR. CHAPMAN: If it's quick.

6 MS. OAKLEY: It's really quick. I  
7 just wanted to make a point of clarification  
8 because I've heard this through the webinar,  
9 public comments, and here, that the intention  
10 behind the 50 percent requirement in the  
11 container was not that people load the containers  
12 with dry, soluble fertilizers before planting,  
13 but that they contain a substantial amount of  
14 compost and/or soil from which the plants would  
15 derive their nutrients.

16 So there wasn't an intent that there  
17 be leaching as a result of that, that the plants  
18 would be getting materials or nutrients from the  
19 compost and soil, so just a point of  
20 clarification.

21 MR. CHAPMAN: Thank you very much.

22 MS. STANDISH: Thank you.

1                   MR. CHAPMAN: Up next is Esteban,  
2 followed by Urvashi Rangan. Esteban, if you  
3 could start with your name and affiliation for  
4 the record?

5                   MR. MACIAS: Thank you. My name is  
6 Esteban Macias. I'm an agricultural engineer,  
7 and I have a master's degree in horticultural  
8 production. I work for a Mexican-based company  
9 named Grupo U. We are vegetable growers, and  
10 organics are about eight percent of our total  
11 production.

12                   We are doing production in containers  
13 in hot houses, and, well, we've been doing it now  
14 for 12 years. I believe we were one of the very  
15 first operations that actually started doing it  
16 this way, and we actually started with trials in  
17 soil and different production systems.

18                   So we had to make some decisions here  
19 and for us, the technical solution to several  
20 problems we had was the use of containers. Our  
21 water quality and our soil quality were quite not  
22 very good. We had a lot of salinity problems.

1           We had the option of trying to improve  
2           that by using extra water to leach the salts and  
3           do some organic amendments to improve everything,  
4           but in the end, our region is a semi-desert area.

5           We have a very limited amount of  
6           water. We actually do harvest all the water that  
7           falls for our greenhouses to be used on the  
8           fields. So the solution for us, the technical  
9           solution was to work on containers.

10           We came across that was also the best  
11           solution for using nutrients. Over the last  
12           years, organic fertilizer prices have skyrocketed  
13           almost triple. So our container systems are very  
14           efficient by placing the fertilizer, a little bit  
15           of it at a time.

16           I actually made a study with my  
17           technical staff and this was actually placing  
18           organic fertilizer, several different sources.  
19           So we used fish meal. We used soybean meal. We  
20           used soy-based bean meal, different materials we  
21           had at the time on our hands.

22           We placed them on containers with

1 soil, with actual soil, and we started irrigating  
2 every week, and collecting and analyzing the  
3 nutrients that leach from that. So we actually  
4 found for every element how they were behaving,  
5 and nitrogen, specifically nitrogen, once you  
6 reach the day number 15, it's all released by the  
7 microbes and then it starts dropping.

8 So if we were placing 50 percent of  
9 our nitrogen, our fertilizer just at once, after  
10 15 days, it will be released, I mean, will be  
11 lost either by denitrification as ammonia, but  
12 most of it will be eaten by the plant.

13 Plant relation with nitrogen is my  
14 relation with chocolate. It doesn't have enough,  
15 so it will take it, and that will not be very  
16 good.

17 MR. CHAPMAN: Thank you. Any  
18 questions?

19 DR. THICKE: Was that in a water  
20 system? This is in a water-based system?

21 MR. MACIAS: No, we are working  
22 actually a core mixture with compost, and

1 minerals, and fish meal, and other stuff, so --

2 DR. THICKE: Okay, so perhaps if you  
3 had some of the soluble or labile materials, plus  
4 some more less labile materials, you could have a  
5 different curve if they're mixed together  
6 perhaps, right?

7 MR. MACIAS: Yeah, yeah, we start with  
8 the nutrition on the substrate, but we tend to  
9 keep it on a small amount in the very beginning  
10 and then keep on adding. Actually, we add the  
11 fish meal and we add the chicken pellets on each  
12 container under the dripper to make sure it then  
13 decomposes by the microbes.

14 MR. ELA: I'm curious when you water,  
15 do you have water going through the containers  
16 and coming out the bottom, and if so, how do you  
17 collect that and what do you do with that?

18 MR. MACIAS: Okay, the container's got  
19 a dripper on top of it, so we actually drip  
20 irrigate each container, and then the containers  
21 are on top of rigs, bands, so the water goes down  
22 and then it's collected to be placed on our

1 server, and then mixed with fresh water with less  
2 salt and used for open field production.

3 MR. CHAPMAN: Thank you.

4 MR. MACIAS: You're welcome.

5 MR. CHAPMAN: Up next is Urvashi,  
6 followed by Marian Blom. Urvashi, if you could  
7 start with your name and affiliation?

8 MS. RANGAN: Thank you. My name is  
9 Urvashi Rangan. I represent U R Consulting.  
10 It's my own business. I previously spent 17  
11 years running safety and sustainability at  
12 Consumer Reports running test projects, label  
13 ratings, and national surveys on foods, and I've  
14 been to a lot of these NOSB meetings over the  
15 years. I'm really happy to be here again.

16 As a toxicologist who has also been a  
17 consumer advocate, I know how important it is to  
18 consider the science in the context of the policy  
19 work that you're doing, and making sure that the  
20 OFPA -- which seems like a long time ago -- is  
21 always top of mind in terms of what the intention  
22 and the spirit of what we're all doing here

1 really is.

2 I have lately -- I also wanted, Emily,  
3 to address your question on what consumers want.  
4 There is survey data out there. Surveys are a  
5 science. They're not phone calls, and I would  
6 highly encourage you not to rely on phone calls  
7 as a basis for making decisions, but rather ask  
8 the questions and ask them in a scientific way so  
9 that you can truly get the answers that you want.

10 These days, I've been spending a lot  
11 of time consulting to the sustainable agriculture  
12 foundation world, and I wanted to bring a little  
13 bit of that perspective into this meeting because  
14 it's really important for you to understand where  
15 the outer world is in terms of funding and  
16 sustainable agriculture. So Michelle, could you  
17 bring that up?

18 Steve Etko has coined this my  
19 eccentric concentric circle, but it is meant to  
20 talk about the big word out there "regenerative."  
21 The funders that I work for are incredibly  
22 interested in regenerative systems, and one thing

1 that I'm reminding these funders, some who are  
2 new in this space, some who have been there a  
3 long time, is that organic is a central part of  
4 what regenerative is.

5 There are label programs out there  
6 running that are going to launch without an  
7 organic piece attached to it, and that is going  
8 to undermine the organic program and organic  
9 products in the marketplace.

10 So it's incredibly important that all  
11 of us in the room understand that organic is not  
12 just central to regenerative, but it's the solid  
13 foundation underneath it.

14 And to the degree that integrity and  
15 continuous improvement needs to be maintained, in  
16 order to make sure that that little blue circle  
17 stays strong and maybe starts to incorporate some  
18 of the other things around it that are  
19 appropriate in terms of continuous improvement  
20 for organic, that's what it needs to be.

21 Hydroponics, in my opinion, does not  
22 fit these principles of biodiversity as soil

1 health of regenerating topsoil that are frankly  
2 part of the foundation of the OFPA. It's not  
3 that it doesn't have value, but they should call  
4 it something else, and USDA should come up with a  
5 program for them so that they can express what  
6 the benefits of their production practices are,  
7 but they're not organic.

8 Organic's really part of the soil  
9 system, and it's part of a regenerative system  
10 which goes even beyond organic, and labels are  
11 going beyond that now, and it really behooves the  
12 committee to look at that to see where continuous  
13 improvement is necessary. Thank you.

14 MS. BEHAR: So just to be clear, do  
15 you feel that hydroponic is a regenerative  
16 system?

17 MS. RANGAN: No, when we're talking  
18 about biodiversity, we're talking about building  
19 topsoil, which is an incredibly important topic.  
20 We're losing topsoil. When we talk about  
21 microbiology in the soil, these are all things --  
22 you can't build biodiversity in a hydroponic

1 system. You can't achieve these goals.

2 Again, this isn't to denigrate  
3 hydroponic systems. It's just to say you're  
4 calling an orange an apple, and it's not, and so  
5 call it something that consumers can understand.  
6 Make it really clear.

7 Create boundaries around it, and  
8 market the product as it is, and that's what that  
9 industry should be doing rather than trying to  
10 sort of piggyback on this, and then create what I  
11 think will be likely consumer confusion as to,  
12 "Why is this labeled organic, and that isn't?"  
13 and to the many comments you already hear about  
14 consumers feeling that the standard may be  
15 getting watered down.

16 DR. SEITZ: Do you have any  
17 information on how carbon sequestration compares  
18 between soil-based agriculture and hydroponics?

19 MS. SMITH: I'm sorry, can you ask  
20 that question again?

21 DR. SEITZ: Do you have any information  
22 on how the sequestration of carbon compares

1 between organic soil-based agriculture and other  
2 kinds?

3 MS. SMITH: Yes, I don't have that  
4 information; I think that's really good  
5 information for you all to ask for, and perhaps  
6 Rodale has that information, and Jeff can bring  
7 that to your attention.

8 But the fact of the matter is, you  
9 can't improve biodiversity or topsoil or  
10 microbiology, per se, in a hydroponic system.  
11 That's more of starting with a sterile system,  
12 making sure it doesn't get contaminated; putting  
13 a lot of inputs into it in a controlled way.

14 But that's what that is; it's not  
15 exactly what we think of when you read the OFPA  
16 as an organic farm production system in soil.

17 CHAIRMAN CHAPMAN: Thank you.

18 MS. SMITH: Thanks.

19 CHAIRMAN CHAPMAN: Up next, Marian  
20 Blom, followed by Jim Fullmer, and you can start  
21 with your name and affiliation for the record.

22 MS. BLOM: My name is Marian Blom, and

1 I represent the organic farmers and industry in  
2 the Netherlands, and I speak here on behalf of  
3 IFOAM EU, the organic umbrella organization  
4 uniting farmers, processors, traders,  
5 researchers, and certifiers.

6 My comment is relevant for the crops  
7 subcommittee proposal on hydroponics and  
8 container growing.

9 So there are three reasons why I  
10 traveled 20 hours times two to give this three-  
11 minute comment: firstly, I want to convince you  
12 not to underestimate the importance of your  
13 decisions for us.

14 If the NOP will allow hydroponic and  
15 aquaponic operations, the conventional growers in  
16 the EU will use this to put even more pressure on  
17 the European organic groups, and this may lead to  
18 the conversion of at least 1,700 acres to organic  
19 hydroponic cultivation in my country, the  
20 Netherlands, alone, at the expense of organic  
21 soil-based cultivation.

22 By the way -- and this is the second

1 reason why I'm here -- such a decision would be  
2 quite contrary to the policy of the European  
3 Union, so please allow me to update you on the EU  
4 rules.

5           There is, at this moment, a political  
6 agreement that above-soil production will be  
7 forbidden by 2030, which is actually not such a  
8 big deal, as currently, only on 50 of the  
9 approximately 13,000 acres of European organic  
10 greenhouses are these so-called raised beds  
11 allowed.

12           It's a practice that's limited to  
13 Sweden, Finland, and Denmark, and contrary to  
14 what you may think, organic hydroponic production  
15 is not allowed in the Netherlands.

16           So in other words, the European  
17 institutions adhere to the principle of soil-  
18 related crop production; organic crops produced  
19 in living soil in connection with the subsoil and  
20 bedrock, and with exceptions well defined, like  
21 epiphytes, seedlings, sprouts, chicory heads,  
22 ornamentals, and herbs.

1           This brings me to the third and final  
2 reason of my presence here. The strengthening of  
3 soil-related crop production is an outcome of the  
4 revision of the European law for organic  
5 production, a revision conserving energy and  
6 money, and it has lasted already for five years.

7           The European Commission proclaimed its  
8 revision because Europe, in their view, needs  
9 simple rules, close to the principles of organic  
10 farming. This -- and we agree with that -- is  
11 the only way consumers will keep trusting the  
12 logo and continue buying organic products.

13           That is a consideration we would  
14 recommend strongly to the NOSB. Thank you very  
15 much.

16           DR. THICKE: Point of order, Tom. I  
17 think you should say the name, because the  
18 transcriber will have to know who is speaking  
19 when they write it up.

20           CHAIRMAN CHAPMAN: They have info from  
21 the microphones, but we'll start with Steve.

22           Mr. ELA: Thanks. I'm curious what --

1 and to kind of follow up on the question Dan  
2 asked the previous speaker about the role of  
3 carbon sequestration in organic agriculture in  
4 the soils, and how that plays in your thinking,  
5 or in your systems.

6 I mean, is carbon sequestration a  
7 goal, and do your systems promote that?

8 MS. BLOM: Yes. Carbon sequestration  
9 is very much debated at this moment in the whole  
10 of Europe because of the Paris agreement, the  
11 climate agreement, and it's been put into  
12 national policies.

13 So every production system is trying  
14 to improve their methods to allow for more carbon  
15 sequestration.

16 However, I have not seen a comparison  
17 between different greenhouse systems, if that is  
18 what you mean. So I don't know if this  
19 comparison on carbon sequestration has been done.

20 CHAIRMAN CHAPMAN: Harriet.

21 MS. BEHAR: So you said there was  
22 1,700 acres of conventional hydroponics in the

1 Netherlands. Is it a robust market, and  
2 consumers are accepting a hydroponic label  
3 without an extra organic -- they're economically  
4 viable operations, or not?

5 MS. BLOM: Thank you for the question.  
6 Maybe I should make myself more clear -- I'm  
7 trying to convert into acres now. There are  
8 about 10,000 hectares in conventional  
9 greenhouses, and they're all hydroponic.

10 And of this, there is a forefront of  
11 companies who have expressed a wish to become  
12 organic hydroponic, and these are the 1,700 acres  
13 I mentioned.

14 But as such, the greenhouse products  
15 that are produced in the Netherlands, the  
16 conventional ones, they are very well accepted.  
17 But they are not specifically labeled as  
18 hydroponic or anything; they're just coming from  
19 a greenhouse.

20 CHAIRMAN CHAPMAN: Emily?

21 MS. OAKLEY: The Leaf system, or the  
22 practice behind in-the-ground, in-the-soil

1 production; would you say that's driven by  
2 consumers or producers, or a combination of the  
3 two in the European Union?

4 MS. BLOM: Well, it comes from more  
5 sites. The discussion I'm very much involved  
6 with comes from the producer site. They see the  
7 added value of an in-soil production in  
8 greenhouses, because it's already -- to say it  
9 quite honestly, it is quite an artificial system.

10 You already have a roof over your  
11 head. So the soil is what keeps the organic  
12 greenhouse producers connected with the rest of  
13 the organic producers, which makes it truly a  
14 fundamental principle.

15 But on the other hand, you have the  
16 European Commission, as I mentioned in my  
17 statement; they did a survey before they started  
18 the whole revision, on how the general public  
19 would think that the organic rules should be.  
20 And there was a strong input from consumers,  
21 saying that they would like the rules to be  
22 stricter.

1                   So there are different discussions;  
2 they come from different parties, from different  
3 sites.

4                   CHAIRMAN CHAPMAN: Thank you. Francis?

5                   DR. THICKE: Thank you. So several  
6 quick questions. One is, did you say that in the  
7 Netherlands, a lot of hydroponic growers are  
8 growing it to U.S. organic standards, and they  
9 can't sell it in the Netherlands, but they can  
10 sell it in the U.S., they are selling it?

11                   MS. BLOM: Yes, there is one  
12 consortium of several companies together. They  
13 are NOP certified. They produce in the  
14 Netherlands; they sell their produce on the  
15 American market as organic. They cannot sell it  
16 in Europe as organic.

17                   And that's not the 1,700 acres; that's  
18 the smaller one. That's about 40 acres.

19                   DR. THICKE: Okay. And if the U.S.  
20 allows hydroponics across the board and the  
21 European Union does not, what's that going to  
22 mean for trade? Will there be some change and

1 some problems with trade over time?

2 MS. BLOM: At least, we would call  
3 upon the European authorities to re-negotiate the  
4 equivalency agreement. That would be something.  
5 But at the moment, there are already hydroponic  
6 products produced in America, and technically  
7 there is no exemption made in the equivalency  
8 agreement. So it can be traded in Europe already  
9 as organic.

10 But if it will be really formalized  
11 through this decision and formalized through the  
12 regulations, I think we'd have to ask to start  
13 re-negotiating the equivalency agreement.

14 DR. THICKE: And one quick last thing;  
15 how likely do you think it is that European  
16 Commission will consider the suggestion that  
17 everything has to be in the soil; that that will  
18 be adopted by the European Union? Will that  
19 outlaw all container production? Do you think  
20 that's very likely to happen?

21 MS. BLOM: Yes, it's part of the whole  
22 revision. As I said, it's part of political

1 agreement, it has to be acknowledged and go  
2 through whole system.

3 I would say there is 90 to 95 percent  
4 chance that it will go further.

5 CHAIRMAN CHAPMAN: Thank you; Ashley,  
6 and then we'll have to stop there.

7 MS. SWAFFAR: So, Francis, you started  
8 on where I had my question. So, containers; are  
9 they allowed in your country right now?

10 MS. BLOM: Only for the exceptions;  
11 for the transplants and the herbs.

12 MS. SWAFFAR: Okay, so you don't allow  
13 any raised beds, anything like that? Everything  
14 has to be in the upper crust of earth?

15 MS. BLOM: Yes.

16 CHAIRMAN CHAPMAN: Thank you. Up next  
17 we have Jim Fullmer, followed by Kyla Smith.

18 MR. FULLMER: Hello, honorable NOSB,  
19 my name is Jim Fullmer. I am with the Demeter  
20 Association in the U.S., Executive Director. I'm  
21 also a certified organic farmer from the state of  
22 Oregon. And there's Mark Kastel taking my

1 picture.

2 I guess I'm going to lead where you  
3 left, with the crust of the earth, and I'll start  
4 there. Then I'll get into biodynamic agriculture  
5 if I have time.

6 But I'll start with a slide of the  
7 Earth. Those of you -- I was born in 1960, and  
8 this was a famous shot taken from Apollo 17,  
9 known as the Blue Marble.

10 I was 12 years old, but I remember it  
11 vividly, and I remember the excitement of  
12 humanity, of modern culture to be seeing  
13 ourselves for the first time, collectively.

14 So I just wanted to make a testament  
15 for soil in organic agriculture, and I'll start  
16 with a British scientist named James Lovelock.

17 Some of you might remember him; he  
18 postulated the Gaia theory, that proposes that  
19 the Earth herself is a self-regulating, complex  
20 system, involving the biosphere, the atmosphere,  
21 the hydrosphere, and the pedosphere, tightly  
22 coupled as an evolving system.

1           The theory sustains that the system as  
2 a whole, called Gaia, seeks a physical and  
3 chemical environment optimal for contemporary  
4 life.

5           The outermost layer of the Earth's  
6 crust, the pedosphere, going to Earth science, is  
7 the sum total of all the organisms: soils,  
8 water, and air. The pedosphere is the skin of  
9 the Earth, and only develops when there is a  
10 dynamic interaction between the atmosphere, which  
11 would be the air above and below the soil; the  
12 biosphere, which is the life, living organisms;  
13 the lithosphere, which is basically the bedrock;  
14 and the hydrosphere, which is water.

15           So essentially, this pedosphere, this  
16 crust of the Earth, the outermost crust of the  
17 Earth, is the foundation of all terrestrial life  
18 on this planet, period. So this thin, fragile  
19 layer is not only the foundation of organic  
20 agriculture; it's the foundation of all  
21 agriculture, of all life, and of human  
22 civilization itself.

1           So I argue it's a necessary foundation  
2 of organic agriculture. And I know this is  
3 philosophical; I have less than a minute to get  
4 into the agronomics; soil.

5           CHAIRMAN CHAPMAN: Thank you, Jim.  
6 Harriet?

7           MS. BEHAR: So we hear from people  
8 that our planet is polluted, and we have issues  
9 with overspray and drift, and needing to protect  
10 what limited resources we have. Can organic  
11 agriculture, in fields, in soil, do anything to  
12 correct that problem? Or do you think we just  
13 need to abandon that and go indoors?

14           MR. FULLMER: Or go to Mars or  
15 somewhere? I think this is where the discussion  
16 of regenerate comes from. I argue it's the  
17 premise of biodynamic agriculture, which is what  
18 I do.

19           But it's the idea that you organize a  
20 farming system in such a way that you're  
21 generating a natural resource out of the living  
22 dynamics of how you manage the farm itself;

1 integrating livestock back into the farming  
2 systems, specified and crop rotation. Your aim  
3 is to build soil humus. For lack of another  
4 word, that's a healing process.

5 CHAIRMAN CHAPMAN: Sue?

6 MS. BAIRD: When I was in Egypt, I  
7 toured a wonderful farm that is managed by SEKEM;  
8 are aware of SEKEM?

9 MR. FULLMER: Very much so.

10 MS. BAIRD: From Germany, and it's  
11 biodynamic. They had literally turned the desert  
12 into an oasis. But it wasn't the sand; it was a  
13 biodynamic prep. It wasn't the sand, the desert,  
14 that caused that oasis; it was biodynamic preps,  
15 run through a drip irrigation. Can you address  
16 that for me, please?

17 MR. FULLMER: Biodynamic preparations  
18 in 30 seconds; I'd argue it was the whole system.  
19 And so Helmy Abouleish and his father, who has  
20 now passed, literally formed a biodynamic farm  
21 organism, integrating livestock, goats, the whole  
22 thing, along with the biodynamic preparations.

1                   They won a Nobel Prize for not only  
2                   the social side of that, but the ability to turn  
3                   desert into arable land.

4                   CHAIRMAN CHAPMAN:   Okay, I'm going to  
5                   go with Dave, and then I'm going to have to stop  
6                   there.

7                   MR. MORTENSEN:   Jim, in Marian's  
8                   country, the Netherlands, and in Northern Europe,  
9                   they don't allow the use of genetically modified  
10                  crops; it's just not allowed.  I had the  
11                  opportunity to go over and speak there about  
12                  this.

13                  Would you say -- and in our organic  
14                  community, we are very concerned about the use  
15                  and the contamination of organic crops with  
16                  genetically modified crops.

17                  Would you say that the policies are  
18                  more in line in Marian's country, when they don't  
19                  allow genetically modified crops and have a  
20                  concern about growing plants in the soil, than  
21                  are policies on genetically modified crops and  
22                  organic agriculture?

1                   MR. FULLMER: You know, I'll reference  
2 the U.S. Demeter Farm Standard, which honestly is  
3 in a quagmire with the situation, in that the NOP  
4 has GMOs as an excluded method. It really  
5 doesn't address drift unless there is drift. The  
6 U.S. Demeter Farms Standard has a position of,  
7 none detected if tested.

8                   And so it's a growing sector of the  
9 U.S. marketplace, Demeter product, and it looks  
10 highly unlikely that there could be biodynamic  
11 corn coming from Iowa, for instance, just because  
12 it's going to be contaminated.

13                   So is that realistic, and is that  
14 tough on it? I don't know. Is it tough on  
15 farmers? Yes. The Demeter Standard would allow  
16 a farm that had, say, contaminated corn and still  
17 be a biodynamic farm, but it could not sell that  
18 corn as biodynamic.

19                   So whatever that means -- and I'm not  
20 sure if that's answering your question --

21                   MR. MORTENSEN: I guess I was trying  
22 to think through; I was struggling with the

1 inconsistency of our attitudes about policy. We  
2 are frustrated, and we don't want genetically  
3 modified crops; and I'm right there.

4 And Europe is, I think, much more  
5 forward-looking and progressive there. I then  
6 tend to look to the Europeans for what they are  
7 thinking about soil-grown plants. And it seems  
8 to me that the two are in parallel in Europe,  
9 whereas we're going in the opposite direction  
10 with some of our policies, between genetically  
11 modified crops and soil. Or maybe almost in  
12 parallel, at this point.

13 MR. FULLMER: With Europe, the same  
14 would be as our colleagues in the Netherlands, so  
15 the same with hydroponics also.

16 MR. MORTENSEN: Thank you.

17 CHAIRMAN CHAPMAN: Thank you. Up next  
18 is Kyla Smith, followed by Jo Ann Baumgartner.  
19 Kyla, if you'll start with your name and  
20 affiliation?

21 MS. SMITH: Good afternoon, my name is  
22 Kyla Smith. I'm the Certification Director at

1 Pennsylvania Certified Organic. I also serve as  
2 the chair of the Accredited Certifier's  
3 Association Board of Directors. PCO certifies  
4 over 1,300 operations.

5 I'll be commenting on the CACS's  
6 proposal on excluded operations in the supply  
7 chain.

8 First, I'd like to express PCO's  
9 support on this initial step towards tackling the  
10 issue of securing the integrity of the organic  
11 seal in the marketplace. As our industry grows,  
12 working together towards this goal is  
13 increasingly important, and we will need to apply  
14 a multi-pronged approach, utilizing all of the  
15 tools available to us, such as guidance and rule-  
16 making.

17 The approach recommended in this  
18 proposal is sound; however, the execution may not  
19 be. While the proposal stated that it did not  
20 address labeling, it did hone in on the word,  
21 labeled, used at 205.101, as required criteria to  
22 allow an operation to be excluded from

1 certification.

2 The section 205.101 does not specify  
3 which labeling provisions are required, and there  
4 are several. The proposal would essentially  
5 require the labeling elements outlined at  
6 205.303, on non-retail labels, which is covered  
7 at 205.307.

8 It was stated at the NOC meeting  
9 during the presentation on this topic, that the  
10 regulations at 205.307 only apply to packaging  
11 labels when the product inside that package is  
12 labeled according to 205.303.

13 In July of 2016, an ACA working group  
14 completed a best practices document regarding  
15 products handled by uncertified wholesalers and  
16 distributors. It included this statement:  
17 Containers of packaged produce may only be  
18 labeled as per 205.307 when the packaged produce  
19 in the non-retail container is labeled in  
20 compliance with 205.303.

21 In January of this year, NOP conducted  
22 its annual certifier training, which included a

1 session on this topic, to clarify parts of the  
2 ACA best practice document.

3 Specifically, the NOP covered the  
4 labeling sections at 205.303 and 205.307. They  
5 did not agree with the working group's  
6 interpretation of 205.307, which as stated  
7 before, would have only allowed product being  
8 labeled according to 205.307 if the product  
9 inside was labeled according to 205.303.

10 If the Board passes this  
11 recommendation today, it will be imperative for  
12 the program to provide further guidance to  
13 certifiers to clarify if the revisions to this  
14 guidance support the regulations or not.

15 With confirmation and further training  
16 by the program, PCO supports this proposal.  
17 However, this is the critical piece; I cannot  
18 stress this enough, as this message has not been  
19 conveyed to certifiers in the past.

20 If the program does not agree with the  
21 proposed revisions; if they align with the  
22 current regulations, it appears that these

1 changes would need to be made through rule-  
2 making. PCO would welcome clarification in this  
3 area, as there seems to be ongoing confusion.

4 Thank you for all of your service and  
5 for the opportunity to comment.

6 CHAIRMAN CHAPMAN: Emily?

7 MS. OAKLEY: I have a question about  
8 vitamin B1.

9 MS. SMITH: Okay; I may not be the  
10 best person to ask.

11 MS. OAKLEY: I can wait and ask  
12 someone else.

13 MS. SMITH: If it's more material-  
14 related, Jen Berkebile, our materials program  
15 manager, will be commenting later today.

16 MS. OAKLEY: No problem.

17 CHAIRMAN CHAPMAN: Scott?

18 MR. RICE: Thanks, Kyla. I would  
19 whole-heartedly agree that we definitely need to  
20 be on the same page, and would welcome NOP's  
21 affirmation that our interpretation of the  
22 standard is parallel with their own. So I

1 understand we'll be trained on that again in  
2 February, at our annual training.

3           Hopefully at that point, we will get  
4 that affirmation. But I just wanted to offer  
5 that.

6           MS. SMITH: Thank you.

7           CHAIRMAN CHAPMAN: I had a quick  
8 question, comment on that as well. I read your  
9 comments and much appreciated it. It was  
10 probably an oversight that we didn't mention  
11 205.307 in our document in sufficient detail.

12           But the logic that we applied to  
13 excluded operations applies to that section as  
14 well, because it clearly states, labeled, and so  
15 205.303 would apply.

16           But for a question to you; is your  
17 interpretation of that section in line with what  
18 I had just stated here as well? That to truly be  
19 in compliance with 205.307, the product in the  
20 non-retail-labeled containers must be compliant  
21 with 205.303?

22           MS. SMITH: No.

1                   CHAIRMAN CHAPMAN: That is not your  
2 interpretation?

3                   MS. SMITH: And that's not what the  
4 NOP had trained its certifiers on.

5                   CHAIRMAN CHAPMAN: Which is correct.  
6 Our additional guidance related to 5031 is not in  
7 there currently either. And so I would not  
8 expect them to train to that either, because they  
9 have not accepted that at this time.

10                  Thank you. Up next is Jo Ann  
11 Baumgartner, followed by Anais Beddard.

12                  MS. BAUMGARTNER: Hi, I'm Jo Ann  
13 Baumgartner, with the Wild Farm Alliance. On the  
14 subject of hydroponics, we think it's important  
15 that you consider soil biodiversity.

16                  With regard to the NOP's biodiversity  
17 conservation guidance, I want to give you an  
18 update that the organic certifiers are starting  
19 to comply with it, although most still need to  
20 fix their OSPs, especially related to water and  
21 wildlife issues, as you can see in our recently  
22 published report on our website.

1                   But what I mostly came here to speak  
2 about is protecting native ecosystems from  
3 conversion. Thank you, NOSB, for working on this  
4 issue. While the proposed rule is a good start,  
5 some changes need to be made.

6                   First, don't narrow the scope of  
7 native ecosystem protection to land that has  
8 never been cultivated or grazed. Most land in  
9 the world that could be grazed, has been grazed.  
10 Some land that has been cultivated has recovered  
11 and now is considered a native ecosystem.

12                   Define native ecosystems in the rule  
13 in a way that assessments can be made on species  
14 present, using these four categories of  
15 vegetation: natural, semi-natural, ruderal, and  
16 cultural.

17                   Sites dominated by vegetation  
18 classified within the first two categories of  
19 natural and semi-natural should be treated as  
20 native ecosystems.

21                   We recommend this wording as site-  
22 supporting; a native ecosystem cannot be

1 certified for organic production as provided  
2 under this regulation for a period of 10 years  
3 from the date of conversion.

4 Because of all these changes, we urge  
5 the NOSB to send this back to the subcommittee to  
6 get it right. The NOSB should clearly state its  
7 intent to focus on the transitioning to organic  
8 the 99 percent of land where prohibitive  
9 materials have been applied; and to conserve  
10 those native ecosystems that will be necessary to  
11 support declining and rare species, as you see  
12 here next to their degraded ecosystems, today and  
13 100 years from now, when there will be much less  
14 land available, due to increased population and  
15 climate change.

16 Let's make sure the USDA label stays  
17 credible. Thank you.

18 CHAIRMAN CHAPMAN: Emily?

19 MS. OAKLEY: Hi, Jo Ann. I noticed  
20 that a lot of the commenters referenced the Wild  
21 Farm Alliance's analysis of this, and I'm  
22 wondering if you feel like you can confidently

1 state that you have a wide diversity of  
2 stakeholder support for this revised definition  
3 that you've proposed?

4 MS. BAUMGARTNER: Well, there were  
5 over 300 comments, and a significant number of  
6 them mentioned our comments. I think that they  
7 feel confident that we know what we're talking  
8 about.

9 And we are not just Wild Farm Alliance  
10 exclusively, our board and constituents, but we  
11 work with partners in the organic and  
12 conservation world.

13 CHAIRMAN CHAPMAN: Harriet?

14 MS. BEHAR: Hi, Jo Ann. As the lead  
15 on this issue -- and I know I've spoken with you  
16 many times; we've had what I like to call,  
17 earnest conversations -- about being careful, I'm  
18 totally with you on protecting those very rare,  
19 pristine, and precious areas.

20 But also, I don't want to cast too  
21 wide a net, to take away land that -- and as one  
22 commenter did mention, like a takings -- I just

1 want to make sure that we have a good definition  
2 that can be verified.

3 Just having some old, tired pasture  
4 that hasn't been pasture for 50 years, but has no  
5 biodiversity on it; that could still be  
6 organically approved; but lands that would have  
7 regeneration of a diverse group of plants and  
8 animals as a native ecosystem, that's what we  
9 were trying to preserve.

10 So I know that that's a big challenge,  
11 to figure that out, so we find the right line and  
12 don't cast the net too wide out there.

13 MS. BAUMGARTNER: Yes. I did see that  
14 one comment on takings; and takings have to do  
15 with when the government comes in puts in a  
16 freeway; they take your land.

17 But the NOP; it's a voluntary program,  
18 so it's not taking. Yes, the way we propose to  
19 define native ecosystems splits out those four  
20 definitions, and ensures that lands that have  
21 those native ecosystems, even if they were  
22 previously converted to agriculture but have

1 recovered; that they are protected.

2           There is a place within those four  
3 definitions; the premier native ecosystem is  
4 really easy to determine, and so is the cultural  
5 ecosystem, where it's just weeds, basically, or  
6 invasive species.

7           The nuance comes when you're looking  
8 at the different between semi-natural ecosystems  
9 and ruderal ecosystems; and in both situations,  
10 the habitat was significantly changed because of  
11 humans.

12           But in the cultural situation, it  
13 never recovered fully, and it's because that land  
14 cannot recover fully. It's surrounded by other  
15 lands that don't allow the recovery to occur; the  
16 natural dispersion of plants and animals, and the  
17 way that wind and water and soil helps to  
18 regenerate ecosystems.

19           CHAIRMAN CHAPMAN: Thank you, Jo Ann.

20           MS. BAUMGARTNER: Thank you.

21           CHAIRMAN CHAPMAN: Up next I have  
22 Anais Beddard, followed by Dave Chapman; and we

1 are 30 minutes behind at this point.

2 MS. BEDDARD: Hi, I'm Anais Beddard,  
3 and I'm the second generation of Lady Moon Farms.  
4 We're the largest organic vegetable grower east  
5 of the Mississippi, with farms in Florida,  
6 Georgia, and Pennsylvania.

7 We've been farming organically for 30  
8 years. Our success is based on the founding  
9 principle that makes organic farming what it is;  
10 feed the soil and let the soil feed the plant.

11 We focus on nourishing the land and  
12 increasing our organic matter, which creates a  
13 strong and robust base to grow a variety of  
14 vegetables.

15 The most basic tenet of organic  
16 farming is that all health in plants, livestock,  
17 and humans flows from the immense biodiversity  
18 that is found in healthy, organically-managed  
19 soils.

20 Remove soil from the equation and  
21 you've removed the concept of what it means to be  
22 organic. Everyone agrees that straight

1 hydroponics should not be organic. The debate  
2 now is over semantics, with container systems  
3 claiming they are completely different production  
4 systems.

5 That is false, and while each of us is  
6 entitled to our own opinions, we are not entitled  
7 to our own facts. When you grow plants with  
8 daily doses of liquid feed, that is hydroponics.  
9 Whether the roots are suspended in water or coco  
10 coir, that does not make a difference.

11 And since we all agree hydroponics are  
12 not organic, the same logic follows that  
13 container growing is also not organic. The fact  
14 is reinforced under OFPA. Several places  
15 throughout the act, soil is mentioned  
16 specifically, using strong language such as, must  
17 and shall.

18 The intent of OFPA was centered around  
19 a holistic growing system. It focuses on  
20 building the soil, nurturing the ecosystem where  
21 the farm resides. When you have strong soil, you  
22 need less fertilizer; you have fewer insect

1 problems. And guess what? Your plants thrive  
2 too.

3 That allows us to grow successfully  
4 each year, without heavy-duty pesticides or many  
5 liquid nutrients. It isn't the lack of these  
6 items that makes the production system organic;  
7 rather, it's the production system that allows us  
8 to be judicious with our inputs.

9 You cannot relate a closed-loop  
10 container hydroponic system to this. Yet, some  
11 regulations in OFPA are not applicable for  
12 hydroponic container systems. The organic  
13 certification process is difficult, that's why a  
14 transition period was created; it takes a long  
15 time.

16 Annually, we are audited for crop  
17 rotations, cover crops, nutrients, soil tests.  
18 They are meant to understand how we are  
19 supporting soil and the land where we farm.

20 Container hydroponics do not have to  
21 meet those requirements, and thus they should not  
22 be organic. We are at a point in organic history

1 where we must stand up and protect this  
2 production system, because it could be our saving  
3 grace.

4 The greatest threat to our generation  
5 is global warming. Soil-organic farmers are  
6 combating this every day, using organic  
7 techniques with the ground beneath our feet.

8 I view myself as the future steward of  
9 the land that my parents raised before me. Much  
10 like a child, it is my duty to protect and  
11 nurture, and this is what will allow the land to  
12 continue to provide for future generations.

13 Thank you.

14 CHAIRMAN CHAPMAN: Thank you. Emily?

15 MS. OAKLEY: Do you support the crop  
16 subcommittee's proposal that the motion on  
17 containers, or are you opposed to any form of  
18 containers?

19 MS. BEDDARD: I would prefer it to be  
20 in the ground, in the soil. But I think we are  
21 at a point, if nothing is passed, then we will  
22 continue to have more businesses grow and expand

1 using container production, and I do not agree  
2 with that.

3 So I think, with our options, I would  
4 be in support of the proposal.

5 CHAIRMAN CHAPMAN: Harriet?

6 MS. BEHAR: So that would be kind of  
7 a compromise position for you?

8 MS. BEDDARD: It would be a  
9 compromise. It would be a big compromise. But I  
10 think we have such differing views, it is a  
11 strong compromise, because it at least levels the  
12 playing field a little bit.

13 We are talking about two completely  
14 different production systems. This is night and  
15 day, what we do versus what these container  
16 systems do. So it's a huge compromise, but I  
17 think if that's the option on the table, I could  
18 get behind it.

19 CHAIRMAN CHAPMAN: Asa?

20 MR. BRADMAN: Yesterday I used the  
21 knife metaphor, like I'd like to cut myself in  
22 half, so I could vote both ways.

1                   CHAIRMAN CHAPMAN: We didn't like  
2 that.

3                   MR. BRADMAN: Maybe this is Solomon's  
4 knife. But I'm torn on this issue. Last week, I  
5 talked with somebody who is a generational  
6 organic farmer. The son is actually your  
7 generation, maybe a little older, but second  
8 generation.

9                   He's been exclusively a soil grower  
10 all their lives, in both contexts. And he's open  
11 to these ponc methods, very emphatically, and  
12 feels like it's totally consistent with organic.  
13 And he really came from the same place you came  
14 from.

15                   And without presaging your answer;  
16 what do you think of the label compromise? Is  
17 that a compromise, or would that essentially be a  
18 sellout, from your point of view?

19                   MS. BEDDARD: So you're saying, USDA  
20 organic, and underneath, hydroponic?

21                   MR. BRADMAN: I'm not sure what form  
22 it would take. Maybe it would be a hydroponic

1 label, but it would be run by USDA. Or it would  
2 be -- I've seen it in the comments, aquagamics,  
3 hydroganics. You know, there is a constituency  
4 out there that's not just corporate hydroponic,  
5 that is very grounded in the history of organic.

6 They take a different view, and I'm  
7 being asked to judge this at some level. So I  
8 would be interested to hear your comment as a  
9 second-generation peer to this person who had  
10 such a different view.

11 MS. BEDDARD: Right. I think there  
12 definitely needs to be a separate label, because  
13 consumers need to know the difference when  
14 they're buying soil or hydroponic. I've talked  
15 to a lot of friends about this, and most of them  
16 don't quite get what organic farming is.

17 I had a section on it, but I was  
18 running out of time, so I cut that all out. But  
19 I think there needs to be a label. I do not  
20 think using the USDA organic seal is the answer,  
21 because I think that will lead to more confusion.

22 A separate label that does not have

1 that seal; because if you have that seal, that is  
2 what we are known for. That is organic farming,  
3 and that is in the soil.

4 But I would be in favor, sure, of  
5 hydroganic; something like that, yes.

6 MR. BRADMAN: What if it was run by  
7 the NOP?

8 MS. BEDDARD: I'm really torn there.  
9 I think it needs to be something separate. If  
10 the NOP was able to create a completely separate  
11 label with separate functions; some similarities,  
12 I'm sure, would be there, with promoting  
13 biodiversity and being sustainable and renewable.

14 But I just don't think it can be the  
15 same USDA organic seal that everybody is used to  
16 using now for soil organics.

17 CHAIRMAN CHAPMAN: Thank you, we have  
18 to move on. Up next is Dave Chapman, followed by  
19 Gerald Davis. Dave, if you could start with your  
20 name and affiliation.

21 Mr. DAVE CHAPMAN: I try to keep it  
22 exciting here. I'm Dave Chapman from Long Wind

1 Farm, and I am a farmer; I think you probably all  
2 know me by now.

3 And I was also on the USDA task  
4 force, so I have actually investigated this issue  
5 a lot. I also have a number of close friends who  
6 are serious hydroponic growers, and I would just  
7 say they're all very proud of how they grow.

8 They're not embarrassed by it; they  
9 don't think it's secondary in any way. I know  
10 there's a famous comment in a C2F board meeting  
11 by a member who said, Hydroponic is better than  
12 soil growing.

13 So that's a different point of view  
14 from mine, and they've always rolled their eyes  
15 at me growing in the soil, thinking that it's  
16 kind of cute and old-fashioned.

17 The NOSB has decided twice now in the  
18 last seven years that hydroponic should not be  
19 called organic; first in 2010, and again in the  
20 famous non-binding resolution, both of which  
21 passed overwhelmingly.

22 So it's interesting that the

1 discussion now is whether container growing is  
2 hydroponic, and it's an important discussion  
3 because probably over three-quarters of the  
4 currently certified organic production comes from  
5 two producers who are saying they are not  
6 hydroponic; they're container growers.

7           So I brought a container -- just a  
8 little fun and games, here. This is a container;  
9 this is maybe the size that you might grow a  
10 tomato in, in a hydroponic system.

11           This is a block of coco coir, which is  
12 used in about half of the conventional hydroponic  
13 production in the world. And Tom re-approved,  
14 and when you wet it, it expands to about eight  
15 times the size that it is now. And it kind of  
16 looks like soil.

17           So it's easy to say, Well, that's not  
18 hydroponic, but this is how most hydroponic  
19 production looks like for tomatoes, cucumbers,  
20 peppers, berries. If you just feed this water,  
21 it dies, it starves to death. If you feed it a  
22 nutrient solution, then it thrives.

1                   The bioponic folks are saying, Yes,  
2                   but we have biology with compost. However,  
3                   they're saying, We can't add more than 10 percent  
4                   of the volume as compost, or it doesn't work.

5                   So it's not really a soil-based  
6                   system, and again, if you add water, it dies. If  
7                   you add a nutrient solution, it thrives. And  
8                   that makes it hydroponic.

9                   So just to get -- this isn't  
10                  complicated. This is a simple thing. None of my  
11                  hydroponic friends would say, That's not  
12                  hydroponic. Of course this is hydroponic,  
13                  whether you add the compost or not.

14                  Now, I think it's a fair debate about  
15                  whether hydroponic is better than organic; but  
16                  it's not a fair debate about whether this is  
17                  hydroponic. This is hydroponic.

18                  What they do is, feed a lot this,  
19                  which is 16-0-0; a nitrogen, hydrolyzed soy  
20                  protein -- which, if you mis-mix it, will burn  
21                  the roots off the plant, according to John Spargo  
22                  at Penn State. So it's a hot thing, very much

1 like a conventional fertilizer. I'm sorry I  
2 can't go further.

3 CHAIRMAN CHAPMAN: Thank you, Dave.  
4 Questions for Dave? Harriet, then Emily. I'm  
5 going to have to stop it there.

6 MS. SMITH: I might ask Amri this  
7 question, but that hydrolyzed soy protein; does  
8 that come from a GMO source?

9 Mr. DAVE CHAPMAN: Better ask; better  
10 ask Amri that. I don't know.

11 CHAIRMAN CHAPMAN: Emily?

12 MS. OAKLEY: I want to ask the same  
13 question; if you support the crop subcommittee's  
14 motion on containers in the proposal?

15 Mr. DAVE CHAPMAN: Yes, my answer is  
16 similar to Anais'; I would far away prefer to  
17 have the EU standard, that organic should be in  
18 the ground; I think it's less complicated.

19 I do believe that you can have  
20 something with about 95 percent of the benefits  
21 of in-the-ground in a big container with a real  
22 soil compost blend. I do support passing the

1 proposal. I actually believe it's the last  
2 chance we're going to have to save the national  
3 organic program. I think this is it.

4 Divisive issue that's never going to  
5 go away, unless it gets resolved at this meeting,  
6 so I hope you will pass it.

7 CHAIRMAN CHAPMAN: Thank you, David.  
8 Up next I have Gerald Davis, followed by Davey  
9 Miskell. Please start with your name and  
10 affiliation.

11 MR. DAVIS: Gerald Davis, Grimmway  
12 Farms. I represent Grimmway Farms; I'm also an  
13 ex-NOSB member. I actually worked on the 2010  
14 greenhouse and container-growing hydroponic  
15 recommendation, and my comments today are on that  
16 subject.

17 Grimmway Cal-Organic is the largest  
18 organic vegetable grower in the U.S., topping  
19 \$500 million in sales in organic vegetables.

20 We grow 26 different crops year-round,  
21 primarily on land which is owned by the farm.  
22 Grimmway is family owned and managed, founded by

1 the Grimm brothers as shown here about 20 years  
2 ago.

3 Today, the next generation of Grimm  
4 family sons are taking their place, each in  
5 separate production, handling, and sales  
6 management areas.

7 Cal-Organic has grown with the organic  
8 consumer demand by transitioning over 38,000  
9 acres of conventionally-cropped land into  
10 organic.

11 This land did not magically turn  
12 around through simple input substitution of  
13 organically-approved materials, but took years of  
14 compost applications, green manure, cover  
15 cropping, and proper crop rotation to be nurtured  
16 to healthy soils.

17 One by one, these individual farms are  
18 being stewarded through the healing process  
19 toward quality, high-yield organic vegetable  
20 production, matching or exceeding our  
21 conventional division yields within the company.

22 It takes time and commitment to

1 organic principles, which includes financial  
2 commitment to not take shortcuts. Outdoor  
3 container production is one such shortcut that  
4 bypasses land stewardship and soil ecology  
5 development altogether.

6 This production system does not follow  
7 many sections of the organic regulations, and  
8 virtually ignores the intent of organic  
9 principles of land stewardship.

10 Such outdoor operations that have  
11 sprung up in California have been wrongly  
12 certified, since no statutory standards exist to  
13 exempt them from adhering to land sections of the  
14 law.

15 Greenhouse production; at the request  
16 of one of our most valued retail grocery  
17 customers a few years ago, we conducted what  
18 turned out to be an eight-year feasibility study  
19 of organic greenhouse tomato production. We  
20 spent millions on this; we know very well the  
21 answers to some of the questions you are asking  
22 about this method.

1           It is our opinion that containerized  
2 production is merely a shortcut to bypass the  
3 expensive and time-consuming process of organic  
4 certification. We say, Let the hydroponics  
5 production method develop its own marketing  
6 label, based on the merits of their system; not  
7 ride the coattails of a successful label that  
8 doesn't match their methods or goals.

9           Any questions?

10          CHAIRMAN CHAPMAN: Thank you; Steve?

11          MR. ELA: Could you elucidate, in your  
12 greenhouse systems, what sort of fertilizer  
13 program you're using; what percent is liquid,  
14 what percent is non-liquid?

15          Mr. DAVIS: Initially, when we started  
16 it in the late 2000s, when I was still on the  
17 board, it started out as about 25 percent  
18 compost; coco fiber, rock minerals, mycorrhizae,  
19 other bacterial inoculants, and we extracted our  
20 nitrogen from stable, mature compost.

21                 We did that for two or three years,  
22 until the wonderful compost we had acquired ran

1 out. After that, we switched to seabird guano  
2 sources from South America. Eventually, the last  
3 material we were using was -- we did use some  
4 fish over the years; that was smelly and not very  
5 nice.

6 And then the last material, the last  
7 couple of years, we just used sodium nitrate.  
8 Eventually, we closed the facility and it's for  
9 sale. We have decided this is not what we would  
10 call an organic system, and don't see it as  
11 sustainable.

12 CHAIRMAN CHAPMAN: Dan?

13 DR. SEITZ: Yes, can you elucidate a  
14 little bit further on why you don't see it as  
15 sustainable? I mean, what are the discreet  
16 factors that really drove that decision?

17 And also, in terms of the quality of  
18 the produce, whether flavor or nutritional  
19 content or whatever; was that a factor at work in  
20 your decision?

21 Mr. DAVIS: The quality of the  
22 produce, from time to time was pretty good. But

1 a lot of times, it was not so great. Feeding  
2 tomatoes soluble nutrients day in and day out  
3 leads to a lot of problems.

4 Whitefly infestations without  
5 pesticides that really control them is a big  
6 problem, and whitefly can do very, very well on  
7 soluble- and nitrogen-fed tomatoes.

8 Bacterial diseases like Clavibacter  
9 gave us a ton of problems. Again, it's well known  
10 that feeding soluble nutrients -- nitrogen -- to  
11 plants tends to lead to more disease. And we  
12 really discovered that in a very difficult and  
13 expensive way.

14 CHAIRMAN CHAPMAN: Emily and Harriet,  
15 and then we'll have to stop it there.

16 MS. OAKLEY: As someone who worked on  
17 the 2010 recommendation, could you give us your  
18 opinion about how the crop subcommittee's  
19 proposal fits in line or not with that?

20 And I don't want to disparage the  
21 minority view, but there have been some that feel  
22 that it is more in line with the 2010

1 recommendation, and I wondered if you had an  
2 opinion about that.

3 Mr. DAVIS: My basic thoughts on your  
4 recommendation; when I was on the board, we  
5 worked on the pasture recommendation for years,  
6 and we thought we had a very good, very  
7 definitive rule that we proposed, and it  
8 eventually became a rule. We just made the  
9 recommendation, obviously.

10 I see your recommendation as what will  
11 be subject to the same pitfalls. You will think  
12 that it's a good compromise, and you're trying to  
13 set up a system that you think will satisfy both  
14 sides. But with what we see with the scofflaw  
15 organic dairies that get away with it year after  
16 year and not pasturing; there's ways around your  
17 recommendation, if it's put into law.

18 You can't feed a crop in a container  
19 on only 20 percent of the total nitrogen need of  
20 the crop. It becomes a hydroponic system after a  
21 few months, even if it's super well-constructed;  
22 lots more compost. Eventually, in a nine-month

1 tomato crop, it runs out, and for at least the  
2 second half of the crop, you have a 100 percent  
3 hydroponic system.

4 And the reason I say that is sort of  
5 like what Dave Chapman just said in a simpler  
6 way. If you withhold the nutrient feed, the crop  
7 stops, and it will not harvest anymore within  
8 just a week or two.

9 And so yes, that's 100 percent of the  
10 need of that crop is coming from that; so how do  
11 you put a 20 percent level on it? I don't see  
12 how you can do it; I don't think it's  
13 enforceable.

14 CHAIRMAN CHAPMAN: Thank you.  
15 Harriet, and then we'll move on.

16 MS. BEHAR: Many of the currently  
17 organically-certified hydroponic producers will  
18 have an economic impact if we vote in the current  
19 crops committee recommendation. If that fails,  
20 would there be an economic impact on your  
21 operation if more and more hydroponic operations  
22 are carrying the organic seal in the marketplace?

1           Mr. DAVIS: Not sure; I know there is  
2 a large vegetable farm on the west coast that is  
3 waiting, I hear, to see how this board and the  
4 NOP eventually comes up with rules, and to see if  
5 their floating lettuce program will be allowed.  
6 They would love to make that as organic.

7           So yes, if they were able to do that  
8 and pull that one off, then yes. I don't know  
9 where it would lead. When I helped craft that  
10 recommendation, I had no clue that seven years  
11 down the road, there would be vast acreages of  
12 containerized blueberries and raspberries and so  
13 on and so forth, proliferating through  
14 California, basically doing what I was suggesting  
15 we should allow for greenhouses; to construct a  
16 good soil and make it as much like real soil as  
17 possible, biodynamically and everything.

18           So the unintended consequences of what  
19 I helped craft, I'm sad to say, I'm sad to see it  
20 come to what it has.

21           CHAIRMAN CHAPMAN: Thank you. We'll  
22 have to move on now, but thank you for your

1        comments.

2                    Up next is Davey Miskell, followed by  
3 Tom Beddard. Davey, you can start with your name  
4 and affiliation.

5                    MR. MISKELL: Yes, my name is Davey  
6 Miskell; I have half-acre organic greenhouses in  
7 Charlotte, Vermont. I'm also a co-founder with  
8 Dave Chapman on Keep the Soil in Organic.

9                    And I think, with what we've proposed  
10 and the work we've done with farmers around the  
11 country, that you're going to see happening,  
12 rallies that were the past month. I'm sorry that  
13 you're not able to hear the comments of the  
14 farmers; It didn't work.

15                    Well, that's typical. So the 18th  
16 rally of Keep the Soil in Organic was today. I  
17 know a few of you came; I'm sorry that all of you  
18 weren't able to come.

19                    And they came from all over the United  
20 States, as well as Costa Rica and England. It  
21 was farmer-driven, and if the farmers like myself  
22 and Dave Chapman and a number of the other

1 farmers were completely concentrating on this  
2 issue, we would have had a couple hundred rallies  
3 around the United States, and at least 10 to 20  
4 in other countries, but we all had to farm as  
5 well.

6 So it's amazing what's happening. And  
7 I think for me and the people at the rallies, the  
8 first rally was at the NOSB meeting at Stowe,  
9 several years ago. And at that meeting, Miles  
10 pushed intensely on organic integrity.

11 For me what's happening is, the true  
12 organic integrity is here; what's behind the  
13 screen here. It's the farmers like myself, as  
14 well as young farmers like Anais, who have this  
15 commitment to soil; have a commitment to the true  
16 precepts that are in the OFPA regulations and  
17 rules.

18 These regulations and rules, what  
19 we've heard back from, whether it's Dru Rivers,  
20 who is one of the longer-term organic farmers; or  
21 Eliot Coleman as well; organic has always meant  
22 soil. And it's meant living soil, and it's meant

1 improving the environment through our farming  
2 practices.

3 That is not possible with containers;  
4 it is not possible with hydroponics, which are  
5 the same thing.

6 The other aspect that came out in  
7 these rallies -- sorry, there was a previous one  
8 of Tom Newmark, one of the leaders of the  
9 regenerative.

10 I'm sorry my time is up. Any  
11 questions? I'd be glad to answer.

12 CHAIRMAN CHAPMAN: Thank you, Davey;  
13 questions?

14 MR. MISKELL: I do support the crops  
15 committee proposal; I think it's putting a finger  
16 in the dyke.

17 CHAIRMAN CHAPMAN: Thank you, Davey.  
18 Harriet?

19 MS. BEHAR: Are there any hydroponic  
20 organic operations in Vermont?

21 MR. MISKELL: We prohibit it. Vermont  
22 organic farmers do not certify any hydroponic or

1 container operations.

2 MS. BEHAR: And there are sufficient  
3 organic foods available in Vermont?

4 MR. MISKELL: Yes, in fact there's an  
5 abundance. It's pretty competitive. We have a  
6 lot of young farmers coming up. Quite a few of  
7 them don't want to be certified because of the  
8 denigration of the organic standards by the  
9 national organic program.

10 CHAIRMAN CHAPMAN: Thank you. Up next  
11 is Tom, and Jim Gerritsen is after Tom, although  
12 we will be pausing for a brief five-minute break  
13 after Tom. We are running significantly behind  
14 at this point, so only five minutes, and I will  
15 be strict on that one.

16 Sorry to have to do that right before  
17 your announcement, Tom. You can start with your  
18 name and affiliation.

19 MR. BEDDARD: Yes, Tom Beddard, Lady  
20 Moon Farms. This is my fourth time in front of  
21 you folks to testify in support of soil in  
22 organic, and I always have a really well-written

1 three minutes, right down to the second.

2 I'm up with here with nothing, because  
3 I said to myself, You know what? This is the  
4 fourth time, man. Either you get, or you don't,  
5 Tom. And I'm wondering if everyone watching me  
6 right now is going to get it.

7 Because here's my first question: If  
8 we brought in 500 first-graders, and had a tub of  
9 soil or this; and we said to them, Where's the  
10 soil?

11 They would all know; there would be  
12 no, Well, I'm not sure.

13 And I think it's the same with  
14 pasture. You ask kids, What is a pasture? This  
15 is easy stuff, and I'm hoping that all of us can  
16 agree to what seems very common sense.

17 Also, it's not every day you get to  
18 have something really important in your life.  
19 For instance, I'm here to try to keep Asa in one  
20 piece. And I would say, You know, Asa? I don't  
21 know why you're torn. I think we're at a  
22 crossroads in history. And I think this is

1 really, really, really important stuff.

2           Organic is soil; it just is. I mean,  
3 I get that there's economic interest on the other  
4 side. But, you know, it just isn't organic, and  
5 it's too easy to be organic. Organic is hard.

6           Cropking, one of the biggest suppliers  
7 to the hydroponic community, they said on their  
8 website, The word hydroponic give no marketing  
9 benefit, and raises questions and negative  
10 responses among the general public, compared to  
11 the more desirable word, organic, which commands  
12 a premium price in the market.

13           This is what the other side is  
14 interested in. Organic is soil; it always was,  
15 it always will be. It's what brought me to it.  
16 There's nothing like a handful of soil, living  
17 and alive, and just full of strength.

18           Backyard Farms, a well-respected  
19 hydroponic tomato grower in Maine; Our plants are  
20 grown hydroponically and are non-GMO-certified.  
21 We are not organic because we do not grow in  
22 soil, which is a prerequisite for organic

1 designation.

2 And I say again, get a class full of  
3 first-graders and say to them, Is this soil? I  
4 don't think any of them would say yes.

5 So it's my hope that we can possibly  
6 bring this long-standing debate to an end, and  
7 keep organic, keep the soil in organic.

8 As I like to say, What do we want?  
9 Soil. Where do we want it? In the ground.

10 Thank you all for listening.

11 CHAIRMAN CHAPMAN: Thank you, Tom.

12 (Applause.)

13 CHAIRMAN CHAPMAN: Emily, then Steve.

14 MS. OAKLEY: So if you want soil in  
15 the ground, would you agree with the CONSCIOUS  
16 motion on containers, or would you prefer to see  
17 production stay in the soil, in the ground?

18 Mr. BEDDARD: I'm totally for  
19 production in the soil in the ground. However,  
20 you're trying to get me in trouble with my  
21 daughter. I mean, this is the thing; compromise  
22 is what moves us ahead, and it's what's keeping

1 us behind in Washington for the last, I don't  
2 know how many years.

3 So it's so hard; I generally believe  
4 in compromise. But my gosh, I believe in the  
5 soil maybe more, and I'm fearful that the  
6 compromise will be too hard to fully enforce.

7 CHAIRMAN CHAPMAN: Thank you, Tom.  
8 All right, so I'll give you a little bit more  
9 than five minutes. It's 4:22; we're going to  
10 start back promptly at 4:30. Jim Gerritsen is up  
11 first, followed by Linley Dixon; I recommend you  
12 guys get here on time. We'll be starting up  
13 promptly.

14 (Whereupon, the meeting regarding  
15 above-entitled matter went off the record at 4:22  
16 p.m. and resumed at 4:31 p.m.)

17 CHAIRMAN CHAPMAN: Okay, we are going  
18 to get started. We have a quorum of the Board  
19 present. First up is Jim Crawford, followed by  
20 Linley Dixon. If the public would please move  
21 their conversations outside or quiet down so we  
22 can take testimony. Thank you.

1                   Again, if the public could please end  
2                   their conversations or move outside. Jim, you  
3                   could start with your name and affiliation for  
4                   the record.

5                   MR. CRAWFORD: Yes, I'm Jim Crawford.  
6                   I'm an organic vegetable farmer in Pennsylvania  
7                   and a member of the Board of Directors of  
8                   Cornucopia Institute also.

9                   When I became an organic vegetable  
10                  farmer in 1972, 45 years ago, the first thing  
11                  that I did was to make a trip through Emmaus,  
12                  Pennsylvania. Sort of a pilgrimage, to  
13                  familiarize myself with the work and ideas of  
14                  J.I. Rodale, the originator in the USA of the  
15                  concept of organic agriculture.

16                  That trip started my life-long  
17                  education in organic farming, and that education  
18                  was all about soil. How biologically active,  
19                  organically managed soil could grow healthier  
20                  plants and cleaner, more nutritious food with the  
21                  least negative impact on the environment.

22                  Since that trip, soil building and

1 soil management have always been the primary  
2 focus of our farming efforts. Most of us here  
3 today, if we have ever heard of J.I. Rodale, I  
4 hope most of us have, would have to agree that  
5 J.I. Rodale would roll over in his grave if he  
6 heard us talking, considering calling hydroponic  
7 or container production organic.

8 I have an analogy that I think is  
9 useful. We all here would probably agree that  
10 human-caused climate change is a reality. Anyone  
11 with any common sense knows that we must listen  
12 to the scientists on this subject.

13 The only people trying to question  
14 climate change are the corporate players and  
15 their supporters who stand to profit mightily by  
16 having us continue to burn fossil fuels.

17 Same case with the question of  
18 hydroponic or container production being called  
19 organic. Anyone with any common sense knows,  
20 especially if they've heard of J.I. Rodale, that  
21 soil is the basis of organic farming. The only  
22 people trying to challenge the basic principle of

1 soil in organic farming are corporate players and  
2 their supporters and others who have access to  
3 far more capital and much higher level of  
4 technology than I have as a farmer.

5 The only people trying to challenge  
6 this basic principle are those who stand to  
7 profit mightily by removing the soil from food  
8 production while still calling that food organic.

9 I have no quarrel with hydroponic or  
10 container food production itself. But it is a  
11 travesty to describe this as organic. That is  
12 the plain and simple effort to profit from the  
13 word organic while failing to honor the most  
14 basic definition of the word.

15 In honoring the memory of J.I. Rodale,  
16 I agree with my fellow organic farmer Elliott  
17 Coleman, who says, quote, organic must mean grown  
18 in biologically active soil, connected to the  
19 Earth, and illuminated by the sun, end quote.

20 Thank you.

21 CHAIRMAN CHAPMAN: Thank you.

22 Question, Steve, and Emily?

1                   MR. ELLIOTT: I have a question on  
2                   nutrient cycling. How do you see the difference  
3                   between soils in containers or hydroponics liquid  
4                   feeds on how nutrients are cycled and sequestered  
5                   and taken up and released.

6                   MR. CRAWFORD: Well, how do I see the  
7                   difference in nutrient cycling?

8                   MR. ELLIOTT: Yes, what would you, I  
9                   mean you're talking about the benefits of soils  
10                  and such --

11                  MR. CRAWFORD: Nutrient cycling in  
12                  soil based agriculture is, happens in the soil.  
13                  In nature. Nutrient cycling in hydroponic  
14                  agriculture happens in man-made barrels or  
15                  whatever.

16                  MR. ELLIOTT: You see, well, I'll  
17                  leave it at that.

18                  CHAIRMAN CHAPMAN: Thank you Steve.  
19                  Emily?

20                  MS. OAKLEY: You said grown in the  
21                  soil, so does that mean that you would or  
22                  wouldn't support the CS motion for container --

1 MR. CRAWFORD: I would not support any  
2 compromise, no.

3 MS. OAKLEY: Okay, thank you.

4 CHAIRMAN CHAPMAN: Thank you Jim.

5 MR. CRAWFORD: Thank you.

6 CHAIRMAN CHAPMAN: Up next is Linley  
7 Dixon, followed by Fred Kirschenmann. Linley, you  
8 can start with your name and affiliation.

9 MS. DIXON: I'm Linley Dixon. I'm a  
10 Policy Analyst for the Cornucopia Institute, and  
11 I have a farm in Durango, Colorado.

12 Yesterday at the NOP meeting, the  
13 concept was put forward about whether the organic  
14 community should be realistic or idealistic when  
15 it comes to organic policy in particular and I  
16 actually really appreciated that thought exercise  
17 because I went home and, or back to my room, and  
18 I thought about it a long time.

19 I come out of academia and that made  
20 me want to be more compromising and realistic.  
21 But at the same time, I thought about  
22 environmentalism and imaging that the pioneering

1 farmers were more realistic than idealistic and  
2 where would we be today?

3 And I'm wondering if it's idealistic  
4 to think that we should have to share the label  
5 with mono-culture farms, hydroponic containers,  
6 confined to animal operations. Is that too  
7 idealistic to think that we shouldn't have to do  
8 that?

9 I think these operations are only  
10 temporary as long as there is cheap oil. So,  
11 from an environmental perspective, which the  
12 organic movement really is, we need to look  
13 beyond that. The time to be realistic has  
14 passed. The time to get organic right was  
15 yesterday. From an environmental standpoint,  
16 it's do or die time.

17 The frustrating thing I think to  
18 everybody who has been organic for a long time is  
19 that organic policy makers don't know what  
20 organic is anymore. If you ask farmers why they  
21 choose to be certified, the first thing they say  
22 is because we want to let our customers know

1 everything that we are doing.

2 We are rotating animals on pasture.  
3 We're multi-species cover cropping. We're  
4 composting. We are, we are, we are. Oh, and as  
5 a side note, because we are doing all these  
6 things, we don't really require very many inputs,  
7 their amendments.

8 I can't tell you how frustrating it is  
9 to have to explain those really basic fundamental  
10 truths about organic farming to policy makers,  
11 changing organic to mean only approved inputs  
12 used is completely redefining organic.

13 Real organic is well-defined by law.  
14 But there is a failure to properly certify it and  
15 enforce it. I've seen these operations first-  
16 hand. I don't know how they're certified. To  
17 hide these failures is to participate in them.

18 Many of us promote the organic label  
19 regardless of its disappointments. Cornucopia  
20 tries to promote real organic farming and help  
21 consumers find it. Real organic farmers are not  
22 only knowledgeable, but they are idealistic.

1 They're deep thinkers in sustainability. Wise  
2 leaders. Inspirations to us all.

3 They have taught us that real organic  
4 farming is as much a way of life as it is a means  
5 of making a living. They taught me that I can be  
6 the change that I want to see in the world.  
7 After all, they were the change that we all  
8 wanted to see, and they are why we are here  
9 today.

10 Many young people are choosing this  
11 way of life.

12 CHAIRMAN CHAPMAN: Thank you.

13 Questions? Ashley?

14 VICE-CHAIR SWAFFAR: Thank you for  
15 your comments. I'm not going to ask you about  
16 hydroponics. I actually have a question about  
17 livestock from your comments.

18 Would you know anything about that?

19 MS. DIXON: I don't, I do cross work  
20 mostly. But I can put you in touch with the  
21 person who wrote the oxytocin comment I'm  
22 assuming.

1 VICE-CHAIR SWAFFAR: Yes.

2 MS. DIXON: That was hotly debated.

3 VICE-CHAIR SWAFFAR: Yes.

4 MS. DIXON: Among our farmer members.

5 VICE-CHAIR SWAFFAR: Thank you.

6 CHAIRMAN CHAPMAN: Harriet.

7 MS. BEHAR: So, as a beginning farmer,  
8 why did you choose soil-based agriculture instead  
9 of hydroponic?

10 MS. DIXON: Because all the organic  
11 farmers that I worked for were such heroes to me.  
12 I guess there's not a hero in the container  
13 movement that's an environmental hero. Maybe if  
14 there was one I would be onboard. But I do  
15 fundamentally believe that they are very  
16 different systems and like many people who have  
17 said to before me. I'm not going to go around  
18 damning container systems or hydroponic systems.  
19 They are just different systems.

20 CHAIRMAN CHAPMAN: Ashley?

21 VICE-CHAIR SWAFFAR: So I am going to  
22 ask you a question now.

1                   So I hear you talk about organic farms  
2                   and how they are better than hydroponic farms.  
3                   Is your farm certified organic?

4                   MS. DIXON: No, but we are in the  
5                   process of doing that right now because we have  
6                   moved our farm four times in the last seven  
7                   years. And we've been on land that previously  
8                   has been sprayed in those times. So it's been  
9                   very difficult for us to acquire land, but we are  
10                  quickly remedying that.

11                  CHAIRMAN CHAPMAN: Thank you. Up next  
12                  is Fred, followed by Madison Monte. Fred, start  
13                  with your name and affiliation for the record.

14                  MR. KIRSCHENMANN: Well, thank you,  
15                  I'm Fred Kirschenmann and I appreciate the  
16                  opportunity to speak to the Board. I was, as  
17                  probably most of you know, one of the first  
18                  National Organic standing Board members, and so  
19                  that was back a while.

20                  And I think that one of the issues  
21                  that I would like to bring to our attention is  
22                  that, I think that most of us tend to try to deal

1 with challenges that we're facing based on our  
2 current circumstances and how do we make the  
3 current circumstances a little better?

4 But I think it's important now, at  
5 least from my perspective, that we begin to  
6 recognize that we're going to make some major  
7 transitions now over the next 20 or 30 years.  
8 That's going to have a major impact on the way in  
9 which we produce our food.

10 And the major changes that we are  
11 going to see is that we have had now, for almost  
12 a century, a highly input-intensive kind of food  
13 and agriculture system. Whether those were  
14 synthetic inputs or natural inputs, it was very  
15 much moving in terms that we had those natural  
16 resources from which we could get those inputs,  
17 and then we would simply focus on maximum  
18 efficient production for short-term economic  
19 return.

20 And as we think, as we move forward  
21 into the future now, many of those inputs are  
22 simply not going to be available anymore. What

1 are some of them? They are fossil fuels. They  
2 are minerals. They are fossil water. They're,  
3 add into stable climates.

4 So we are going to see some major,  
5 major changes which is going to require us to  
6 really rethink our food system, and an input  
7 intensive system will no longer be possible for  
8 us. So we have to think about a food system that  
9 will become essentially self-renewing.

10 And there were, of course, people of  
11 great wisdom in our past, Aldo Leopold being one  
12 of them and already back in the 1930s he advised  
13 us that we should think about land health as the  
14 major focus. And by land, he meant the entire  
15 biotic community. Everything from microbes in  
16 the soil to us as humans. And as he said, we  
17 were not, we as humans were not the conquerors of  
18 the land community. We were simply plain members  
19 and citizens.

20 And we had to learn how to manage that  
21 natural system in terms of land health and land  
22 health, he said, was the capacity of land for

1 self-renewal. And that's the kind of future we  
2 have to think about as we don't have all these  
3 inputs.

4 And this is where, I think, the issue  
5 of soil becomes so important. Because if we are  
6 really looking at a food system that is self-  
7 renewing, then the microbes in the soil and the  
8 life in the soil are the basic foundation for the  
9 rest of the life of that land community.

10 And so I think for us to even consider  
11 within organic, to have a system that is not  
12 dependent on that self-renewing capacity, then  
13 this is the wrong direction for us. And we will  
14 find ourselves at some point in the future, no  
15 longer being able to adapt to that.

16 CHAIRMAN CHAPMAN: Thank you Fred.  
17 Emily?

18 MS. OAKLEY: One of the arguments that  
19 we've heard often from proponents of hydroponics  
20 is that we need hydroponics to feed a growing  
21 population and to supply the demand for organic  
22 food, but you are stating an opinion to the

1       contrary. That, in fact, we need soil-based  
2       organics because of the inputs that are heavily  
3       reliant in the hydroponic system. Is that  
4       correct?

5                   MR. KIRSCHENMANN: Well, first of all,  
6       I think there is a problem with that perception  
7       that you just said, that we need to produce more  
8       food in the future. We are currently producing  
9       enough food to feed 10 to 12 billion people. But  
10      with only 7 billion people, we've got almost 2  
11      billion that are chronically hungry.

12                   So it's not a question of adequate  
13      production, it's a question of poverty. It's a  
14      question of access. It's a question of a whole  
15      range of social issues that we have to address.

16                   And we also have to come to terms I  
17      think with as we think about if our human  
18      population continues to grow, all we have to do  
19      is figure out how to feed them, you know. How  
20      are we going to feed 9 billion people by the year  
21      2050 which is something that we hear all the  
22      time.

1                   And from my point of view, it's not if  
2                   the human population continues to grow. What we  
3                   have to come to terms with is another issue that,  
4                   although Leopold brought to our attention, that  
5                   is the problem of density of any species. And as  
6                   he pointed out, this is not just the density of  
7                   species out in the environment, it's also the  
8                   density of the human species.

9                   And as he pointed out, was that from  
10                  his observation, anytime that any species reaches  
11                  a density which it puts it out of the integrated  
12                  whole of, again, renewing the life of the whole,  
13                  then nature always reduces that density.

14                  And as he said, if one system fails,  
15                  she will find another. And so I think we have to  
16                  start thinking about our human population. Not  
17                  in terms of simply being able to feed them, but  
18                  the carrying capacity within again the land, the  
19                  health of the land as a whole and what our role  
20                  as humans are within that capacity.

21                  CHAIRMAN CHAPMAN: Harriet?

22                  MS. BEHAR: Do you think that the

1 Organic Food Production Act supports a self-  
2 renewing agriculture system?

3 MR. KIRSCHENMANN: I'm sorry, what?

4 MS. BEHAR: The Organic Food  
5 Production Act. Do you think that addresses  
6 some, kind of frames organic as self-renewing?

7 MR. KIRSCHENMANN: Well, you know,  
8 when I was on the National Organics Standards  
9 Board, there were several of us on the Board that  
10 felt that we should add soil health into the  
11 equation for a requirement for certification  
12 because we felt that was kind of foundational, at  
13 least at that point.

14 So we actually, the Board finally  
15 actually fully agreed to that. And so we put  
16 into our recommendation that soil health, the  
17 maintenance of soil health should be a  
18 requirement for certification.

19 And then, I didn't know this at the  
20 time, but when we forwarded that to the NOP and  
21 then they in turn forwarded it to the attorneys,  
22 and so the attorneys have to always approve of

1 these kinds of recommendations. And when they  
2 got it, they, the attorneys threw it out because  
3 they said regulations have to be answered with a  
4 yes or a no.

5 And soil health is too complex an  
6 issue. You can't answer that with a yes or a no.

7 And that's how we ended up with that,  
8 you could certify a product organically so long  
9 as it didn't use any synthetic inputs except  
10 those on the approved list that was a yes or a  
11 no.

12 And as long as you only use natural  
13 inputs except those on the unapproved list, that  
14 was a yes or a no.

15 So that's how we ended up with a  
16 certification system that was primarily based on  
17 the inputs rather than renewing the health of  
18 soil, which again, I think is pickative,  
19 particularly as we look ahead 20 years from now  
20 when we are not going to have all these natural  
21 inputs.

22 And, incidentally, there is another

1 resource I would highly recommend to anyone that  
2 questions the diminishing of resources, natural  
3 resources, in the future. And that's Ugo Bardi's  
4 new book called *Extracted*, which is now a Club of  
5 Rome study.

6 And he goes into more detail than  
7 anyone else that I know of. All these natural  
8 resources that we are not going to have available  
9 plus in the future.

10 So we really have to rethink about the  
11 whole way in which we as humans are going to live  
12 on the planet to make it more self-renewing  
13 system.

14 CHAIRMAN CHAPMAN: Thank you Fred. I  
15 have to stop you there. We are going to move on,  
16 given our time, but Fred, thank you for your  
17 comments.

18 Up next is Madison followed by Mark  
19 Kastel. Madison, if you could start with your  
20 name and affiliation.

21 MS. KEMPNER: Okay. New name. My  
22 name is Maddie Kempner, now. And I'm here on

1       behalf of the Northeast Organic Farming  
2       Association of Vermont.

3                   I want to start by sincerely thanking  
4       you all for your hard work and for this  
5       opportunity to address the Board, and I'd like to  
6       comment today on the crux of the Committee's  
7       proposal on hydroponics and container production.

8                   Normally when I address the Board, I  
9       try to give a balanced representation of the  
10      views of our members and certified farmers, but  
11      since so many of our certified farmers are here  
12      in person this week, I guess I can just speak for  
13      myself.

14                   As I've testified many times, NOFA  
15      Vermont and Vermont Organic Farmers believe  
16      organic production means in the soil, in the  
17      ground.

18                   You've heard a lot of testimony this  
19      afternoon from hydroponic and container producers  
20      around some of the reasons they have adopted  
21      these production methods, such as limited land  
22      base or water scarcity.

1                   These may all be perfectly good  
2 reasons to use hydroponic growing methods, but  
3 they are not reasons that that production should  
4 be called organic.

5                   Hydroponic production may be an  
6 appropriate response to certain site-specific  
7 limitations or challenges, but it is not the  
8 response we need to address the greater crises of  
9 our time, such as climate change, declining bio-  
10 diversity and protecting and replenishing a  
11 threatened and depleted supply of clean water.

12                  Organic as a whole eco-system approach  
13 to agriculture is the answer, and it starts with  
14 soil. Increasingly, we are beginning to  
15 understand the immense potential of soil to  
16 sequester carbon and reverse climate change.

17                  For generations, organic farmers have  
18 worked tirelessly to build soil health, fertility  
19 and biology. Looking to the future, that soil  
20 and that knowledge is exactly what we need to  
21 meet the ecological challenges of our time.

22                  Some have argued that to say organic

1 growing needs to be in the soil represents an  
2 antiquated way of thinking. That it's anti-  
3 innovation and close-minded and stubborn.

4 As a bona fide millennial, I am here  
5 to argue exactly the opposite, except maybe the  
6 stubborn part.

7 I want to argue that soil is not only  
8 the foundation of organic, it is also the future  
9 of organic.

10 Thank you.

11 CHAIRMAN CHAPMAN: Thank you. That  
12 was quick.

13 MS. KEMPNER: Yes, I didn't expect it  
14 to be that short. Feel free to ask questions.

15 CHAIRMAN CHAPMAN: Questions? Dave?

16 MR. MORTENSEN: Yes, I appreciate your  
17 comment about being a millennial. I teach and  
18 work with a lot of young folks and I've been  
19 surprised on the public comments that I've heard  
20 the pro-hydro folks saying, you know, this is a  
21 young person's thing. And in soil is an old  
22 person's thing. I mean I've heard it several

1 times.

2                   Could you talk a little bit more about  
3 your perception of your generation's view on  
4 sustainability and resource use and stewardship?

5                   MS. KEMPNER: No pressure. Yes, I'd  
6 be happy to.

7                   MR. MORTENSEN: Just in general.

8                   MS. KEMPNER: Yes. No, absolutely.  
9 Thank you for the question.

10                   I think there are a lot of folks who  
11 argue that hydroponic is an innovative growing  
12 method and I think it's attractive to a lot of  
13 young farmers because they're often, have more  
14 trouble accessing land.

15                   And so it's a growing method that  
16 allows production in areas where there is limited  
17 land access or where land is really not  
18 affordable to new farmers. And I really, as a  
19 young person who has farmed, I empathize with  
20 those challenges.

21                   Again, it doesn't make it organic.  
22 And I don't think that it's really taking the

1 long view. I think that soil, like I said,  
2 research is increasingly showing the potential of  
3 soil to reverse climate change. And I think  
4 that's also something that my generation is  
5 really focused on and trying to attack head-on.

6 And by maintaining organic production  
7 as a growing method that values soil, I think  
8 that's one way of taking the long view, I guess,  
9 and maintaining organic as a system that really  
10 represents ecological regeneration and true  
11 sustainability.

12 MR. MORTENSEN: Thank you.

13 CHAIRMAN CHAPMAN: Emily?

14 MS. OAKLEY: One of the Vermont  
15 farmers, Davey Miskell, who spoke, said you have  
16 a hard time getting young and beginning farmers  
17 to get certified organic. I'm wondering if you  
18 share that view and what we might do to try to  
19 reverse that trend.

20 MS. KEMPNER: Yes, I think that's  
21 another really good point. And I do see that  
22 trend. And I, one of my colleagues actually

1 recently compared the view of a lot of young  
2 people, and I don't mean this in a disparaging  
3 way at all, but compared that to sort of younger  
4 generations' views on feminism, where, you know,  
5 I grew up in a world where relatively speaking,  
6 women do have a lot of equal opportunities and  
7 are able to pursue dreams and goals.

8           And so it's easy to sort of disregard  
9 or forget all of the ground work that was laid in  
10 the feminist movement and in creating that  
11 relative equality. And I think for young farmers  
12 it's often kind of the same situation where they  
13 come into farming with a lot of the same values  
14 of ecological stewardship and a lot of the same  
15 sort of approaches that older farmers take. But  
16 they almost in some ways and, again, not to be  
17 disparaging, may take that for granted. And may  
18 not feel that certification is necessary because  
19 they do feel like yes, I'm meeting those  
20 standards.

21           And maybe they're doing a lot more  
22 direct sales so their customers know that. So I

1 think probably really more education about what  
2 organic means and also maintaining the integrity  
3 of organic is really important for its future.  
4 And I think by allowing in more technologies that  
5 don't really meet the spirit of what organic is  
6 supposed to be, I think it puts it further at  
7 risk actually, rather than making it more  
8 attractive to young farmers.

9 CHAIRMAN CHAPMAN: Thank you.

10 MS. KEMPNER: Thank you.

11 CHAIRMAN CHAPMAN: Up next is Mark  
12 Kastel followed by Jim Gerritsen. Mark, if you  
13 could start with your name and affiliation for the  
14 record?

15 MR. KASTEL: Hi, I'm Mark Kastel. I'm  
16 the Co-director of the Cornucopia Institute and a  
17 former certified organic fresh market vegetable  
18 producer.

19 This meeting is your chance to end  
20 corruption at the National Organic Program.  
21 Here's the pattern.

22 During the Bush Administration, we

1 discovered that Big Pharma was adding genetically  
2 mutated DHA algae oil to organic infant formula  
3 and formal complaints were filed.

4 Career civil servants at the NOP sent  
5 a letter to the certifier involved, stating it  
6 appeared to be illegal and to explain. Instead,  
7 they lawyered up and went to the NOP director,  
8 who ordered the staff to retract their letter.

9 This corrupt decision was reversed  
10 during the Obama Administration and the NOP, the  
11 NOSB put the material on the National list. With  
12 an annotation. It could not be processed with  
13 Hexane. But in a big favor to the industry,  
14 since there's no Hexane-free DHA oil, years  
15 later, the rule has never been published.

16 When the country -- turned down by two  
17 certifiers when they wanted to certify a small  
18 porch as quote, outdoor access, the NOP director  
19 at the time overturned the certifier, and ordered  
20 them to certify the porch. Also illegal. DHA  
21 legal. This is illegal.

22 As both the USDA and corporate

1 lobbyists pay lip service to the deliberative  
2 process at the NOSB, three materials including  
3 whey protein isolate, where voted off the list  
4 unanimously but when the draft rule was  
5 published, one sentence from the lobbyists at the  
6 OTA overruled the entire Board and the entire  
7 public process, sunset process. Legal, but  
8 unethical.

9 Now you folks have a decision about  
10 hydroponics. OFPA is clear. It requires, quote,  
11 careful fostering of soil fertility. It's  
12 required by the law. How can you foster soil  
13 fertility without soil?

14 But a past NOP director, in a secret  
15 collusion with some of the largest certifiers,  
16 quietly allowed giant industrial operations to  
17 start producing organic products hydroponically,  
18 many in containers, quote, containers. Illegal.  
19 Organic consumers are becoming more  
20 sophisticated. Many want to purchase organic  
21 foods not just because they are produced without  
22 toxic chemicals, but because of the superior

1 flavor and nutrition. You don't have the right -  
2 there's a slide show on that tape. It's not  
3 playing. Okay. I hope you will give me a few  
4 more seconds since we are having technical  
5 difficulties.

6 So this is your chance to protect the  
7 true meaning of organics, rather than making it a  
8 mere marking slogan. Like the EU, we call on you  
9 to reject the potential rulemaking that would  
10 legislate and legalize hydroponics and container  
11 growing.

12 Instead, please make the bold  
13 statement, asking the USDA to enforce OFPA and  
14 the current regulations.

15 CHAIRMAN CHAPMAN: Thank you Mark.

16 MR. KASTEL: Otherwise, I went over  
17 just a couple.

18 CHAIRMAN CHAPMAN: Thank you Mark.

19 MR. KASTEL: Thank you.

20 CHAIRMAN CHAPMAN: Any questions for  
21 Mark?

22 MR. KASTEL: To address, Ashley, if

1 you have a question concerning organic livestock,  
2 I run that team at Cornucopia.

3 VICE-CHAIR SWAFFAR: Great. Okay,  
4 I'll ask you that, Mark. So on your comments on  
5 oxytocin, you said that you would support their  
6 relisting but only with an annotation --

7 MR. KASTEL: Can you talk closer to  
8 the microphone? I can't hear you.

9 VICE-CHAIR SWAFFAR: Okay. So on the  
10 oxytocin, you said that you would support  
11 relisting with an annotation. And we heard from  
12 a lot of farmers that they don't need it. Did  
13 you hear from a lot of your members that they  
14 needed it?

15 MR. KASTEL: We heard from some that  
16 it was an important post-reproduction tool. We  
17 heard from some, we heard from many farmers that  
18 said they don't require and they don't need it  
19 and use alternatives.

20 If you read our comments, we want to  
21 make sure that there's really rigorous and robust  
22 language that would control its usage because

1 there is a history with oxytocin of abuse being  
2 used as a production tool.

3 And that would be obviously contrary  
4 to a philosophy of organic, caring for your  
5 cattle in a natural manner. And would not be  
6 consistent with consumer expectations that  
7 hormones are not used in organic livestock  
8 production.

9 CHAIRMAN CHAPMAN: Harriet?

10 MS. BEHAR: You are aware that the  
11 livestock subcommittee voted to remove oxytocin  
12 from the National list and so would you support  
13 that as the Chair of Cornucopia?

14 MR. KASTEL: We wouldn't vigorously  
15 oppose that and our information, our testimony  
16 was for information trying to deliver a message  
17 for some of the livestock producers out there.  
18 Dairy producers who voiced a preference.

19 We went out with a questionnaire to  
20 our membership and that was the response we got  
21 from probably a minority but a sizable minority  
22 of the comments that we received back.

1                   CHAIRMAN CHAPMAN: Lisa?

2                   MS. STOKKE: Can you just quantify in  
3 numbers what that sizable minority --

4                   MR. KASTEL: I'm sorry, I don't have  
5 that with me.

6                   MS. STOKKE: Okay.

7                   CHAIRMAN CHAPMAN: Dave and Ashley,  
8 we'll have to stop it there.

9                   MR. MORTENSEN: Mark, you covered a  
10 number of subjects during the course of the three  
11 minutes, and could you give us a sense and,  
12 again, I'm big on mental sensitivity analyses.  
13 What is the scope of the hydroponic decision in  
14 relation to some of the other things you covered  
15 in its importance?

16                   MR. KASTEL: Well, I'll give you two  
17 macral aspects to your question.

18                   MR. MORTENSEN: Thank you.

19                   MR. KASTEL: One, and I'm sorry the  
20 slide show didn't work. The scale of these  
21 production facilities is not illustrated by this  
22 oral comment. It's mind boggling.

1                   These are some of the largest multi-  
2 million dollar complexes with many, dozens of  
3 acres under glass. Most of the hydroponic  
4 production in America today comes from the desert  
5 Southwest and Mexico. It comes from Holland and  
6 other countries where it is illegal to label in  
7 those countries.

8                   So organics was formed, when I got  
9 involved in organics as both a grower and then  
10 doing consulting work for some of the larger  
11 farmer cooperatives and the Farmers' Union.

12                   This was an economic justice vehicle.  
13 Family farmers have been crushed. This was an  
14 opportunity to have a more loving and respectful  
15 relationship with our customers.

16                   So we've been rewarded for, these  
17 folks are riding our tail. They want the  
18 marketing cache of the organic label without  
19 doing the heavy lifting. And this dovetails into  
20 your other aspect of your question.

21                   We know why consumers first come to  
22 organic food. And it's selfish. And there's

1 nothing wrong with that. It's hard-wired into  
2 the, it's all brain stemming. Chemistry. We  
3 want the safest and most nutritious food for our  
4 families. Children are involved. Very  
5 emotional.

6 We used to fight other peoples over  
7 hunting lands and gathering rights. But we are  
8 seeing more and more, a higher percentage of  
9 organic consumers are becoming sophisticated  
10 enough to understand the differences between  
11 nutritional content in organic food, both in  
12 livestock and crop production.

13 I'd like to cite one study that the  
14 USDA conducted in 1950 that was replicated in  
15 1999. They looked at the essential nutrients in  
16 fruits and vegetables and they have found that a  
17 third of them went down as much as a third during  
18 that 50 year period. That's one of the reasons  
19 people turn to organic foods, is they think they  
20 are paying a premium for a premium superior  
21 product. And just eliminating toxic chemicals  
22 and growing them in a semi-inert media and liquid

1 fertilizer isn't organic. I hope that answers  
2 your question.

3 MR. MORTENSEN: Thank you.

4 CHAIRMAN CHAPMAN: Thank you Mark.  
5 Ashley? No? You're good? Okay. Thank you  
6 Mark.

7 MR. KASTEL: Thank you very much. And  
8 I have 5,000 signatures here, a very high  
9 percentage from farmers who would ask you to pass  
10 a resolution supporting OFPA instead of what's on  
11 the table right now.

12 CHAIRMAN CHAPMAN: Up next we have Jim  
13 Gerritsen followed by Johanna Mirenda. Right now  
14 we are running 40 minutes behind. Jim, we can  
15 start with your name and affiliation? Is Jim's  
16 mic on?

17 MR. GERRITSEN: Okay. Jim Gerritsen,  
18 I'm a farmer on Wood Prairie Family Farm in  
19 Northern Maine.

20 CHAIRMAN CHAPMAN: Go ahead Jim.

21 MR. GERRITSEN: Okay. We've been  
22 farming for over 40 years. We farm 56 acres.

1 Our primary cash crop is organic seed potatoes  
2 which is a crop that is hard on the soil. For  
3 that reason, we have a long rotation, and at any  
4 one time two-thirds of our soil is in cover  
5 crops. And at this moment, every bit of our land  
6 is in cover crop, including land that we finished  
7 harvesting potatoes on three weeks ago. So we  
8 value soil, as my friend Jack Lazor says, if you  
9 treat the soil well, the soil will treat you  
10 well. And that's our motto that we live by.

11 So, I am circulating around a piece by  
12 Bart Hall-Beyer, a colleague who was not able to  
13 make it here, but he's an experienced farmer and  
14 inspector who has inspected almost a million  
15 acres and his believe is that hydroponic  
16 operations are inherently un-inspectable, and I  
17 think it's important that you consider that.  
18 Those are his comments and I am presenting them,  
19 handing that to you on his behalf.

20 What I want to relate, we've been  
21 farming 40 years. In addition to that, I served  
22 as a volunteer on the MOFGA Certification

1 Committee for 25 years. So I would make,  
2 probably, monthly, 300 mile round trip meetings  
3 for 25 years. And one of the things, when I  
4 started in the mid-80s, I was on a subcommittee  
5 that was giving input to Kathleen Merrigan  
6 working in Senator Leahy's office, and coming up  
7 with the OFPA language for the Organic Foods  
8 Production Act.

9 What was plain to all of us working on  
10 that was that soil was the foundation of organic.  
11 And I think that the various problems that we  
12 have in organic today comes from a failure of the  
13 National Organic Program to live by the spirit  
14 and the letter of OFPA and I think if they would  
15 do that, then a lot of these apparently  
16 complicated problems would go away.

17 So I think a lot of the problem has  
18 been the NOP's failure to enforce OFPA. I think  
19 OFPA was a very well done, not perfect, but a  
20 very well done law, and I think proper  
21 enforcement would resolve this. And that means  
22 the spirit of OFPA is in the soil in the ground.

1 And I think that's what the NOSB should be  
2 supporting, and I think that's what NOP should  
3 have been enforcing themselves right along. And  
4 I think the mess we're in now is because the USDA  
5 made a gross mistake in interpreting that  
6 hydroponics was okay maybe ten years ago.

7 And now we're on a slippery slope and  
8 I think we have a real problem trying to correct  
9 this basic mistake. But ultimately NOP needs to  
10 enforce OFPA.

11 CHAIRMAN CHAPMAN: Thank you Jim.  
12 Emily?

13 MS. OAKLEY: So the same question.  
14 You don't support the compromise position of  
15 container growing definition or motion?

16 MR. GERRITSEN: I support OFPA and the  
17 spirit of OFPA is in the soil in the ground. So  
18 if I were a member of the NOSB, what I would do  
19 is make a motion on a non-substantial change as a  
20 substitution and encourage the USDA NOP to  
21 enforce OFPA and that includes in the soil, in  
22 the ground.

1                   CHAIRMAN CHAPMAN: Harriet?

2                   MS. BEHAR: I find this test written  
3 testimony by Bart Hall very interesting, having  
4 been an organic inspector myself and I had not  
5 really thought about that. Because it's relying  
6 just on liquid inputs and three days before the  
7 inspector shows up, you just take the other stuff  
8 out and bring the organic in. Because I know I  
9 spent many, many hours out there in the field and  
10 I carried a little trowel and we dug around. I  
11 mean, we were in the soil and that was a very  
12 important part of the organic inspection was  
13 really looking at the soil.

14                   So I just find that somewhat  
15 compelling and something I hadn't thought of.

16                   MR. GERRITSEN: That's why I'm sharing  
17 it. Bart had hoped to make this meeting and he  
18 wasn't able to, and I thought the content of that  
19 is so important in your consideration. I don't  
20 think it's enforceable if it's passed.

21                   CHAIRMAN CHAPMAN: Thank you Jim. Up  
22 next is Johanna, followed by Lisa Stokke.

1 Johanna, you can start with your name and  
2 affiliation.

3 MS. MIRENDA: Good afternoon. My name  
4 is Johanna Mirenda. I'm the technical director  
5 at OMRI, the Organic Materials Review Institute.  
6 To start my comments, I'll reiterate one issue  
7 from our written comments regarding the handling  
8 subcommittee's proposal to change the  
9 classification of potassium acid tartrate from a  
10 non-agricultural synthetic substance to an  
11 agricultural non-synthetic substances, and move  
12 the substance from 605 feed to 606.

13 OMRI agrees with that proposal to  
14 classify potassium acid tartrate as an  
15 agricultural substance and a non-synthetic  
16 substance. This decision aligns with the  
17 policies and definitions provided by the NOP in  
18 the Final Guidance on Classification of  
19 Materials.

20 We encourage the NOSB's continued use  
21 of these guidance documents on the classification  
22 of materials to assess petition materials and to

1 evaluate listed materials during sunset. Your  
2 activities in this regard are essential to bring  
3 accuracy and consistency to the classification of  
4 Nationalist materials as synthetic or non-  
5 synthetic agricultural or non-agricultural.

6 And to end my comments, I'll mention  
7 one thing regarding the inerts working group. At  
8 the Fall 2015 meeting, the NOSB passed a  
9 recommendation to revise the annotation for  
10 inerts on the National list and at long last,  
11 finally resolved the pesky annotation referencing  
12 EPA List 3 and 4 which have been obsolete for  
13 over a decade.

14 The inerts working group made regular  
15 updates at these meetings in preparation for that  
16 recommendation so I'm respectfully encouraging  
17 the Board to continue updating the organic  
18 community with the progress of implementing that  
19 recommendation. Thank you.

20 CHAIRMAN CHAPMAN: Harriet, then Dan.

21 MS. BEHAR: I warned you about this.

22 MS. MIRENDA: I'm ready.

1 MS. BEHAR: So tobacco dust, nicotine  
2 sulfate, is on the 602 as a prohibited natural in  
3 cross-production. However, if it's growing in a  
4 field, somebody could be using as a cover crop or  
5 could that be done? How about a compost feed  
6 stock? And how about as a para -- an external  
7 parasiticide for livestock? Would any of those  
8 uses be allowed in OMRI's point of view?

9 MS. MIRENDA: In terms of growing  
10 tobacco and tilling it into the soil, from OMRI's  
11 perspective, just based on general conversation,  
12 not something that's come across our organization  
13 for formal decision, but that seems totally  
14 allowable by the standard. Whereas an input  
15 material formulated with tobacco dust or any  
16 other type of material that could be assessed  
17 under the Standard of Identity of tobacco dust,  
18 nicotine sulfate, that would be prohibited as a  
19 crop input material.

20 MS. BEHAR: Compost feed stock?

21 MS. MIRENDA: As a compost feed stock,  
22 we I believe OMRI has seen whole tobacco leaves

1 used as a compost feed stock and we generally did  
2 not think that was a prohibited use, dictated by  
3 205-602. Part of the discussion is some concern  
4 about the Standard of Identity of what is on the  
5 National list as tobacco dust is being  
6 prohibited.

7 My understanding of the NOSB's  
8 deliberations in developing the National list is  
9 that nicotine derivatives were being discussed as  
10 the prohibited natural material but what we see  
11 on the National list now is tobacco dust.

12 So this could be a good candidate for  
13 a technical report to get a really firm grasp on  
14 the many different materials that might be  
15 commercially available and which ones are  
16 specifically prohibited by that listing on 602.

17 CHAIRMAN CHAPMAN: Thank you. Dan?

18 MS. MIRENDA: For livestock use? It's  
19 a non-synthetic, not on 604 allowed.

20 CHAIRMAN CHAPMAN: Dan.

21 DR. SEITZ: Occasionally I hear that  
22 with hydroponic operations there are materials or

1 inputs used that are proprietary. And just as  
2 someone who's not in the field as a public  
3 member, are the materials that you sell, are they  
4 proprietary in terms of what the formulations are  
5 or would someone buying them know exactly what's  
6 in the material that you sell but the person who  
7 uses the product might not wish to divulge its  
8 contents.

9 So I'm just trying to understand how  
10 proprietary works in terms of your products or  
11 someone who might be using them in their  
12 operation.

13 MS. MIRENDA: Sure. So when a input  
14 manufacturer applies to OMRI for verification,  
15 they're required to disclose in full their entire  
16 formulation, including the full manufacturing  
17 process of every ingredient.

18 So OMRI knows all of that proprietary  
19 information. One of the benefits of applying to  
20 OMRI is that we keep that confidential as opposed  
21 to that manufacturer going to every certifier,  
22 giving their information, and every certifier

1 making their own determination.

2 So OMRI keeps that information  
3 confidential and in place we publish all our  
4 policies for how we evaluate brand name materials  
5 on our website and in our Standards manual so  
6 that our, the process for our decision-making is  
7 transparent but the individual formulations are  
8 protected.

9 DR. SEITZ: So are you saying that if  
10 a certifier wanted to know what was in this  
11 substance, the product, they would not have  
12 access to that. They take on faith through the  
13 procedure that you have published that, indeed,  
14 it doesn't have any prohibited substances.

15 MS. MIRENDA: That's correct. And our  
16 contracts include a clause that, should the NOP  
17 require OMRI to disclose information in order to  
18 resolve a conflicting materials decision or to  
19 assess our practices that they're in line, that  
20 we will share that information with the NOP.

21 CHAIRMAN CHAPMAN: Thank you.

22 MS. BAIRD: I do have to follow up on

1 that. If a manufacturer applies to a certifier  
2 and they would reveal that proprietary  
3 information to that certifier as well. Not  
4 necessarily just to you. I think there's  
5 misconception there. Certifiers, if they apply  
6 to an individual certifier, they do have to  
7 supply that proprietary information.

8 MS. MIRENDA: Yes, that's true.

9 CHAIRMAN CHAPMAN: Thank you. Up next  
10 is Lisa, followed by Michael Bessencon. Lisa, if  
11 you can start with your name and affiliation for  
12 the record.

13 MS. STOKKE: Thank you Tom. My name  
14 is Lisa Stokke and I'm a Founder and Executive  
15 Director of Next7.org. And you will see on the  
16 screen behind you the number of people that I'm  
17 here to represent. It says 86,269 people and  
18 counting because it's going up rapidly by the  
19 minute. We've actually gotten 70,000 in the last  
20 24 hours, just alone, to say that they care about  
21 this issue.

22 So I'm going to tell you about the

1 petition and what it is, since I am here to  
2 represent exactly what this community of people  
3 have signed.

4 It says, we stand with the community  
5 of organic farmers and consumers that rely upon  
6 organic food and agriculture for not only the  
7 nutritious and clean food that it provides, but  
8 also as the solution for a sustainable future  
9 through regenerative agricultural practices.

10 The organic farmers that pioneered the  
11 organic revolution decades ago did so in the  
12 interest of our health and that of the soil,  
13 plants, water and animals to create a system of  
14 agriculture we can pass down to the next  
15 generations.

16 Organic consumers understand that when  
17 they purchase organic food, it is an investment  
18 in our future, our planet, and their personal  
19 health. All of which are interdependent and  
20 inseparable. What we do to the Earth, we do to  
21 ourselves. Which is why so many people have  
22 chosen to eat organic food for the promise of a

1 hopeful future for ourselves and also Earth.

2 The currently permitted organic  
3 certification of hydroponically grown food in  
4 recent years has deceived consumers as it is not  
5 grown in the soil and in accordance with  
6 traditional nor certifiable organic practices.  
7 Consumers have come to expect and rely upon  
8 healthy food grown in the soil when they buy  
9 organic which is based upon the regulatory  
10 framework in partnership with organic farmers in  
11 the U.S.

12 It is disingenuous at the very least  
13 to allow the production and sale of this food as  
14 organic. Hydroponic food does not meet organic  
15 standards as set forth by organic farmers and  
16 subsequently passed NOS feed boards and the  
17 National Organic Program. Allowing hydroponics  
18 to be certified as organic erodes the public  
19 trust and the organic label and is a great  
20 disservice to the farmers whom we rely upon.

21 OFPA specifically states, an organic  
22 plan shall contain provisions designed to foster

1     sole fertility primarily through the management  
2     of the organic content of the soil through proper  
3     tillage, crop rotation and manuring.

4             Hydroponically grown food, plants that  
5     receive their primary nutrients through an  
6     artificial feeding tube instead of the fertility  
7     health and vitality of the soil, are not  
8     qualified to be certified as organic and  
9     therefore should not be.

10            CHAIRMAN CHAPMAN: Thank you Lisa.

11     Any questions for Lisa? Thank you Lisa.

12            MS. STOKKE: Thank you for your time.

13            CHAIRMAN CHAPMAN: Up next is Michael,  
14     followed by Jeff Moyer. Michael, if you'd start  
15     with your name and affiliation for the record.

16            MR. BESANCON: Thanks for the  
17     opportunity to speak to you. My name is Michael  
18     Besancon. I'm representing Patagonia and 17  
19     other brands of organic, organic brands in the  
20     industry.

21            Personally, this is my 48th year  
22     selling organics. My last position when I

1 retired was Senior Global Vice President of  
2 Purchasing, Marketing, and Distribution for Whole  
3 Foods Market.

4           It's our believe that the inclusion of  
5 hydroponic in the organic label is detrimental to  
6 the label and I think that there's, the  
7 conversation that I've heard today is compelling.  
8 And the soil and the farmers and all of those  
9 issues. But for me there's an overriding issue  
10 here on the damage that this will do.

11           And that is that we all, in the room,  
12 or many of us in the room, has our personal brand  
13 or our company's brands or associations are  
14 organic. And that brand is at risk. We keep  
15 talking about a movement but, in a label, but  
16 organic is more than that.

17           Organic is a brand. It's a stand-  
18 alone brand. And every marketer will tell you  
19 that when the consumer loses confidence in the  
20 brand, the sales go down. We see it all the  
21 time.

22           And the, currently, my experience

1       anecdotally, with farmers, with consumers, with  
2       vendors, is there is a lack of confidence in the  
3       brand. And I think it's incumbent and essential  
4       that this organization, this Board, protect the  
5       brand for all of the people in the room and all  
6       the people who are in the organic business, that  
7       they don't lose their livelihoods and lose  
8       something that's incredibly important in, not  
9       sustainability, but the regeneration of the  
10      planet.

11                   That's the obligation that we have.  
12      That's the obligation that I believe you have.  
13      And that's what we are asking you to do, is to  
14      exclude hydroponics from the organic label, the  
15      organic brand. Thank you.

16                   CHAIRMAN CHAPMAN: Francis?

17                   DR. THICKE: Could you tell us what  
18      other organizations are on your letter that  
19      you're talking about?

20                   MR. BESANCON: Sure. There's 17 of  
21      them. There's Amy's Kitchen, Nativa, Nature's  
22      Path, Patagonia, Allison Organics, Dan Barber,

1 Blue Hill, Stone Barn, Demeter, Dr. Bronner's,  
2 Elemental Herbs, Frontier, you know, I could go  
3 on. There's a bunch. And there would have been  
4 a whole lot more if we would have had more time.

5 I could have put personally 20 more  
6 on.

7 CHAIRMAN CHAPMAN: Dave.

8 MR. MORTENSEN: Michael, could you  
9 give us an example of where a brand loses  
10 integrity and sales drop. It's not an area of my  
11 familiarity. Could you just give an example or  
12 two of that?

13 MR. BESANCON: Well, one that's not  
14 related but is sort of is Chipotle. What, they  
15 had a 40 percent drop in share price over the  
16 question of integrity in their operation. The  
17 integrity and safety of their food that they  
18 sell.

19 And that happens all over the place.  
20 If you lose your mission, then you, I could site  
21 another one but I won't. It just changed hands  
22 and it has a great deal to do with the integrity

1 of the mission.

2 CHAIRMAN CHAPMAN: Thank you. Michael,  
3 I have a question for you. Your letter mentioned  
4 hydroponics. We're talking about a range of  
5 operations here from aeroponics, hydroponics,  
6 potting soils, soil. Where in that spectrum are  
7 those 17 companies drawing the line?

8 MR. BESANCON: In the soil.

9 CHAIRMAN CHAPMAN: In the soil in the  
10 ground?

11 MR. BESANCON: In the ground.

12 CHAIRMAN CHAPMAN: So they do not  
13 support crop subcommittee proposal?

14 MR. BESANCON: You know, I've heard  
15 other folks answer that question, and somebody  
16 who has the knife that's cutting themselves in  
17 half, can I borrow it?

18 The issue for me is that I would be,  
19 my preference, and I believe the preference of  
20 most of these folks, is that it be in the soil,  
21 in the ground.

22 But I'm a realist. If we have to

1       compromise, then we would accept the compromise  
2       and that's what the letter says.

3                   CHAIRMAN CHAPMAN: Thank you. Thank  
4       you for your testimony. Up next we have Jeff  
5       Moyer followed by Roger Noonan. Jeff, you can  
6       start with your name and affiliation.

7                   MR. MOYER: Certainly. Jeff Moyer,  
8       Executive Director of the Rodale Institute, dairy  
9       farmer, and past member of the NOSB.

10                   Members of the NOSB, the NOP and all  
11       those in attendance, thank you very much for your  
12       commitment to the organic community and for  
13       allowing me to have a few minutes of your time to  
14       comment on the issue of hydroponics as a  
15       certified organic production system.

16                   I'll try to make my few points fairly  
17       simple and straightforward. Organic is about  
18       soil. Since the word organic was first linked to  
19       agriculture it has always been about the soil.  
20       Why is healthy organic soil so important? I  
21       challenge all you to Google search the word  
22       ergothionein. It's the most powerful antioxidant

1 known to man, only produced by soil fungus and a  
2 few mushrooms.

3           Soil health is not only discussed in  
4 organic circles, but now conventional farmers  
5 have heard our message and are beginning to  
6 listen to what we talk about. At the same time,  
7 organic is beginning to talk about farming  
8 without the soil. Seems a little ridiculous.

9           Now, I'm not a lawyer, nor was anyone  
10 else on the NOSB who helped write the 2010  
11 recommendation. But we were pretty clear that  
12 the idea of growing terrestrial plants without  
13 soil isn't organic. Now some folks are trying to  
14 redefine the word hydroponic to make us believe  
15 that what they're doing is container growing to  
16 confuse the issue, I suppose so lawyers can fight  
17 about it.

18           We saw the same pattern happen when I  
19 was on the Board with Organic Dairies. Organic  
20 is not about efficiency or reducing the amount of  
21 farmland used in production. A more efficient  
22 way to raise dairy animals is to simply

1 substitute organic feed for conventional feed,  
2 fill the cow's stomach with inert materials like  
3 is happening in the conventional world now using  
4 spent substrate from hydroponic operations.

5 And there are more effective water use  
6 systems in dairy production than managing cows on  
7 pasture, yet organic dairy industry works  
8 diligently to facilitate cows that act like cows  
9 and express their natural habits of being social,  
10 eating grass outdoors on green pastures. Yes,  
11 even cows need to be connected to the soil.

12 Organic is not about a one-to-one  
13 substitution. Many farmers new to organic ask  
14 this simple question all the time. I can't spray  
15 X so can I spray Y?

16 Always looking for that one-to-one  
17 substitution of materials. And certifiers will  
18 tell them over and over, it's not about  
19 substitution of materials, it's about a systems  
20 approach.

21 Now we want to say one-to-one  
22 substitution of conventional nutrient soup for

1 organically sourced materials is really organic.  
2 I can't believe it.

3 We needed lawyers to define pasture  
4 even though school-age children could do it. Now  
5 we are going to need lawyers to define  
6 hydroponics and container growing, even soil.  
7 When school children can do it without any  
8 hesitation.

9 Hydroponics in any way you describe  
10 it, is many things, but it is not organic. Thank  
11 you.

12 CHAIRMAN CHAPMAN: Any questions?  
13 Steve, and then Dan and then Francis and we will  
14 have to end it there.

15 MR. ELLIOTT: So could you describe in  
16 your opinion the difference between carbon  
17 sequestration and nutrient cycling between  
18 container hydro, I won't define that for you, and  
19 soil?

20 MR. MOYER: Well, clearly, I'm not the  
21 person to stand here and give you the data on  
22 that. We have a lot of data from our long-term

1 farming systems trials along with data from other  
2 long-term systems trials at the USDA at the  
3 University of Wisconsin and Iowa State that all  
4 support the claim that farming organically  
5 sequesters carbon even when conventional systems  
6 don't in those same soil types.

7 No till is not a solution for that.  
8 Even -- at Ohio State will tell you that no till  
9 doesn't sequester more carbon. It maybe will  
10 hold onto the carbon you have at the very best,  
11 but it doesn't do anything to sequester  
12 additional carbon.

13 When you are looking at hydroponics or  
14 a container growing, if there is no soil in  
15 there, you are not sequestering carbon. The  
16 plant itself doesn't sequester carbon. It's the  
17 complex interaction between the plant and the  
18 microbiology in the soil that actually does the  
19 sequestration. So no soil, no carbon  
20 sequestration.

21 CHAIRMAN CHAPMAN: Thank you. Dan?

22 DR. SEITZ: You mentioned an

1 antioxidant that's found only in the soil and  
2 presumably, the implication there is that the  
3 food grown on that soil may also then absorb  
4 that, in that someone eating that produce would  
5 benefit from that. And I'm just wondering if you  
6 have information on the comparative nutritional  
7 content of hydroponics versus organically soil-  
8 based grown produce.

9 MR. MOYER: I do not.

10 DR. SEITZ: And would you know whether  
11 such information is available, or is this  
12 something, an area that has not yet been  
13 researched very extensively?

14 MR. MOYER: Clearly, I haven't done a  
15 literature review on that topic so I would have  
16 to say I don't know.

17 DR. SEITZ: Okay, no problem.

18 CHAIRMAN CHAPMAN: Thank you.

19 Francis.

20 DR. THICKE: Jeff, recently some of  
21 the large scale hydroponic producers have been  
22 saying that if they use some plant material as

1 their substrate instead of fully inert, that  
2 they're no longer hydroponic, even if they are  
3 using 100 percent liquid feed, they are now  
4 container growers.

5           You being on the 2010 Board, Chair of  
6 that Board, is that in the spirit of that 2010  
7 recommendation for hydroponics, that recommending  
8 prohibition of hydroponics, is it clear to you?  
9 That if it's you're using 100 percent liquid feed  
10 but you are in coconut coir for example, would  
11 that have been considered to be hydroponic in the  
12 2010 recommendation?

13           MR. MOYER: It would have been  
14 considered hydroponic and it would not have been  
15 considered organic. That's correct.

16           DR. THICKE: Thank you.

17           MR. MOYER: Yes, that's why I said,  
18 even though a grade school kid can tell you what  
19 soil is. Soil is soil. It is not coir mixed  
20 with a little compost or a nutrient soup. That's  
21 hydroponic anyway you define it. That's correct.  
22 Thank you.

1                   CHAIRMAN CHAPMAN: Thank you. Up next  
2 is Roger Noonan following by Michael Brownback.  
3 Roger, if you could start with your name and  
4 affiliation for the record.

5                   MR. NOONAN: Thank you Mr. Chairman.  
6 Roger Noonan, Middle Branch Farm, New Boston, New  
7 Hampshire, Permit No. 186 by the New Hampshire  
8 Department of Agriculture Markets and Food, which  
9 does not certify hydroponic operations.

10                   I'm also the President of the New  
11 England Farmers Union. I'm a Supervisor on my  
12 local soil and water conservation district's  
13 board, and I'm speaking today as an organic  
14 farmer.

15                   I'm involved in a lot of different  
16 things in policy and I'll tell you, this issue is  
17 probably the most confounding, the NOSB and the  
18 NOP is probably the most confounding. I was  
19 probably much happier person when I was just  
20 paying attention to my own business on the farm.

21                   I want to thank you all for your  
22 service on this Board. I'd been asked to serve

1 on the NOSB a few years ago and declined that  
2 pleasure. And I don't envy the decisions you  
3 have to make. So thank you all for your service.

4 First I want to address another issue.  
5 I would urge the NOSB to take the native eco  
6 system proposal back. I'm from New Hampshire, a  
7 state that was, now 89 percent forested but not  
8 long ago was nearly completely deforested for  
9 various agricultural reasons.

10 I'm in a area that's suburbanized now.  
11 I don't have many options. Buying new farmland  
12 is not an option. We may have to clear some  
13 land. I have two adult children involved in the  
14 farming business, so I'd urge you to really take  
15 a hard look at what native eco system means and  
16 what that means to the viability and  
17 sustainability of farms that are on that peri-  
18 urban fringe.

19 Additionally, on the hydroponic issue,  
20 I mean for me it starts with the soil. I'm not a  
21 lawyer. I know more than I should and I just  
22 can't read the Organic Foods Production Act,

1       which I read twice after Miles sent out his  
2       farewell email, and I just don't find the space  
3       in there. And I understand the quandary. Once  
4       you allow something, and it has sort of tacit  
5       approval in this case, I'm not really sure how  
6       it's existing now, but it's just not in the law.  
7       It's not in any of the preamble as others have  
8       said. Two-thirds of my ground can be undercover  
9       crop at any given time. And then it's undercover  
10      crop, well as soon as we finish the Brussels  
11      sprouts it will all be undercover crop here when  
12      I get home.

13                   How am I even competing on even  
14      footing with a hydro unit, and this isn't about  
15      size. It's about a set of rules that we all  
16      agreed, voluntarily agreed to abide by. And the  
17      small farmers, many of them that showed up for  
18      this meeting, we don't have an army of attorneys  
19      that we can send here and draft very impressive  
20      comments for your consideration.

21                   So I would just urge you to do the  
22      right thing for the organic label which is the

1 original sustainability label. Thank you very  
2 much.

3 CHAIRMAN CHAPMAN: Thank you.  
4 Questions? Thank you. Up next we have Michael  
5 Brownback followed by Jen Berkebile. Michael, if  
6 you could start with your name and affiliation.

7 MR. BROWNBACK: Good afternoon. I'm  
8 Mike Brownback. Along with my wife and family we  
9 farm Spiral Path Farm in Pennsylvania. We are  
10 currently certified by Pennsylvania Certified  
11 Organic and have been since its beginning in  
12 1997.

13 I guess everybody's getting a little  
14 winded hearing the same thing, but one thing that  
15 I want to talk about. I was around, this is my  
16 second time commenting to the NOSB and the first  
17 time was at the proposed rule back when it was  
18 the Big Three, you know, the sludge, the  
19 irradiation and the GMO's. And we've come a long  
20 way from then and congratulations everybody.

21 But I'll tell you one thing. Back  
22 then, one of the rationalizations was that we

1 were going to have reciprocity internationally.  
2 And that IFOAM accreditation was going to be  
3 something that we'd all have. And I don't  
4 understand why the United States is a dumping  
5 ground of the world for hydroponics? What's  
6 going on here? This is something that's very  
7 confusing to me.

8 As far as following plans for soil  
9 improvement, we've taken a farm that was run down  
10 that we purchased in 1977 with 1.7 percent  
11 organic matter. It's now well over 5 percent.  
12 You know, raising organic matter, that is carbon  
13 sequestration. I only have a ninth grade  
14 education as far as my biology goes, but  
15 basically the simple sugars that come from  
16 photosynthesis, they go into the soil, the  
17 excess.

18 How can they go into the soil if it's  
19 protected by a layer of a container of a raised  
20 bed or whatever term we want to use? I don't get  
21 it. I'm somewhat confused. Where is our  
22 integrity? What do we have for anatomy as a

1 people if we are willing to turn a blind eye to  
2 the facts of life?

3 We've had many people here eloquently  
4 state what is true and what is simple a child can  
5 understand. What do we need to do? I don't see  
6 anybody in this room that is opposed to  
7 hydroponics that is going away. Are any of you  
8 guys going away? I don't think so. We're here  
9 for the long haul. I do not question the  
10 integrity of the NOSB. I question the  
11 interaction between the NOSB, the NOP and the  
12 USDA. And I have to say also that the USDA has  
13 done wonderful things for me as a farmer with  
14 conservation help and areas like that, that I  
15 think is very laudable, that has been done over  
16 the years, and I think we need to continue that  
17 and maintain the integrity of what we do. Thank  
18 you.

19 MR. CHAPMAN: Thank you, Michael.

20 Dave, Emily, and we'll have to stop it  
21 there.

22 MR. MORTENSEN: Mike, could you give

1 us a sense for the scale, the number of people  
2 you're feeding off of Spiral Path Farm, just for  
3 the record?

4 MR. BROWNBACK: Yes. Spiral Path Farm  
5 currently is about 250 acres. We have about 80  
6 acres in certified organic produce that we grow.  
7 We feed at least 3,000 or 4,000 people in our  
8 CSA. We have in the vicinity of 2,000 members.  
9 But we also sell to a major retailer.

10 We would easily provide produce for  
11 20,000 people. Easily.

12 MR. MORTENSEN: Thank you.

13 Emily.

14 MS. OAKLEY: So this question: would  
15 you support for crops the pending motion on  
16 containers or would you prefer to see soil,  
17 growing in the ground only?

18 MR. BROWNBACK: I'm going to look you  
19 all in the eye and say you all know what's right.  
20 I believe there is time for compromise. But  
21 there's time that I have to be true to Mother  
22 Earth. And a terrestrial plant that's evolved

1 over eons of time with its roots in the soil, I'm  
2 going to vote for modifying that? I can't. I  
3 cannot support that. I am for the soil.

4 MR. CHAPMAN: Thank you. Thank you  
5 for your testimony.

6 Up next is Jen Berkebile followed by  
7 Alan Lewis. Jen, if you can start with your name  
8 and affiliation, and correct your last name if I  
9 tortured it. Sorry.

10 MS. BERKEBILE: Good afternoon. My  
11 name is Jennifer Berkebile. I am Materials  
12 Program Manager at Pennsylvania Certified  
13 Organic. PCO certifies over 1,300 operations.

14 I wanted to begin my comments by  
15 thanking the members of the Board for all of  
16 their time and effort. Today I will be  
17 commenting on petitions and sunset materials, as  
18 well as the livestock proposal clarifying  
19 emergency for use of synthetic parasiticides in  
20 organic livestock production.

21 I would like to first comment on  
22 oxytocin which is up for sunset and which the

1 Livestock Subcommittee has voted to remove from  
2 the National List. PCO is not taking a position  
3 on whether oxytocin should remain on the National  
4 List. However, I did want to comment that we  
5 have approximately 100 operations that list an  
6 oxytocin production on their materials used form,  
7 and some have expressed concern to me about the  
8 possibility of this material being removed from  
9 the National List .

10 I can't speak for all of these  
11 producers, but it's my general understanding that  
12 the majority do not use it often or maybe even  
13 once a year but, rather, they just like to have  
14 it available for very rare situations such as  
15 collapsed uterus or other medical emergencies.

16 I would like to briefly comment on the  
17 petition for elemental sulfur for use as an  
18 external parasiticide pesticide for organic  
19 livestock. Again, PCO is not taking a position  
20 on whether elemental sulfur should be added to  
21 the National List. However, PCO has received  
22 requests from over 100 producers to review and

1 allow elemental sulfur for this use.

2           Finally, I wanted to reiterate our  
3 written comments on the proposal clarifying  
4 emergency use of synthetic parasiticides in  
5 organic livestock production. PCO appreciates  
6 the work of the subcommittee to flesh out the  
7 acceptable use of synthetic parasiticides in  
8 organic livestock production, however, the  
9 structure and language in this proposal lack  
10 clarity. It is unclear whether paragraphs 1  
11 through 4 are optional or mandatory. If they are  
12 mandatory it is unclear whether all are mandatory  
13 prior to the use of a synthetic parasiticide or  
14 whether one is sufficient.

15           I will refer the subcommittee to my  
16 written comments to view some suggested edits to  
17 the proposed language.

18           Thank you for your time and for the  
19 opportunity to comment.

20           MR. CHAPMAN: Harriet then Emily.

21           MS. BEHAR: With regard to the  
22 oxytocin, do you think that your producers could

1 have an opportunity to learn some of the natural  
2 materials because there's many -- there are  
3 alternatives out there? And the larger milk  
4 buyers have said that they do not support  
5 relisting.

6 So I understand wanting to have a  
7 material on the National List, but part of our  
8 criteria is that if there is a natural  
9 alternative and we should be looking at not  
10 approving a synthetic.

11 MS. BERKEBILE: Right. And we do,  
12 again, have about 100 producers with it on their  
13 materials use form. But I would say maybe we  
14 have 500 organic operations in total that have  
15 cows. So, you know, only on 100 out of 500. So  
16 presumably some of our producers have found some  
17 other working alternative.

18 So I do assume that maybe the ones  
19 that are using it could find alternatives if they  
20 are out there.

21 MR. CHAPMAN: Emily.

22 MS. OAKLEY: I wanted to ask you about

1 Vitamin B1. You said that you weren't taking a  
2 position on any of those materials but listed  
3 that there were six products that contained a  
4 blend of C, E, and B1.

5 MS. BERKEBILE: Uh-huh.

6 MS. OAKLEY: So I know that's your  
7 position, but I just wanted to ask, given the  
8 fact that the technical review was very clear  
9 that B1 is not effective for that use would you  
10 see it as a limitation if we did remove it from  
11 the list?

12 MS. BERKEBILE: I don't know that I  
13 would see it as a limitation. But, again, I'm  
14 not an expert in the efficacy of that at all.  
15 And that's only a handful of products. So I  
16 really think if it was removed it might not have  
17 a great impact.

18 MR. CHAPMAN: A-dae.

19 MS. BRIONES: So you mentioned that  
20 you have producers who are encouraging the  
21 listing of elemental sulfur. Can you just give  
22 me a sense of how many producers you represent?

1 MS. BERKEBILE: Yes. I think about  
2 100 producers I would say would like to have that  
3 listed for that use.

4 MR. CHAPMAN: Thank you.

5 Thank you. Up next is Alan Lewis  
6 followed by Howard Prussack. Alan, you can start  
7 with your name and affiliation.

8 MR. LEWIS: Alan Lewis from Natural  
9 Grocers.

10 Hello, NOSB. This is my eighth  
11 comment on hydroponics. I'm sure, Francis, you  
12 won't miss the ninth.

13 Natural Grocers, 42 -- 62 years old,  
14 family run, 142 stores in 19 states. We are one  
15 of the pioneer companies that set our own  
16 standards in the '50s, '60s, and '70s. Did our  
17 own inspections when we had to, and were very  
18 happy when the certifiers at the state level came  
19 onto the scene.

20 We are very much focused on education.  
21 In fact, we consider ourselves an education  
22 company. We have educated four generations of

1 our customers. We are also known for being  
2 organic plus because in very many instances the  
3 organic standard is not enough for our customers.  
4 That includes free range, open range eggs,  
5 pastured eggs. It means pasture-based dairy. It  
6 means grass-fed beef, lamb, and bison.

7 We educate our customers on those  
8 issues and we create a market for those standards  
9 and work with the vendors to meet those standards  
10 based on just shorthand, regeneration, added  
11 nutrition, economic opportunity, rural  
12 development, climate change, reduction of  
13 pesticides, renewable certifiers, and a synthetic  
14 load of chemicals in our bodies and environment.

15 So our customers come to expect  
16 transparency in everything that we do. And they  
17 come to expect continual improvement. So imagine  
18 our surprise in the last month and few years that  
19 a group of certifiers and certified organic  
20 operations are putting hydroponic produce  
21 unlabeled and unannounced into the marketplace.

22 And imagine our customers' surprise

1 when we have to put up labels saying "organic,  
2 just kidding, also hydroponic" because all of  
3 those things that we teach as values and as  
4 science and as critical attributes of good  
5 agriculture and healthy nutrition are suddenly  
6 suspect.

7           Secondly, imagine our surprise when we  
8 try to go out and find berries and cucumbers and  
9 peppers and they're no longer available because  
10 the hydroponic industry has largely captured that  
11 market, taken the price premium, but left the  
12 dirt-in-the-ground organic growers high and dry.

13           So please consider the millions of  
14 customers, the vanguard of organic demand that we  
15 and retailers like Mom's Market and PCC and  
16 others have developed over the last several  
17 decades. If we don't move on this issue and put  
18 hydroponic where it is, then Natural Grocers will  
19 again continue down the road of organic plus.

20           Thank you.

21           MR. CHAPMAN: Thank you, Alan.

22           Dan.

1 DR. SEITZ: Could you elaborate a  
2 little bit more on the point you just made about  
3 the difficulty of finding peppers and tomatoes,  
4 or whatever the produce you've mentioned, grown  
5 by soil-based farms; are you saying that the  
6 hydroponic operations to some degree are driving  
7 out certain types of produce because of a price  
8 differential? Or can you just unpack that a  
9 little bit and explain the nature of the  
10 economics at work there?

11 MR. LEWIS: Thank you, Dan.

12 First of all, it has to be particular  
13 to regions and seasons. But what hydroponic  
14 operations, as other people have mentioned, what  
15 they offer is continual harvest 12 months out of  
16 the year at a lower cost. And so the seasonal  
17 harvesters, say in Colorado or other places, --  
18 I'm most familiar with Colorado at this point --  
19 you get in a train wreck with the distributors  
20 and the supply chain. Because if someone has a  
21 contract for delivering identical, blemish-free  
22 hydroponic vegetables week after week after week,

1 then the guy with dirt on his boots, developing  
2 the soil, making his family's -- making ends meet  
3 for his family might knock on our door and say,  
4 "I've got cukes, I've got berries, I've got some  
5 peppers for you," but there's no -- that becomes  
6 a disruption and a problem.

7 And his prices, or her prices, are  
8 typically higher than the hydroponic prices.

9 Does that help you figure this out?

10 DR. SEITZ: Yes. Thank you.

11 MR. CHAPMAN: Thank you.

12 Sue.

13 MS. BAIRD: Yes. Thank you for  
14 developing the market, Alan. I wanted to follow  
15 up with that because, you're right, seasonally,  
16 at least in Missouri it's pretty hard to grow  
17 tomatoes and peppers in the wintertime.

18 So, that being said, I hate this me or  
19 thee thing. Would you be -- would you endorse a  
20 label that would say hydroponic organics, or  
21 whatever we would call it, so that there is clear  
22 transparency?

1                   MR. LEWIS: Yeah. I think that is the  
2 proper direction. As I said, if you have a  
3 clean, as regenerative as possible, nutritious  
4 hydroponic operation, preferably closer to an  
5 urban center, then that should be USDA process  
6 verified operation. And then we can backtrack  
7 and reestablish our education for our customers  
8 to maintain that transparency and that continual  
9 improvement.

10                   Because where you're headed is  
11 otherwise I get organic, dirt-grown tomatoes  
12 from, who knows, New Zealand, you know, all  
13 winter long. And that's another problem.

14                   MS. BAIRD: Thank you.

15                   MR. LEWIS: You're welcome.

16                   MR. CHAPMAN: Albert -- sorry, Ashley  
17 and then Steve.

18                   MS. SWAFFAR: So a little bit more on  
19 that label compromise. I think what we're saying  
20 here is it wouldn't be USDA process verified, it  
21 would be that -- some of us would say that -- it  
22 would be this logo and say hydroponically grown

1 or something like that. Would you support that?

2 MR. LEWIS: No.

3 MR. CHAPMAN: Steve.

4 MR. ELA: So I'm a grower and not a --  
5 well, I guess I am a marketer in some ways, but  
6 you see many more people. And we've heard  
7 testimony and received comments that consumers  
8 are looking for more organic produce, you know,  
9 this is a market increase.

10 But what I heard you say, and correct  
11 me if I'm wrong, please, is that your consumers  
12 and your stores want soil-grown, but there is a  
13 difference. And so could you elucidate a little  
14 more on consumer preference because that's  
15 something that's come up a number of times and I  
16 think it's a little cloudy as to how that falls?

17 MR. LEWIS: So part of the background  
18 that I left out is we only sell organic produce.  
19 So, you know, just focusing again on Colorado,  
20 which you're familiar with, 3- or 4-month  
21 harvest. For you with stone fruit, a 3-week  
22 harvest. I don't know what you do the rest of

1 the year.

2 PARTICIPANT: Take vacation.

3 (Laughter.)

4 MR. LEWIS: Florida.

5 So these value, these subjective value  
6 issues about family farms, biodiversity,  
7 environment, fossil fuels, carbon sequestration,  
8 animal and human welfare, all of those roll up  
9 and largely get resolved on the biodiverse  
10 organic family farms that are represented by many  
11 of the farmers on the NOSB now and in the room.

12 That's what our core customer is.  
13 Now, that's a million people out of 350-some  
14 million consumers, but it's also a lot of  
15 households. And that's concentrated in these  
16 areas where we have our stores. So it is a  
17 holistic view of health in life a new generation,  
18 and that generation, that generational view seven  
19 generations down, as Ms. Stokie might say.

20 So that it is a safe, blemish-free 52-  
21 week-a-year production system is largely  
22 irrelevant to the core values and the core

1 science that our customers understand.

2 MR. CHAPMAN: Thank you, Alan.

3 MR. LEWIS: Thank you.

4 MR. CHAPMAN: We're going to move on  
5 at this time. Up next is Howard, followed by  
6 Paul Harlow.

7 Howard, if you can start with your  
8 name and affiliation for the record.

9 MR. PRUSSACK: Yes. My name is Howard  
10 Prussack. I represent my own farm, High Meadows  
11 Farm in Westminster, Vermont. And thank you to  
12 the Board for allowing me to speak. It's hard  
13 work doing what you're doing. I respect it.

14 I started farming in 1971 as an  
15 organic farmer. I don't know if there's very  
16 many more people in this room who might have a  
17 older legacy than I have. And what that means  
18 is, yeah, I've been doing it for a long time and  
19 it's given me a perspective. I've watched this  
20 industry grow. It wasn't an industry when I  
21 started. Nobody organic. We had like one or two  
22 books that even gave us any guidance, and we

1 really had to struggle and fight and define the  
2 information that we needed to perfect it and go  
3 forward. And sometimes we failed.

4 And it was tough going for many years.  
5 It was a small niche. Now it seems it's an  
6 international industry that's huge, and it's the  
7 fastest growing component in the agricultural and  
8 food grocery stores. And all of a sudden  
9 everybody wants to be organic.

10 I've earned a certain credibility from  
11 my time doing this -- 40-plus years -- the trust  
12 and respect of people in my farming community  
13 and, most importantly, my customers who have come  
14 to depend and count on what I do and my other  
15 compatriots in the industry who are small organic  
16 farmers.

17 I'm not going to violate that trust  
18 and that respect that they've given me. When  
19 they buy food from me, when people buy organic  
20 food they expect it, they assume it's grown in  
21 soil. That's what they think. You know, no  
22 sleight of hand should be done that would erode

1 that trust.

2 I'm not against hydroponics. They  
3 really need their own label. I don't want to see  
4 a compromise saying organic hydroponic as that's  
5 going to muddy the water and confuse customers.  
6 We've built a brand, as somebody's mentioned  
7 earlier, and I don't want to violate that trust.  
8 All the hard-working men and women and families  
9 that put their lives and their blood into this  
10 industry should not be disregarded.

11 The people, our customers, respect  
12 that. They know that. We've created a legacy.  
13 And as we move forward into the future that's  
14 really all I'm working for is to leave a legacy  
15 that people could live by of organic farming is  
16 people growing crops in the soil that's going to  
17 leave the Earth better than when we got here.  
18 And that's, that's the charge that we're faced  
19 with, leaving the Earth in a better place, not a  
20 worse place.

21 Thank you.

22 MR. CHAPMAN: Ashley, Sue, then Emily.

1 MS. SWAFFAR: So you do tomatoes in a  
2 greenhouse; is that correct?

3 MR. PRUSSACK: I do tomatoes in a  
4 greenhouse in soil.

5 MS. SWAFFAR: Can you tell me your  
6 crop rotation? How do you -- what do you do  
7 there?

8 MR. PRUSSACK: It's Vermont so I don't  
9 grow year-round. We're a seasonal farm. It's we  
10 grow the tomatoes when they're planted in the  
11 ground in April. We just finished harvesting  
12 last week. It's an unusually long harvest season  
13 for us that's great. We clean up the greenhouse.  
14 We apply compost early, early spring and till it  
15 in and plant tomatoes.

16 So that's it. There's no other crop  
17 that's grown in those tomato greenhouses, it's  
18 just tomatoes. It's one greenhouse.

19 I have other greenhouses that we grow  
20 in the soil raspberries and a few other minor  
21 crops. But mostly we're an outdoor production  
22 soil farm.

1 MR. CHAPMAN: Sue.

2 MS. BAIRD: Yes. I really am amazed  
3 at the volume of production that you're doing.  
4 Can you tell me what your soil fertility inputs  
5 are that you use? I know that you mentioned  
6 compost but you've got -- what are you using?

7 MR. PRUSSACK: We do, it's a -- Well,  
8 in the field or in the greenhouse? What are you  
9 referring to?

10 MS. BAIRD: Both.

11 MR. PRUSSACK: Well, in the field we  
12 do extensive green manure crops. Some of the  
13 green manure we leave for a year or two years.  
14 And sweet clover, peas and oats. We do apply  
15 compost and pelletized chicken manure that we get  
16 from New York State.

17 MS. BAIRD: And in the greenhouse?

18 MR. PRUSSACK: Well, the greenhouse,  
19 as I said, we just, the tomato house is only a  
20 tomato house. That's all we grow. And we just  
21 apply compost.

22 MS. BAIRD: Do you see a difference in

1 chicken manure that is composted just on the  
2 ground, or maybe not, raw? A lot of people use  
3 just raw chicken manure? Do you see, would you  
4 see a difference -- and you don't I'm sure on  
5 your vegetables -- but in grain crops they do.  
6 Would you see a difference in that versus putting  
7 it in a solution and liquefying it and spraying?  
8 Because I see that as well in organic field  
9 crops.

10 MR. PRUSSACK: I don't use liquefied  
11 manure. I'm not sure of the question. Would I  
12 see a difference? I suppose I would.

13 I've been using the same system for  
14 many years. It grows a really tasty tomato. I  
15 don't think I'm going to change. Tomatoes are  
16 just one of the crops we do. But it's a key  
17 crop. People, people love it. We've got a good  
18 reputation for what we grow.

19 MS. BAIRD: Thank you.

20 MR. CHAPMAN: Thank you.

21 Emily.

22 MS. OAKLEY: Same question, do you

1 support the CS compromise motion on containers or  
2 would you prefer to see it in the soil in the  
3 ground?

4 MR. PRUSSACK: I didn't quite hear  
5 that. I'm sorry.

6 MS. OAKLEY: Sorry. Would you prefer  
7 to see it in the soil in the ground or would you  
8 support the CS compromise motion on containers?

9 MR. PRUSSACK: I'm a ground-based, I'm  
10 a soil-based farmer. Container growing is  
11 container growing. It's, you know, apples and  
12 oranges. It's a different, totally different  
13 thing.

14 When people buy a tomato they expect  
15 it to be grown in soil. If it's not it should,  
16 it should say that. You know, they can have  
17 their own.

18 We have our story, a hard, you know,  
19 won, fought story. It's a great story, you know,  
20 the story of small organic farmers all across  
21 this country. They should develop their own  
22 story.

1 MR. CHAPMAN: Thank you.

2 MR. PRUSSACK: You know, whatever it  
3 is.

4 MR. CHAPMAN: Thank you.

5 MR. PRUSSACK: All right. Thank you.

6 MR. CHAPMAN: Up next is Paul Harlow  
7 followed by Michael Collins.

8 Just so you guys know, it's just after  
9 6:00 o'clock now. We have ten more commenters.  
10 So we are looking to track till about 7:00  
11 o'clock at night. I know the agenda said it was  
12 6:15, but given the questions we've had we will  
13 go until we have completed the list.

14 Paul, you can start with your name and  
15 affiliation.

16 MR. HARLOW: Right. I'm Paul Harlow.  
17 I'm a 300-acre certified organic farmer in  
18 Westminster, Vermont. I'd like to speak against  
19 hydroponics as a certified organic.

20 I'd like to make my comments as in the  
21 avenue of the history of my farm. My grandfather  
22 started the farm in 1917, so that's 100 years

1 ago. He was a -- milked a few cows, grew some  
2 vegetables. He was basically an organic farmer.

3 My father took over in 1950; followed  
4 the same regimen. Although, as farmers did after  
5 World War II, we started using some chemicals,  
6 mostly herbicides I believe. He sold his cows in  
7 1965. And he and I grew vegetables for about 10  
8 years together to pay the taxes and keep the farm  
9 alive somewhat.

10 And at that time I was doing things  
11 that I had learned through the Extension Service:  
12 applied 10-10-10, spray atrazine, and certain  
13 chemicals that, you know, reduced the weed  
14 pressure.

15 I took over in 1974. And I started to  
16 see things that were troubling to me. The wind  
17 blew the dirt more than I remembered. I couldn't  
18 find worms that I had as a kid when my father  
19 would plow. I started seeing weeds that we  
20 couldn't control. Nutgrass, it seemed like no  
21 matter how much atrazine or whatever chemical we  
22 applied that nutgrass seemed to thrive.

1                   So, surprisingly to me, at sort of a  
2                   young age I realized that I was the caretaker of  
3                   this land for future generations and that it was  
4                   very important that if this land was going to  
5                   survive I had to change what I was going to do.  
6                   It was important to me that this land needed some  
7                   more attention, and I was not doing the right  
8                   thing.

9                   That's when I started looking into  
10                  organic. Actually Howard, the previous witness,  
11                  was in my town and I got some information from  
12                  him. I did a lot of reading, a lot of trial by  
13                  error. It took me 10 years to become certified.

14                  I remember picking sweet corn out  
15                  there when there were so many weeds I questioned  
16                  what I was doing. But I persevered. And now I  
17                  have about 300 acres from that 30 or 40 acres.  
18                  And we use a lot of cover crops. My farm is a  
19                  very thriving farm. I believe that I did the  
20                  right thing. Our land is just, it's productive,  
21                  it's doing the right thing.

22                  And I guess I'd like to end by

1 thinking of a comment that a UVM agronomist of  
2 years ago, he would say, I would argue that what  
3 I was doing for those 10 or 15 years is similar  
4 to what hydroponic growers are growing, that I  
5 was just throwing stuff into the soil that was  
6 not doing anything for that long-term life of  
7 that soil, and that I was not promoting the long-  
8 term fertility and life that I needed to do to  
9 make sure that my soil was good for the rest of  
10 eons I guess.

11 Thank you.

12 MR. CHAPMAN: Questions? Ashley.

13 MS. SWAFFAR: Do you grow tomatoes in  
14 a greenhouse?

15 MR. HARLOW: I do not.

16 MS. SWAFFAR: You don't?

17 MR. HARLOW: I'm just an outside  
18 grower, yes.

19 MS. SWAFFAR: Organic integrity.

20 MR. CHAPMAN: Emily.

21 MS. OAKLEY: Okay. Sorry for  
22 continuing to ask the same question.

1 MR. HARLOW: Sure.

2 MS. OAKLEY: But would you support  
3 the CS motion on containers with the compromise  
4 that we came up with or would you prefer in the  
5 soil in the ground.

6 MR. HARLOW: Totally soil in the  
7 ground.

8 MR. CHAPMAN: Thank you.

9 We'll have to move on now. Up next is  
10 Michael Collins followed by Jim Riddle on deck.

11 And, Michael, if you can start with  
12 your name and affiliation.

13 MR. COLLINS: I'm Michael Collins from  
14 the Old Athens Farm in Westminster, Vermont.

15 I've been farming organically since  
16 1989. I sell locally in Southern Vermont and am  
17 known primarily for my tomatoes. I'm asked  
18 weekly at farmers' market if my tomatoes are  
19 organic. They are.

20 Too often the next question is, Are  
21 they hydroponic? For close to 30 years I've  
22 answered that no, that would be an oxymoron.

1           When I started farming the organic  
2 standards were set locally. Every year a group  
3 of farmers would get together and vote on the  
4 standards. These people's motivations ranged  
5 widely, and the standards we passed reflected our  
6 disparate priorities, whether they concerned  
7 which chemicals we would be permitted to use, the  
8 health of our soil, our environmental footprint,  
9 or the treatment of our animals.

10           We also worked hard to educate our  
11 customers and improve the value of the organic  
12 brand, which we did successfully. As the share  
13 of organic food in the marketplace increased, so  
14 did the corporate and governmental interest.  
15 Control of the organic label was given to the  
16 federal government on the pretext that a uniform  
17 standard would benefit consumers and farmers by  
18 using interstate and international trade, and  
19 ensuring that all states maintain the same high  
20 standards.

21           Many of us feared at that time the  
22 opposite outcome. In New England the vast

1 majority of organic farmers believe that soil is  
2 an integral part of the organic agriculture.  
3 Mislabeled hydroponic produce as organic is at  
4 best confusing our customers. It would be a  
5 watering down of the label we worked so hard to  
6 create.

7 Thank you.

8 If you don't want to ask any questions  
9 I'll get out of here faster anyway.

10 (Laughter.)

11 MR. CHAPMAN: Ashley.

12 MS. SWAFFAR: Do you grow tomatoes in  
13 a greenhouse?

14 MR. COLLINS: Yes, I do.

15 MS. SWAFFAR: Can you tell me your  
16 crop rotation?

17 MR. COLLINS: You're kind of fixated  
18 on a crop rotation, which I'm thinking is  
19 demonstrating a little lack of understanding of  
20 process of growing tomatoes in a greenhouse.  
21 There is no crop rotation in that case. And, and  
22 we fertilize and give the crops what they need.

1 Everything is cleaned out at the end of the year  
2 so that pests can go away.

3 We bring compost in, more compost than  
4 most people can imagine. We're fertilizing  
5 primarily with alfalfa meal and wheat bran. I  
6 don't know why I use wheat bran. Just some old  
7 Japanese guy told me it was good.

8 MR. CHAPMAN: Dave and Emily, and  
9 we'll stop there.

10 MR. MORTENSEN: Yes, I just was  
11 curious. Could you, could you just tell us a  
12 little bit more about the fertility program, and  
13 then once you plant the tomatoes in the house are  
14 you, are you dripping a nutrient solution into  
15 the house?

16 MR. COLLINS: No. The way it's  
17 working is our plants are in the soil. And the  
18 soil is covered with actually nutrient film  
19 plastic. It's kind of ironic just because it's  
20 heavy duty but which keeps the moisture in the  
21 soil beds. And if the roots are strong enough  
22 and the plants are healthy enough those roots

1 will grow right up onto the surface of the soil.

2 And we can fertilize with, you know,  
3 hard fertilizer, alfalfa being one of my  
4 favorite. We can use blood meal if we're getting  
5 low on, we'll use something a little bit quicker.  
6 And we also need to add potash in the form of  
7 sulfated potash.

8 MR. MORTENSEN: Thanks.

9 MR. COLLINS: But that's all, that's  
10 all not liquidly added.

11 MR. BRADMAN: Tom, can I ask one more  
12 question?

13 MR. CHAPMAN: We had Emily and then  
14 you.

15 MR. BRADMAN: Oh, okay. But you're  
16 not closing it down?

17 MR. CHAPMAN: I am. Emily.

18 MS. OAKLEY: I just want to ask the  
19 same question about container compromise which I  
20 will just also preface we would anticipate to  
21 include some composts and/or soil in it versus in  
22 the ground only with no containers. What's your

1 preference?

2 MR. COLLINS: Well, my preference is  
3 in the soil. And it's just a simpler option.

4 I mean, if you're asking what my  
5 preference is it's just straightforward. And  
6 it's also much easier to grow something in soil  
7 because the soil is doing its job. I mean it's  
8 difficult enough as it is being ahead of the  
9 nutrient curve in a way. But I really can't  
10 imagine doing it in a container.

11 MR. CHAPMAN: Thank you, Michael.

12 Asa.

13 MR. BRADMAN: I probably should have  
14 been asking this of more people, but in terms of  
15 outside inputs like compost, and you mentioned  
16 alfalfa, I'm curious what different products do  
17 you truck or bring into the farm? And do you  
18 have an idea of what percentage of fertility?  
19 Kind of maybe off site we can talk more about  
20 that but.

21 MR. COLLINS: It would be really hard  
22 for me to tell you the percentage of off site

1       fertility exactly. But I'm buying mostly alfalfa  
2       meal; that's off site. And if we use blood meal,  
3       that's definitely off site.

4                 We were talking about that earlier,  
5       that's generally not coming from organic  
6       production. The, especially the blood meal. You  
7       know, back in the old days we used to use fish  
8       meal but after mad cow the price of that went out  
9       the, out the roof.

10                MR. BRADMAN: Right. Right.

11                But you are trucking in, it sounds  
12       like, a number of inputs from off the farm onto  
13       the land?

14                MR. COLLINS: Yes. We need to truck  
15       inputs from off the farm.

16                MR. BRADMAN: And your production is  
17       dependent on that?

18                MR. COLLINS: That's an interesting  
19       question. I mean I -- the question, could I get  
20       around it with the greenhouse tomatoes? Probably  
21       not.

22                With my outdoor production and with my

1 greenhouse greens? Yes, I could, just because of  
2 the different timing of the nutrient needs.

3 MR. BRADMAN: Right. Thanks.

4 MR. CHAPMAN: Thank you.

5 Up next we have Jim Riddle followed by  
6 Charlotte Vallaeys.

7 Jim, if you can start with your name  
8 and affiliation for the record.

9 MR. RIDDLE: Jim Riddle, Blue Fruit  
10 Farm, Winona, Minnesota. I also chair the  
11 Minnesota Department of Ag's Organic Advisory  
12 Board, as well as the Steering Committee of the  
13 Organic Farmers' Association, which is unique in  
14 that only certified organic farmers vote on our  
15 policies and leadership.

16 And we do have some policy positions  
17 from OFA that are being passed out. And the OFA  
18 members did vote in support of the Crop  
19 Subcommittee's recommendation on hydroponic.

20 I'd like to offer comments on my own.  
21 And beginning by saying that the labeling of  
22 hydroponic products as organic is illegal. OFPA

1 6513(b)(1) states "an organic plan shall contain  
2 provisions to foster soil fertility." It "shall"  
3 not just it "should."

4 And it goes on to say, 6513(g), "an  
5 organic plan shall not include any production or  
6 handling practices that are inconsistent with  
7 this chapter." Soil-less production systems are  
8 inconsistent with OFPA. And they do not comply  
9 with numerous provisions of the regulation which  
10 have been enumerated by the Crops Subcommittee in  
11 your recommendation.

12 But you missed one. And that is in  
13 205.601(j)(6) the listing of micronutrients has a  
14 very important annotation. And that says that  
15 "soil deficiency must be documented by testing."  
16 Now, that doesn't mean the deficiency of soil.  
17 That links soil to the use of micronutrients that  
18 it must be documented by testing deficiency of  
19 those micronutrients.

20 It also doesn't comply with the NOSB's  
21 own principles of organic production and  
22 handling. The first sentence reads, "Organic

1 agriculture is an ecological production  
2 management system and promotes and enhances  
3 biodiversity, biological cycles, and soil  
4 biological activity."

5 I served on the NOSB from 2001 to  
6 2006. During that time we adopted  
7 recommendations on organic greenhouse operations.  
8 And it was proposed that we address hydroponics.  
9 And I and other members of the Board at that time  
10 felt that it was so far outside the scope of the  
11 law that we didn't address it. We had other  
12 priorities, as you have lots of other things on  
13 your table as well.

14 I'm sorry that we didn't. I'm sorry  
15 that we did not nip it in the bud. And there are  
16 companies that have made bad business decisions,  
17 and consumers are being deceived, and bona fide  
18 organic farmers are facing unfair competition  
19 from this sector. So I urge you to prohibit  
20 hydroponic products in your recommendation since  
21 it's already prohibited in the law. And this  
22 discussion of having a label attached to the word

1 "organic," you can't even consider that. There  
2 couldn't be transitional organic --

3 MR. CHAPMAN: Thank you, Jim.

4 MR. RIDDLE: -- even though transition  
5 is part of the process, but there couldn't be a  
6 label for that.

7 MR. CHAPMAN: Thank you, Jim.

8 MR. RIDDLE: Thank you.

9 MR. CHAPMAN: Questions?

10 MR. CHAPMAN: Jim, I have a question.  
11 So your term of service was from 2001 to 2005;  
12 did I get that right?

13 MR. RIDDLE: Six.

14 MR. CHAPMAN: Six.

15 MR. RIDDLE: Six.

16 MR. CHAPMAN: 2002 to 2006?

17 MR. RIDDLE: No. Five years.

18 MR. CHAPMAN: 2001 to 2006. My math  
19 is not so great today.

20 Did you read the proposal in its  
21 entirety? There's a history section at the very  
22 beginning.

1 MR. RIDDLE: Right.

2 MR. CHAPMAN: And you, you just stated  
3 that you did not resolve it at the time because  
4 you thought it was so far outside the standards  
5 it couldn't possibly be considered organic, and  
6 yet at the same time repeatedly during that time  
7 frame the organic program was telling the NOSB,  
8 as documented in the transcripts, that they  
9 considered hydroponics under organics.

10 So if it was so clear at that time,  
11 why did NOSB not take the action that you're  
12 advising us to take at this time?

13 MR. RIDDLE: Yeah. Well, if you  
14 recall, and maybe you weren't there, but the  
15 program at that time also issued four directives  
16 that had to be retracted because they were done  
17 without consultation of the Board. That was  
18 another one, it wasn't retracted, but it was done  
19 with no consultation of the NOSB. So we didn't  
20 have a say in that. Yes, the program took that  
21 position but the Board was not consulted.

22 MR. CHAPMAN: I hear that. But can

1 you point to meetings that occurred where you  
2 guys directly objected to it or raised concerns?

3 MR. RIDDLE: No, I cannot point to.  
4 There were, transcripts were started during about  
5 the middle of my term. There was a very foggy  
6 record for some of those early ones. But I do  
7 recall that the Crops Committee in addressing  
8 greenhouses, and one of our members Owusu  
9 Bandele, brought forward shouldn't we include  
10 hydroponic in this. And we said no. Focus on  
11 what's really happening organically, which is  
12 greenhouse production standards.

13 MR. CHAPMAN: Yeah. This transcript's  
14 from 2002, 2004, 2005, and 2006.

15 MR. RIDDLE: They began in 2002.

16 MR. CHAPMAN: There was one in 2002.

17 MR. RIDDLE: Yes.

18 MR. CHAPMAN: There was an out year in  
19 2003 but those were minutes.

20 MR. RIDDLE: That's when they first  
21 started.

22 MR. CHAPMAN: Yes.

1 Any other questions?

2 (No response.)

3 MR. CHAPMAN: Jim, thank you for your  
4 thoughts.

5 MR. RIDDLE: Thank you. And thanks  
6 for your service, all of you. It's a hard job.  
7 I really respect and appreciate what you do.

8 MR. CHAPMAN: Charlotte, you're up  
9 next, with Emily Musgrave on deck.

10 MS. VALLAEYS: Good evening. My name  
11 is Charlotte Vallaeys and I'm a Senior Policy  
12 Analyst with "Consumer Reports."

13 "Consumer Reports" is an independent,  
14 non-profit organization. We work side-by-side  
15 with consumers to create a fairer, safer, and  
16 healthier world. We work in many areas,  
17 including efforts to create a safe and  
18 sustainable food system. In many ways the  
19 organic food system aligns with our vision of a  
20 better food system. And we believe the integrity  
21 of the organic label is worth protecting and,  
22 where warranted, a standard should be improved.

1           There are several votes scheduled at  
2 this meeting that could improve the organic  
3 standards and ensure they meet consumer  
4 expectations. Sodium phosphate, an artificial  
5 ingredient, should be removed from the National  
6 List.

7           Our 2015 Consumer Survey found that  
8 avoiding artificial ingredients is an important  
9 objective for 79 percent of consumers. And this  
10 is especially important for consumers when they  
11 purchase foods labeled organic, with 86 percent  
12 saying that they expect organic foods to be free  
13 from artificial ingredients.

14           A high intake of phosphorus is  
15 associated with negative impact on bone, kidney,  
16 and heart health. Also, the prohibition of  
17 sodium phosphate in other standards, including  
18 the EU and Japan, shows that it fails to meet the  
19 essentiality criterion in OFPA.

20           And our 2016 Consumer Survey showed  
21 that 70 percent of consumers think that the USDA  
22 should not permit the use of non-organic

1 ingredients if they are not deemed essential.

2 We strongly support the proposal to  
3 include cisgenesis, intergenesis, and  
4 agroinfiltration in the terminology for excluded  
5 methods, and to exempt the techniques of marker-  
6 assisted selection and transduction. And we  
7 think transposons should be on the excluded  
8 methods list as well.

9 We support the Livestock  
10 Subcommittee's proposal to remove oxytocin from  
11 the National List. In our 2015 survey we found  
12 that 82 percent of consumers think that the  
13 federal organic standards should prohibit the use  
14 of antibiotics and other drugs.

15 For this reason also, and because we  
16 think that eliminating the routine use of  
17 antibiotics in animal agriculture is a critical  
18 step in protecting the effectiveness of  
19 antibiotics for public health, we strongly urge  
20 the NOSB's Livestock Subcommittee to begin work  
21 on developing a recommendation prohibiting all  
22 antibiotic use in organic poultry production.

1                   And finally, last but not least, we  
2                   are not opposed to hydroponic production, but we  
3                   are opposed to products of hydroponic systems  
4                   being labeled as organic and using that seal when  
5                   those crops can be grown in soil. So we urge the  
6                   NOSB to support the Crops Subcommittee proposal  
7                   on hydroponics and container growing.

8                   Thank you for considering our  
9                   comments. And thank you for your work.

10                  MR. CHAPMAN: Harriet.

11                  MS. BEHAR: Have you done any consumer  
12                  research on how consumers feel about hydroponics  
13                  as far as having the organic label? Has there  
14                  been any research on that?

15                  MS. VALLAEYS: No, we haven't done a  
16                  consumer survey in the last year. So we haven't  
17                  asked that question specifically.

18                  MR. CHAPMAN: Any year past consumer  
19                  surveys speak about soil?

20                  MS. VALLAEYS: We never asked that  
21                  question. We, we have about five questions that  
22                  we ask, and soil was never part of that.

1           MR. CHAPMAN: I had a question about  
2 you were talking about sodium phosphate and you  
3 referenced that because they're not on the  
4 European and Japanese lists they're not  
5 essential. There's a lot of differences between  
6 the materials lists internationally. For  
7 example, both those, Europe for sure, list  
8 carrageenan on the list of material that we chose  
9 to remove. And Europe itself doesn't restrict  
10 the use of these non-organic substances to just 5  
11 percent in formulation, it's open to any  
12 percentage of the formulation.

13           So, given these large differences in  
14 our lists, is that really the good place for us  
15 to look to make these determinations?

16           MS. VALLAEYS: Wait. I'm confused  
17 about you said they're on the list but they're  
18 still allowed in the European Union?

19           MR. CHAPMAN: The European Union, you  
20 know, allows carrageenan. That was the --

21           MS. VALLAEYS: Right.

22           MR. CHAPMAN: -- substance that your

1 organization has lobbied us prior to remove. We  
2 recommended its removal. We'll see what happens  
3 in the further rulemaking steps.

4 But that's a difference between our  
5 lists, much like sodium phosphate's a difference  
6 in Uruguay.

7 MS. VALLAEYS: That's interesting.  
8 Okay.

9 Yeah, well, so sodium phosphate if  
10 it's prohibited, and in the EU and in Japan, and  
11 those markets are still served pretty well by,  
12 right, organic products, to us that shows, that  
13 just raises questions about is it really  
14 essential. And so we have more details in our  
15 written comments. But combining that with the  
16 fact, for example, that you can find products in  
17 the U.S. where very similar products will not  
18 have sodium phosphate; right? They will have  
19 found other ways, whether it's other ingredients  
20 or they just don't use it, and it maybe tastes  
21 slightly different. Or it has certain, you know,  
22 certain differences but it can still be done.

1           So I think that we just need to look  
2 very closely at what it means to be essential  
3 versus is it useful. Because it's certainly  
4 something can be very useful but not, that's not  
5 the same as being essential.

6           MR. CHAPMAN: Yes. I would just  
7 advise that we need to keep close attention to  
8 the European list as a reference for other  
9 substances they allow in the amount of a non-  
10 organic substance in there. And so it may not be  
11 a comparable situation since American handlers  
12 are restricted to a 5 percent usage of that non-  
13 organic substance, where in Europe they could use  
14 6, 10, 20, 40, 50 percent of the product could be  
15 that product. It's a substantial difference.

16           Sue.

17           MS. BAIRD: Sorry, and I may just not  
18 have heard you correctly, but I thought that I  
19 heard you urge us to prohibit antibiotics in  
20 poultry?

21           MS. VALLAEYS: Yes. So we've been  
22 urging that for many years.

1                   Currently organic producers can use --

2                   MS. BAIRD: Oh, you mean --

3                   MS. VALLAEYS: Yes.

4                   MS. BAIRD: I'm sorry. Because I was  
5                   thinking there's no antibiotics in poultry.

6                   MS. VALLAEYS: It starts on day two.

7                   MS. BAIRD: Yeah, okay. Yeah.

8                   MS. VALLAEYS: Right. And that for us  
9                   has been when we explain labels to consumers and  
10                  we try to explain organic, the fact that we have  
11                  to put in parentheses "organic prohibits  
12                  antibiotics," but I always have to tell the  
13                  magazine writers, no, you need to put a  
14                  parentheses in there "except for poultry prior to  
15                  day two." And so if we could just get rid of  
16                  that and make it consistent and uniform so that  
17                  we can say to consumers organic means no  
18                  antibiotics period, that would be --

19                  MS. BAIRD: Thank you. I'm sorry, I  
20                  misunderstood what you were saying.

21                  MR. CHAPMAN: Ashley, and then we'll  
22                  have to stop there.

1 MS. SWAFFAR: Before I get off this  
2 Board, Charlotte, that is my goal.

3 MS. VALLAEYS: Thank you.

4 MR. CHAPMAN: Thank you, Charlotte.

5 MS. VALLAEYS: Thank you.

6 MR. CHAPMAN: Appreciate it.

7 Emily is up next followed by Karl  
8 Hammer. Emily if you could start with name and  
9 affiliation for the record.

10 MS. MUSGRAVE: Good evening. My name  
11 is Emily Musgrave. I am the Organics Program  
12 Manager at Driscoll's. Thank you for this  
13 opportunity to comment on the Crops Subcommittee  
14 proposal hydroponics and container growing  
15 recommendations.

16 My comments focus on the container  
17 growing recommendations section. As an avid  
18 supporter of the organic industry, Driscoll's  
19 requests the Board vote no on this proposal.

20 The organic movement centers on  
21 principles of inclusion, environmental  
22 stewardship, and sustainable management of

1 agricultural lands, while providing healthy,  
2 nutritious food to consumers. Growers pride  
3 themselves on taking advantage of nature's  
4 ecosystem services. Although organic farmers use  
5 tried and tested methods, such as integrated pest  
6 management processes, they are also champions of  
7 innovation and are eager to embrace technologies  
8 such as container production that allow them to  
9 grow more food in an environmentally sustainable  
10 way.

11 We believe this proposal, which  
12 mandates prescriptive requirements for container  
13 production, would stifle much-needed innovation.  
14 The vast majority of container producers would  
15 not be able to meet the requirements of this  
16 proposal and would therefore be classified as  
17 hydroponic and prohibited from obtaining organic  
18 certification.

19 The proposal limits growers' nitrogen  
20 usage, which is problematic when considering  
21 enforcement during the organic auditing process.  
22 You may remember the now-expired NOP rule that

1 limited growers' usage of Chilean sodium nitrate  
2 to 20 percent. Growers were required to document  
3 how much sodium nitrate they used annually during  
4 their organic inspections. This proved  
5 challenging in many ways, including how the rule  
6 was enforced through organic inspections.

7           The nitrogen requirements of this  
8 proposal would create problems similar to the  
9 sodium nitrate rule with regards to enforcement.  
10 It would halt progress, creativity, and  
11 innovation of the organic sector. Container  
12 producers who meet the standards set forth by the  
13 Organic Foods Production Act and the National  
14 Organic Program are already producing healthy  
15 organic foods in a sustainable way. They should  
16 not be denied organic certification because they  
17 do not meet the overly prescriptive requirements  
18 of this proposal.

19           Allowing innovation and creativity is  
20 essential to building a system that is even more  
21 sustainable and environmentally responsible.  
22 Driscoll's would welcome container production

1 standards in line with the core principles of  
2 organic production that allow growers to adjust  
3 their systems based on the conditions of their  
4 specific site.

5 Organic container growers embrace the  
6 opportunity to be more sustainable, to use less  
7 water, less inputs, and mitigate and reduce the  
8 stress on already over-used natural resources.  
9 Let's empower our farmers' desire to produce  
10 organic food in sustainable ways while preserving  
11 our agricultural landscapes, natural resources,  
12 fostering creativity, and using technological  
13 advances.

14 We ask that the Board help keep these  
15 paths of innovation open and vote no on this  
16 proposal.

17 I thank you for your service and for  
18 your consideration of my comments.

19 MR. CHAPMAN: Dave.

20 MS. MUSGRAVE: Questions?

21 MR. CHAPMAN: Dave, Steve. I'm going  
22 to cut it off so raise your hands now.

1 All right, Dave and Steve.

2 MR. MORTENSEN: Yeah. You've probably  
3 been here this afternoon and heard a lot of the  
4 presentations. I've been spending a lot of time  
5 with a group of students reading about the carbon  
6 footprint of hydroponic production. And in  
7 several meta-analyses the carbon footprint ranges  
8 from 2.5 times the carbon footprint of soil to in  
9 excess of 100 times the carbon footprint of crops  
10 grown in soil.

11 Could you tell us how that's a  
12 sustainable mode of production then, given the  
13 concern we have about greenhouse gases and fossil  
14 fuel use in any form of life, whether it's  
15 transportation or agriculture?

16 MS. MUSGRAVE: Yeah, that's a really  
17 great question. I'm going to touch a little bit  
18 on it. But actually we have Ian Justus, a  
19 colleague of mine, speaking, and he would be more  
20 of the subject matter expert on this.

21 But I do know that what was stated  
22 before saying that, you know, because container

1 plants are in a media of, you know, coco and  
2 coir, that type of thing, that they are not  
3 absorbing carbon. And I believe that is  
4 incorrect. The plants are actually sequestering  
5 carbon.

6 So I will leave it at that and I will  
7 let Ian, he's the one you want to go into more  
8 detail on that question.

9 MR. MORTENSEN: Okay. I'll pursue it  
10 with him.

11 MS. MUSGRAVE: Yes, please ask.

12 MR. MORTENSEN: I'm just going on the  
13 published literature with these ranges, and it's  
14 really striking. Actually the more I look into  
15 it, the more surprised I am at the difference  
16 between an in-soil and otherwise crops.

17 MR. CHAPMAN: Thank you, Dave.

18 Steve.

19 MR. ELA: Just Ashley's been asking my  
20 questions. So how -- what is your crop rotation?  
21 How do you get around that?

22 MS. MUSGRAVE: Well --

1                   MR. ELA: You're growing perennials,  
2                   so.

3                   MS. MUSGRAVE: Right. So the crop  
4                   rotation obviously for blueberries, a perennial  
5                   crop, growers in the soil aren't rotating the  
6                   base. And so the way we do it is we follow the  
7                   organic system plan by our certifier.

8                   You know, they come out there and they  
9                   say, Do you have cover crops planted in between  
10                  the furrow? Do you have beneficial plantings?  
11                  Do you have hydros?

12                  So, I have seen container production  
13                  fields and soil fields right next to each other  
14                  and they are following the exact same system  
15                  plan, organic system plan, and they meet the  
16                  letter of the law because blueberries aren't --  
17                  you don't rotate blueberries, but you do other  
18                  things that are included in the organic system  
19                  plan like having a cover crop in between the  
20                  furrow, or beneficial plantings.

21                  MR. ELA: So are you saying in between  
22                  your containers you have cover crops planted?

1 MS. MUSGRAVE: Yes, they could do  
2 that, absolutely.

3 MR. ELA: But do you? Not could.

4 MS. MUSGRAVE: I don't -- I'm not sure  
5 entirely as far -- Actually, you know what, we do  
6 have a container grower who's planting cover  
7 crops. And they also have beneficial plantings  
8 all along the side of their, their operation.

9 MR. ELA: Is that the standard  
10 practice?

11 MS. MUSGRAVE: You know, it's a  
12 practice. I'm not certain if every single grower  
13 is. But they have to, in order to be compliant  
14 with the organic system plan they must be doing  
15 one of those, one of those choices. So they are,  
16 you know, being inspected by organic inspectors,  
17 and in order to comply they have to be doing one  
18 of those practices. So, yes, they would be doing  
19 one of those practices.

20 MR. CHAPMAN: Thank you.

21 Up next is Karl Hammer followed by Tom  
22 Barrett.

1 Karl, if you would start with your  
2 name and affiliation.

3 MR. HAMMER: I am Karl Hammer. And I  
4 own and operate a business in Montpelier,  
5 Vermont, called the Vermont Compost Company. And  
6 I was -- I started my farming in Vermont in my  
7 late teens, '68 or so, on a hill farm, shallow to  
8 bedrock. I had to clear a lot of the land. It  
9 had been in my family since I was about 8 or 9  
10 years old, but it was definitely a run-out old  
11 hill farm at the top of the watershed.

12 Pastures were grown to trees. And I  
13 cleared some of the wrong land first because it  
14 was easier to see that there was land there. And  
15 started where it was a 6- or 8-cow farm at the  
16 best, at the most rather, which wasn't so out of  
17 character at that time there. But the biggest  
18 farm enclosure ever was a 30-cow farm.

19 But I learned a lot about manure and  
20 my need for it and the limits of shallow soils.  
21 And I quickly realized I couldn't sell milk so I  
22 decided to grow vegetables. And I was afraid of

1 chemicals. And I started sharecropping manure --  
2 hay on both sides of the hill and making cattle.  
3 And long story short, now many years later I  
4 provide compost and container media to now 600  
5 commercial growers, many of them certified  
6 organic.

7 And so I have a -- I traffic in soil.  
8 We talk a lot about soil and ethics here. There  
9 are only a couple of us in the room, we had a  
10 couple soil traffickers had supper together last  
11 night -- there are only two of us around -- that  
12 actually sell material. And, you know, when we  
13 started we endured the dismissive derision of  
14 being "muck and magic" farmers. Here 40, more  
15 than 40 years later now, almost 50 years later I  
16 am a "muck and magic" farmer. I'm proud of it.

17 I believe that my knowledge is dwarfed  
18 by my ignorance, and that we had been warned  
19 about this many times, but we may be in an  
20 interesting condition in terms of humanity's  
21 history.

22 I now have customers in Oklahoma and

1 Iowa taking a little bit of our terroir and  
2 germinating seed in it. And so I've been  
3 watching this whole question of containers and  
4 amendments. You know, I'd ask you to consider  
5 the scale, the scale issues between a container  
6 and soil. They are orders of magnitude. And  
7 that matters in all of this.

8 I oppose the liquid feeding. I know  
9 that media can be prepared to produce without  
10 amendment in various confining situations.

11 I'll leave it at that. And maybe a  
12 couple questions would be welcome.

13 MR. CHAPMAN: Thank you.

14 Sue then Steve. Anyone else? Asa.

15 MS. BAIRD: I have a dear friend in  
16 Illinois who has some operations in Missouri that  
17 makes bio-compost. And if I told you his name  
18 you'd probably know it. But they also make --  
19 they use that same compost and they make a  
20 compost, liquefied compost manure, or whatever  
21 you want to call it. And he assures me that that  
22 has the same components, other than it's

1       liquefied, as the dry does.

2                   And, therefore, he believes that that,  
3       that solution run through an NFT system or  
4       whatever would have the same kind of biology as  
5       his dry compost does. Could you comment on that,  
6       please?

7                   MR. HAMMER: Yeah. Well, liquid  
8       substrates and their biology and their mechanics  
9       depend a lot on their moisture content overall.  
10      So liquids drives air from media. It may well be  
11      possible to transport beneficial materials into a  
12      soil as a slurry. And that, we can get into a  
13      long discussion about that.

14                   Merely having compost in a circulating  
15      liquid is not at all analogous to the half  
16      billion year model represented by soil, plants,  
17      root, fungal, biological interaction. It isn't  
18      inherently a bad thing as an instead-of-soil.

19                   You know, there may come a moment  
20      where the coir does become in some form a soil.  
21      And we keep -- we are in a time of anthropogenic  
22      pedo -- anthropocene pedogenesis. We are as big

1 an actor as plants now. We're a species that  
2 stepped out of the soil less than 2 million years  
3 ago, you know, in a system that is half a billion  
4 years old.

5 And we have been warned in -- you  
6 know, I came prepared to read a short Vedic  
7 proverb about this instead of what I did say.  
8 Being warned about the collapse of soil is  
9 disrespected. And I don't, you know, we worked  
10 hard to build the organic label. It never  
11 occurred to us that our, my own business slogan  
12 taken from Sir Albert Howard is shamelessly  
13 taken, "feed the soil," because we understood  
14 that feeding -- we don't make soil, we assemble  
15 and --

16 MR. CHAPMAN: Can you wrap up.

17 MR. HAMMER: -- participate in a  
18 mystery.

19 MR. CHAPMAN: Thank you.

20 Steve.

21 MR. ELA: So I just, I didn't  
22 completely follow. But you said you sell compost

1 to a number of container growers. And but then  
2 later, and you said later that you felt like they  
3 could use your compost mix to grow crops without  
4 additional feeding. Did I hear that right?

5 MR. HAMMER: Yes. We do -- and I'm  
6 talking about a broad range of grower and grower  
7 types. So, yes, volume of media is a very  
8 important issue technically in this discussion.  
9 And as a media seller I often find myself in the  
10 uncomfortable position of recommending more media  
11 because it gives much better result, more buffer  
12 capacity you know.

13 And if you look at the scale change to  
14 a little cell and then map what a -- the foraging  
15 potential in a soil situation, in a soil the  
16 plant can move around certain things. It has a  
17 lot more opportunity.

18 When you make scale changes that are  
19 decimal orders of magnitude it really changes all  
20 of the physics and the biology. So, and I  
21 emphasize that point because, yes, most of my  
22 grower, many of my grower customers predominantly

1 they take our media, they use it for seedling  
2 production, and they don't amend. They up-pot,  
3 they go as the root fills the cell that indicates  
4 it's time for more forage opportunity.

5 We, when I say we work with a lot of  
6 different people, we work on distressed  
7 substrates, asphalt parking lots, where we have  
8 to provide the whole media and food needs to be  
9 grown. And in a lot of those urban settings at  
10 this point you can't recommend that they allow  
11 the plants to forage because we know it's not  
12 safe.

13 Am I answering your question? What we  
14 do know is that our process of -- and we use a  
15 lot of compost as a first --

16 MR. CHAPMAN: Thank you. I'm going to  
17 have to move on to the next question.

18 Asa.

19 MR. BRADMAN: I have two questions.  
20 One, it sounds like you're selling compost to  
21 organic farmers and they're using it as a  
22 supplement, or maybe that's part of it. And then

1 actually you just raised a good point about using  
2 your soil media for growing food on asphalt and  
3 things like that which would basically inherently  
4 be a container or raised bed system.

5 And does that mean you would support  
6 the container system? I mean, I think here's a  
7 real issue where there's some --

8 MR. HAMMER: I have strong hesitation  
9 in calling container systems on asphalt organic,  
10 partially because of international rule. You  
11 know, as I understand European rule, if you're  
12 going to call a container growing thing organic,  
13 the container and the media come so that the  
14 customer can see it for themselves. And I think  
15 that's a reasonable thing.

16 When I say we work with people in  
17 distressed soil, frequently in those projects  
18 they're pretty local projects and I don't know  
19 that they, that they -- that calling that organic  
20 is important. I don't know that it should never  
21 be called organic. I think the standard, I think  
22 a standard about how much nutrition can be

1 delivered by liquid system, or by any system,  
2 because we know that you can -- if a volume of  
3 media is sufficient and it's properly made then  
4 it can, it will be soil and it can move on and  
5 rotate. You can actually increase its mass by  
6 proper rotations in sequence.

7 MR. CHAPMAN: Thank you.

8 MR. HAMMER: We're working with  
9 microgreens people, and a number of them, and  
10 this is coming up a lot.

11 MR. CHAPMAN: Thank you.

12 MR. HAMMER: And we are really  
13 starting to try to develop rotation plans.

14 MR. CHAPMAN: We're going to have to  
15 move along. Thank you.

16 MR. HAMMER: Sorry.

17 MR. CHAPMAN: Thank you very much.

18 Asa, do you have one last question or  
19 did you get it answered? Thank you.

20 Okay, thank you very much.

21 MR. HAMMER: Thank you. And thank you  
22 for your work. It's a knotty question.

1 MR. CHAPMAN: Thank you. Thank you,  
2 Karl.

3 Up next is Tom followed by Angela  
4 TenBroeck -- sorry if I butchered that -- on  
5 deck.

6 Tom, if you can start with your name  
7 and affiliation, please.

8 MR. BARRETT: Yeah, sure.

9 Good evening everybody. My name is  
10 Tom Barrett. I'm a stakeholder and I actively  
11 manage Allen Farms located in Westport,  
12 Massachusetts. We are a certified organic farm  
13 producing soil-grown herbs, greens, vegetables,  
14 and fruit for wholesale retailers and farmers'  
15 markets as well. The farm was founded by my  
16 mother 30 years ago and has been certified  
17 organic since 1989.

18 This is my first appearance at an NSOB  
19 meeting. And I thank you guys for doing what you  
20 do. And I'm honored to be here to have the  
21 opportunity to speak.

22 Allen Farms was founded on the love of

1 quality food. Organic by belief and choice at  
2 first, before realizing that being certified  
3 organic will allow others to acknowledge the  
4 quality and at the same time be willing to pay  
5 the additional costs incurred with growing  
6 organic, because they most likely as well share  
7 and want to support the same beliefs behind  
8 organic growing.

9 By selling the farm's produce at  
10 farmers' markets, I am able to get immediate,  
11 honest feedback from all my consumers. And it's  
12 becoming very evident that the USDA certified  
13 organic label is starting to lose its clout. The  
14 younger generations are growing increasingly more  
15 concerned about their health and eating healthier  
16 food, seeking and now expecting transparency,  
17 reading labels as they are concerned about  
18 ingredients more than ever before, especially  
19 when it comes to their food.

20 Many big businesses think that they  
21 can influence markets and industries to trick or  
22 deceive consumers with savvy labeling tactics.

1 They are unfortunately creating confusion and  
2 questions amongst consumers and, in turn,  
3 diluting the credentials even, if applicable, to  
4 the certifying agencies, all while these large  
5 corporations are just focused on cashing in on  
6 the trends, as we have seen double-digit growth  
7 in organic demand over the past two decades.

8 Let's not make this identity issue any  
9 worse and take the opportunity to set the  
10 precedents and create a turning point through  
11 strengthening our USDA label and its symbolism.  
12 Standards should be getting more simple, yet  
13 vigorous, so the majority of the population can  
14 easily understand it.

15 Now I fully support technology and  
16 innovation. With that, we get hydroponic and  
17 other mediums of growing. I see alternative  
18 methods as a great way to be able to increase our  
19 domestic production. This also allows for small  
20 scale home growers to be able to produce their  
21 own food when outdoor space is not available.

22 So, with the advances in farming and

1 the growing concern for quality food it is  
2 becoming evident to my peers and myself that the  
3 oversight for these methods needs to advance in  
4 sync. Hydroponic growing is not organic by the  
5 founding beliefs behind organic farming. As a  
6 grower and a consumer it's astonishing that these  
7 are even comparable under one blanketed guise of  
8 organic. We need to resolve this current  
9 situation that is clearly spiraling out of  
10 control with money accelerating the wild fire.

11 We need to resolve the integrity and  
12 do something before it jeopardizes the youth  
13 future and reliance and trust in the system.

14 MR. CHAPMAN: Thank you.

15 Questions? Emily.

16 MS. OAKLEY: I have the same  
17 question. I'm not sure how familiar you are with  
18 the Crops Subcommittee proposal, but we have a  
19 motion for containers. And I'm wondering if you  
20 would support compromise of containers or if you  
21 would like to see just grown in the soil in the  
22 ground?

1                   MR. BARRETT: No chance. I recommend  
2 to the Board to keep this simple and only allow  
3 soil-grown produce to be certified organic. I  
4 would like for other small scale farmers, young  
5 and up-and-coming farms, including myself, to  
6 have the opportunity to compete on a level  
7 playing field amongst soil-grown organic produce.

8                   Bring back the true identity of our  
9 label, so consumers can be assured of their  
10 purchases by seeing the USDA label on there and  
11 knowing exactly what it means rather than having  
12 the meaning so complex that no one understands  
13 exactly what organic is anymore.

14                   MR. CHAPMAN: Thank you.

15                   We're going to move on to our next  
16 commenter Angela. And after that we have Ian  
17 Justus on deck.

18                   MR. BARRETT: And just for the  
19 labeling, there's about four different things on  
20 this little gummy bear package. And you guys  
21 just look up the different things on there.

22                   MR. CHAPMAN: Thank you.

1 MS. TENBROECK: Hello. Are we ready?

2 MR. CHAPMAN: Is the mic on?

3 MS. TENBROECK: Can you hear me?

4 MR. CHAPMAN: Yes. Perfect.

5 MS. TENBROECK: Hello. My name is  
6 Angela TenBroeck, and I'm a fourth generation  
7 farmer. I am the owner of THF Hubery and I am  
8 currently the Executive Director for the Center  
9 for Sustainable Agricultural Excellence and  
10 Conservation. I have operated, owned, and been  
11 successful at attaining SQF Level 3 certification  
12 for a large aquaponics farm in this region of the  
13 country.

14 Today I stand before you to encourage  
15 you with data and science. The new Food Safety  
16 and Modernization Act changed the way many  
17 farmers farm. The FSMA encourages farmers,  
18 consumers, government officials, and food safety  
19 auditors to look at science. It is my suggestion  
20 that the NOSB does the same.

21 We can no longer hold out that a  
22 facility can't be organic because they don't

1 plant in the dirt. We must think of our future  
2 and our children's future.

3 We have -- I have always pondered as a  
4 farmer why aquaponics wasn't considered organic.  
5 So I went to organic meetings with certifiers and  
6 asked why was my farming technique not considered  
7 organic? And the simple answer was: wasn't grown  
8 in soil.

9 I went back to my farm, consulted with  
10 industry experts, and asked each one: What should  
11 I do to prove my farm is food safe and organic?  
12 Their answers were you need to be held to the  
13 same standards as the ground growers and other  
14 controlled environment ag people are held.

15 So, I went to all the food safety  
16 trainings: HACCP, Ag Water, SQF, BCQI, USDA Food  
17 Safety, and anything else I would take myself to.  
18 Never hearing any reasons why I, as an aquaponics  
19 farmer -- excuse me -- could not get this organic  
20 certification, something other than this raw  
21 manure and soil.

22 So, to the first point, I conducted

1 baseline data of more than 20 months at the farm  
2 to include total coliform, e coli, salmonella,  
3 and listeria, and the produce, and the nutrient  
4 water to never get a positive result.

5 So, I get to these meetings and I meet  
6 all these lovely people. And I hear your  
7 passionate ideas about what is organic. So I  
8 agree, we are different. But let me take it  
9 further as I have worked in this quest to be  
10 organic.

11 The next point I have is that my  
12 plants are not planted in soil, so therefore they  
13 are not natural or do not have natural soil  
14 components. I reached out to my web of  
15 scientists and asked: Is this true?

16 So Dr. Ingram has said that, yes, my  
17 produce and the soil underneath my plants -- the  
18 water that I speak of -- did have in fact the  
19 food web that was required as indicated in soil,  
20 the normal food web that would be aerobic and  
21 would generate more microbes to grow my plants.

22 On this personal research, as well as

1 anecdotal research information, I can only  
2 conclude that nutrient water that is below my  
3 plants in aquaponic systems is as or more organic  
4 than we have been given credit. So, given this  
5 information maybe we do need a different label.

6 To conclude, we can no longer work in  
7 this us versus them approach. We must research  
8 what is being conducted in public and private  
9 facilities, to work for our futures, our  
10 counties', our country's future, food security  
11 and safety.

12 MR. CHAPMAN: Thank you.

13 Questions?

14 MS. TENBROECK: Carbon footprint  
15 question? I'm ready.

16 MR. BRADMAN: I'll ask that. And in  
17 terms of the fertility, so you're bringing in  
18 fish food and feeding the fish and then you're  
19 using the fish waste to --

20 MS. TENBROECK: Yeah.

21 MR. BRADMAN: -- culture your plants.  
22 So it's kind of a hydroponic system with a animal

1 source essentially?

2 MS. TENBROECK: Yes. So, I, great,  
3 great way of describing aquaponics. So, many  
4 people think of aquaponics as this thing people  
5 do in their backyard where there's all these  
6 fishes swimming below people's plants. That is  
7 not what I do.

8 So what we do is is we take the fish  
9 poop, as you would call it, push it through an  
10 intense bioreaction process so there are no  
11 flocculents in the water. Because the big deal  
12 is is that we are concerned about food safety.  
13 Everybody knows that it's a big concern with  
14 aquaponics. Is it going to make me sick?

15 So, we've overcome that. Okay? And  
16 so from there it becomes hydroponic, deep water  
17 culture, NFT, a proprietary thing that I  
18 developed as far as the grow channel, I mean,  
19 that we work in.

20 MR. BRADMAN: What are your positions  
21 on the proposals that are before the Board right  
22 now?

1 MS. TENBROECK: So when I got here I  
2 was a little bit like Why can't we join? I'm  
3 going to be perfectly honest with you. I sat  
4 around and listened to this and I'm thinking we  
5 should just go ahead and do our own label.

6 I don't disagree that maybe we  
7 shouldn't have a hydro -- maybe not call it  
8 organic, maybe we come up with some other  
9 creative label for ourselves.

10 So I'm going to ponder on this because  
11 I am fully, I fully understand these people's  
12 work. I don't -- I get they think we're on their  
13 coattails. And maybe we are. That's not my --  
14 that's not for me to decide.

15 MR. BRADMAN: Do you think that label  
16 should be under the National Organic Program?

17 MS. TENBROECK: I do. I think there  
18 need to be standards. I think there needs to be  
19 a centered set for food safety. Okay, we all  
20 agree on that, that was done with FMSA.

21 But I also believe that there should  
22 be an environmental standard for the manner in

1       which we treat, you know, our fish; the manner in  
2       which we treat our grounds around our facilities.  
3       All the things that they are asking for that they  
4       have done we are interested in as well. So a lot  
5       of the things, we all agree on a lot of the same.  
6       This is a movement. Okay. I've heard that over  
7       and over again. I agree as an aquaponics  
8       researcher and person that, yes, in fact I agree  
9       with the fact that, you know, there's a lot of  
10      this stuff that you're talking about I agree  
11      with.

12                    But I also agree that my food is  
13      readily available, it can feed the masses, it's  
14      safe, it's clean, and I can grow it in one spot  
15      and I can grow more than a ground grower. I get  
16      it, okay. But that's just what we do. So we do  
17      need a different label. And I'm anticipating  
18      that's probably where I will move towards.

19                    And I will meet with the Aquaponics  
20      Association this weekend on that.

21                    MR. BRADMAN: So are you concerned  
22      about consumer confusion over labels?

1 MS. TENBROECK: Yeah. Actually I  
2 would like -- so I always believe on a business  
3 side that we must do a marketing campaign. So  
4 forgive me, aquaponics -- or organic folks, we  
5 haven't done a good job with organics in  
6 explaining what it is. So, therefore, that would  
7 cause in some ways people -- I, when I talk with  
8 people about organic this is what they think:  
9 It's safe. My family can eat it.

10 Okay, what else? Well, tell me about  
11 it? Tell me about this, tell me about organics;  
12 what is it?

13 They don't know the story of these  
14 guys that have worked their whole lives trying to  
15 rehab soil. They don't -- they don't get that  
16 story. And I don't mean to be disrespectful.  
17 I'm not trying to be. I know the work that they  
18 have put in. I've followed them for years.

19 MR. CHAPMAN: Thank you.

20 MS. TENBROECK: Uh-huh.

21 MR. CHAPMAN: Dave, did you want to  
22 ask the carbon question?

1 MR. MORTENSEN: No, I'm not.

2 MS. TENBROECK: All right. Thank you  
3 so much for your time.

4 MR. CHAPMAN: Wait, wait, wait. Sue  
5 has a question for you.

6 MS. BAIRD: I'm so sorry for  
7 commenting on this thing.

8 MS. TENBROECK: Hi, Sue. Hi.

9 MS. BAIRD: You have presumed all  
10 along that you're growing organic hydroponics.  
11 What is the difference in an organic hydroponics  
12 and a conventional hydroponics? And is there a  
13 difference?

14 MS. TENBROECK: Yes. If you want to  
15 talk about the fact that what we're doing is  
16 hydroponic, okay. Technically we have it come  
17 through the bioreactor, and we have fertilizer  
18 that comes out of that.

19 So if you want to say that those, that  
20 greenhouse that's full of nothing but those fish  
21 water, nutrient soil, if that's in fact -- we're  
22 just going to talk about hydroponic, eliminate

1 the fish -- I would think that something that  
2 poops, and we take it through the cycle, the  
3 nitrification process, and it's in fact able to  
4 make its readily available nutrients to the  
5 plants, and they're able to do what they need to  
6 grow, the nutrients are readily available there,  
7 the protozoas are all there, the bacteria, you  
8 know, the uptake and such. So yes, I think that  
9 is different than somebody going to a Dosatron,  
10 okay, I need a 1 to 50 or 1 to 1,000, and I need  
11 -- I put, I only put some, some battery acid in  
12 it, and that can be considered organic. I'm  
13 sorry, I think that what we do is organic.

14 MR. CHAPMAN: Thank you.

15 Actually, I'm going to ask you if you  
16 could briefly talk about the carbon impact of  
17 your operation.

18 MS. TENBROECK: So, the University of  
19 Michigan does a great job on this. So if you've  
20 ever been interested in this we -- and the  
21 operation -- I have to be honest with you, I sold  
22 my operation in February -- but the operation was

1 run on a gravity flow. And so in general for ag  
2 situations vegetables take up 4.9 percent of the  
3 total carbon footprint, whereas dairy and beef  
4 take up, you know, 47. So I always am pondering,  
5 you know, let's talk about this, we have  
6 greenhouse growers and we have the energy, the  
7 coal power that it takes to turn those fans and  
8 such. That is an issue.

9 But let's also talk about the fact  
10 that if we're getting produce here in  
11 Jacksonville, from Salinas County it's 776 miles  
12 to my door. There's a carbon footprint imprint  
13 there. So I'm saying if you want to talk about  
14 carbon footprint, buy my local stuff. There's a  
15 bigger impact in local with the carbon footprint  
16 argument than there is anything else.

17 And so the source of this, it's the  
18 University of Michigan. They've really done a  
19 good job with this carbon footprint. And I would  
20 strongly suggest that you guys share that with  
21 the sustainable systems. It's the University of  
22 Michigan sustainable systems.

1                   MR. CHAPMAN: Thank you. Thank you  
2 very much.

3                   Up next is Ian Justus. No one is on  
4 deck which means Ian is all that is keeping us  
5 from trick or treating.

6                   (Laughter.)

7                   MR. CHAPMAN: Ian, I was really hoping  
8 you would dress up as a strawberry or other berry  
9 of your choice.

10                   I'm sorry. Ian, can you start with  
11 your name and affiliation for the record.

12                   MR. JUSTUS: Sure. Well, thanks for  
13 waiting.

14                   My name is Ian Justus. And I work  
15 with Driscoll's. I appreciate the opportunity to  
16 comment on the organic hydroponic container  
17 proposal today.

18                   My specialization at Driscoll's is  
19 focused on research and development relating to  
20 the development of new production systems, and  
21 agronomic consultation on all aspects of growing  
22 the four berry types in conventional, organic,

1 soil, and container.

2 At the end of this process, it will be  
3 my job to make the growing recommendation to our  
4 growers on how they can comply with the new  
5 container standards. And I can tell you as the  
6 current proposal stands, I really don't know how  
7 to container grow long-term perennial crops in  
8 this system as it, you know, it creates many  
9 management challenges.

10 I have heard through this process that  
11 the reasoning behind the 50 percent of the  
12 upfront nutrition is because this is how all  
13 organic soil should be managed. If I encountered  
14 an organic soil berry grower with this  
15 fertilization practice, it was my professional  
16 advice to change their practices.

17 And the reason for this is because of  
18 the high exposure to salinity to a young plant,  
19 the increase in vegetative growth that can occur  
20 with this that causes problems with disease, and  
21 harvest efficiencies, and that this release curve  
22 of the nitrogen will not match the uptake curve

1 of the plant. And this is going to lead to  
2 groundwater contamination and nitrate runoff.

3 This proposal dictates how to manage  
4 nitrogen fertility for all crops in a few  
5 sentences, and forces the grower to determine  
6 total nitrogen for the year by the day of  
7 planting. This really leaves little room for  
8 adjustment.

9 And I understand the Board's intention  
10 and the challenge here, but the complexity of the  
11 farming really cannot be simplified in this  
12 manner. There will be so many conflicts with  
13 different cropping systems. In particular, the  
14 Board should not be recommending such high rates  
15 of early nitrogen when the crop will be growing  
16 for over six months.

17 Our regional water quality boards  
18 would not support this method of fertilization.  
19 And California growers are responsible for  
20 managing nitrate runoff and percolation in their  
21 fields. I don't think the Board will like the  
22 reality this proposal will create. It will cause

1 more pollution, unfavorable root zone conditions,  
2 and encourage over-application of nitrogen.

3 The key to the thoughtful management  
4 of nitrogen fertilization is applying it based on  
5 crop development and matching the nitrate uptake  
6 curve for the given cropping system.

7 Driscoll's and its growers support a  
8 meaningful container standard. We urge the Board  
9 to send this back to subcommittee for further  
10 work. The topic has great impact on the future  
11 organic produce and deserves more work and  
12 attention. Farming practices inherently  
13 progress, and we need to send the right message  
14 to future generations of organic farmers.

15 This recommendation is counter to the  
16 current schools of thought. As board members you  
17 must ask yourself is it appropriate to be this  
18 broadly prescriptive on farming practices? If  
19 so, is this really how you want fertility to be  
20 managed? And does this proposal clearly define  
21 what regional conditions are acceptable for  
22 organic certification?

1 I really believe this creates a  
2 reality that directly conflicts with the organic  
3 principles of adjusting the scientific  
4 conditions, creating healthy root zone  
5 conditions, and being a good steward of the land.

6 I would like to thank the Board for  
7 all their service. And I would happily take any  
8 questions you might have.

9 MR. CHAPMAN: Thank you, Ian.

10 Steve.

11 MR. ELA: At the risk of standing  
12 between Tom and his candy. So normally, I mean,  
13 soil growers are in the soil. You have most of  
14 your fertility upfront. And you have cover crops  
15 and release curves; things are dynamic and  
16 cycling.

17 And I don't see that in the container  
18 systems. And that's, I mean, that's one of the  
19 differences. I hear what you're saying, you put  
20 this in the front, you're going to lose it  
21 because the plant -- your crop plant's the only  
22 thing in that system. But it seems like that's

1 one of the fallacies of this system as well.

2 So, could you comment on that?

3 And I would also like to know the  
4 water you put in, I'm assuming the plants don't  
5 always take up all the nitrogen. Where does  
6 that, I mean you have exudate, bypass, what are  
7 you doing with that water?

8 MR. JUSTUS: Sure. And I'll be fully  
9 honest with you. So, I mean, we really learned  
10 how to do containers from how we managed our  
11 soil. So in many cases, the growers are actually  
12 managing very similar to how you'd manage a soil  
13 blueberry planting versus a container blueberry  
14 planting, because it's more like an orchard than  
15 a rotating annual crop. Right? So there's no  
16 way to really till, turn over, or really affect  
17 the nutrient balance for the blueberry without  
18 applying it through the drip system.

19 You can do some top dressing. You can  
20 do some side shaking of the soil. And we do the  
21 same thing. We can't side shake in a pot but we  
22 can do top dressing. So we'll address it in that

1 manner.

2 And the blueberry root system in  
3 particular is really not expansive. It's not  
4 into the furrow. It's very isolated. There's  
5 not a good way to actually put it on. So that's  
6 basically the way we'll do it, we'll put compost  
7 on the top, or we'll top dress solid fertility.

8 But, you know, all these things are  
9 inputs. This discussion about the different  
10 types of nitrogen, solid versus liquid, really  
11 boils down to the complexity of the protein.  
12 That's what we're talking about. Right? Which  
13 one -- solid protein is a little more complex  
14 than liquid soluble protein, but they all have to  
15 really go through the nitrogen cycle, which  
16 happens in solution by the way.

17 So I mean that's just one challenge  
18 all perennial organic growers have, is how you  
19 keep maintaining that when you can't actually  
20 turn the soil over, you can't cover crop it,  
21 especially in particular like a blueberry, which  
22 is the majority of our organic container

1 production.

2 MR. ELA: And then the water?

3 MR. JUSTUS: And the water. So, we  
4 manage that very closely. And we -- usually  
5 we're targeting a daily percentage, actually.  
6 And that's basically the leaching fraction, the  
7 same thing you would have in soil. But where it  
8 goes is really it goes right below the container.

9 And probably the worst thing we could  
10 do for the soil in that field is to rob it of  
11 that water. All microbial life needs water so to  
12 live and thrive. And otherwise it would just be  
13 a desert underneath. And we put gutters -- which  
14 we could do, it would come at a great cost to the  
15 grower -- that would actually rob the soil of the  
16 exudate, the water.

17 But what we're not doing is hitting  
18 field capacity in that soil, so we're not  
19 actually getting down to the groundwater -- a big  
20 advantage in my opinion. When I look at the  
21 dynamics of what we can do in California and what  
22 will be regulated on, it's protecting that

1 groundwater. And we're not leaching into the  
2 groundwater, because we're not hitting field  
3 capacity.

4 In soil you pretty much hit field  
5 capacity in every irrigation cycle.

6 MR. CHAPMAN: Joelle.

7 MS. MOSSO: I had a question -- I'm  
8 over here -- I had a question on the four trophic  
9 levels. If you've had any time to look at that,  
10 the four trophic levels in the minority view?

11 MR. JUSTUS: Yes, I did.

12 MS. MOSSO: Speak to that as to  
13 whether or not that would be compliant in your  
14 system?

15 MR. JUSTUS: Yeah. Arguably, it  
16 really comes down to how you define a trophic  
17 level. I think even a conventional hydroponic  
18 system would have four trophic. We would way  
19 exceed those levels. And we're not growing in  
20 greenhouses; we're growing in open air tunnels.  
21 So the number of organisms that are present in  
22 our environment, especially our long-term

1 blueberry planting, is massive. We're probably  
2 at least ten.

3 We have soil arthropods, you know, it  
4 really depends on where is the production. Is it  
5 in the soil that we're not growing in, because  
6 that's full of life. Or is it, you know, there's  
7 tons of spiders, there's snakes even. I mean  
8 there's, it's there's a full range of  
9 biodiversity going on in the field because we're  
10 open. Can't keep things out even if we wanted  
11 to. So four would be very simple.

12 MR. CHAPMAN: Harriet.

13 MS. BEHAR: Okay. So in those  
14 blueberry fields are they -- I have visited some.  
15 I went to ecofarm, and you take the bus tour.  
16 And I know I've been to some -- quite a variety.  
17 And I've been to fields where they're covered in  
18 landscape cloth and there isn't any cover crops  
19 growing there. That's the first question.

20 The second question is: if the  
21 containers were full of compost, no inert, I  
22 think that they would meet that nitrogen need to

1 start with. But you're saying that that wouldn't  
2 work. And when the nitrogen is in a humus form,  
3 its leaching capabilities is much less.

4 So maybe you could address those two  
5 things.

6 MR. JUSTUS: Sure. So is there a  
7 specific question about the landscape cloth  
8 question?

9 MS. BEHAR: Yeah. Because the  
10 previous woman said she thought that there was  
11 cover crops growing between the rows and things  
12 like that. And that's not what I saw.

13 MR. JUSTUS: Yes. I'll tell you, it  
14 really depends on the operation. I work with all  
15 the growers. So when they first started they  
16 were like, What do we do? Right? It's always  
17 kind of a question, like, how should I lay my  
18 field out?

19 And some of them were like, well, I  
20 really don't want to deal with weeds. I'm going  
21 to cover it 100 percent.

22 And I can tell you the current school

1 of thought amongst the growers is that's not the  
2 way to do it anymore. In particular, I mean, in  
3 perennial plants, you have pruning clippings. So  
4 what do you do with the pruning clippings when  
5 you're done? You can't till it into the soil  
6 anymore because that cloth is there. It actually  
7 creates like a big challenge for them.

8 So pretty much everyone now leaves  
9 open the furrows, incorporates things into the  
10 soil, particularly pruning trimmings. You know,  
11 they cultivate to manage weeds, things like that.

12 So in that particular case, I mean,  
13 obviously there wouldn't be cover cropping in  
14 that area. But I think that meets the exemption  
15 in the standards. I'm not 100 percent because  
16 that's not my specialization.

17 And then regarding the compost  
18 question for the container, I mean for every mix,  
19 I mean, peat moss is how old? It's been  
20 composted for long, long year. Coir is also  
21 composted you could argue. But it comes down to  
22 the stability of your organic matter; right?

1           If you have totally unstable organic  
2 matter, you're going to lose all your porosity.  
3 And that's going to create problems for the roots  
4 and the microbes, because you obviously won't be  
5 done.

6           And then the other big challenge we  
7 see with it is that we're actually above the  
8 ground, and so we don't have very much mass. So  
9 because of that, that temperature fluctuation is  
10 with the diurnal flux. So our daily average  
11 temperature of the root zone is higher usually in  
12 a container. So what that means is that process  
13 actually happens quicker.

14           So with compost it would mean that we  
15 have basically a very large carbon fraction that  
16 isn't breakdownable, because otherwise you would  
17 just destroy the root zone conditions from lack  
18 of porosity. And then compost as well can be  
19 very inherently salty, so you really would need  
20 to manage what that is. And you would need a  
21 large part of it to be stable organic matter,  
22 which is basically what the media components are

1 using currently is stable organic matter, or more  
2 stable, even though it does break down over time.  
3 Very much so.

4 MR. CHAPMAN: Thank you.

5 Francis.

6 DR. THICKE: I think we have to clear  
7 something up. The proposal we have for  
8 containers is really is a de facto soil or  
9 compost requirement. We aren't expecting you to  
10 put all this nitrogen in this coconut coir.  
11 We're not that stupid. But you have to have  
12 something that has some stable nitrogen or has to  
13 -- a soil or compost has various stages of  
14 nitrogen composition, from humus to less  
15 recalcitrant to more label, a whole range, so  
16 that the curve, release curve is longer.

17 And people have, and they showed us  
18 how they could grow in 100 percent compost. Yes,  
19 if you're going to have a mushy compost, it's  
20 going to decompose. But you're going to -- you  
21 have to have something that's, just like your  
22 engineering your hydroponic system, you have to

1 engineer your compost system. And I think John  
2 Biernbaum is going to talk to us about that  
3 tomorrow.

4 So these are straw man arguments that  
5 make no sense. You know, we're not expecting you  
6 to put all your nitrogen in soluble form in the  
7 beginning of the year.

8 MR. JUSTUS: Agreed. But if you're  
9 going to lose the structure, right, if it breaks  
10 down then you lose the structure; right?

11 DR. THICKE: We'll hear more about  
12 that tomorrow from John Biernbaum. He's done a  
13 lot of research on that at Michigan State and has  
14 made compost that worked really well for that.

15 MR. JUSTUS: Yeah. So I would ask  
16 you, I guess, how do you manage the first six  
17 years straight? I'd love to hear it.

18 MR. CHAPMAN: All right. We have  
19 Ashley and Sue and Asa. And we're going to cut  
20 it off there. Sorry, I did totally skip over  
21 Emily. So it's actually Emily, Ashley, Sue, Asa,  
22 and then we're going to cut it off there.

1                   Sorry, Emily.

2                   MS. OAKLEY:    I think I remember from  
3                   the spring public testimony that you said that  
4                   the vast majority of Driscoll's production is in  
5                   the ground.  Is that correct?

6                   MR. JUSTUS:    Yes.

7                   MS. OAKLEY:    So I guess I'm just  
8                   confused as to why you're advocating so strongly  
9                   for containers because it's such a small  
10                  percentage of your production, and what the  
11                  benefit to the containers -- container production  
12                  is over the soil?

13                  MR. JUSTUS:    It's a great question  
14                  because I was on the research team trying to  
15                  solve the same problems.  And pretty much every  
16                  single one of our container growers is also a  
17                  organic soil grower for us as well.

18                  And really, I mean, for one, the  
19                  grower sees a great opportunity to save water.  
20                  There isn't a single example of an operation  
21                  we're not using at least 40 percent less water on  
22                  a per annual basis, which is pretty significant

1 for our area.

2 It also, particularly for blueberries,  
3 I mean blueberries prefer an extremely high  
4 organic matter soil system, and that's just not  
5 the natural system we have. And even, I mean,  
6 the numbers we're getting, you know, 1-2 percent.  
7 That's not, that's not a viable system for  
8 blueberries. You have to, the amount of  
9 amendments you're adding were way more than  
10 you're adding on a per acre basis. So growers  
11 saw it as a way to decrease total inputs applied  
12 as well. So we decreased the amount of fertility  
13 we used, we decreased the amount of water we  
14 used.

15 And we actually -- we actually  
16 improved productivity. And we're not ashamed of  
17 that. We're proud of that because we decreased  
18 input usage and increased output, the coir can be  
19 more sustainable and providing it just solved  
20 several challenges.

21 MR. CHAPMAN: Very quick.

22 MS. OAKLEY: Do you think some of

1 those challenges might be because you're growing  
2 blueberries in an environment that they don't  
3 naturally want to grow in? I'm in northeastern  
4 Oklahoma and we are in an area that is supposed  
5 to have native blueberries. But even there, it's  
6 really challenging to grow blueberries because we  
7 have a warm, hot summer much like California  
8 does.

9 Do you think that some of the  
10 challenge is the geographic location for where  
11 you're growing these crops?

12 MR. JUSTUS: Really it came down to  
13 the geographic challenges around when the fruit  
14 was going to get produced. We produce  
15 blueberries all over the world, in places where  
16 they would naturally grow and where they wouldn't  
17 naturally grow. But really it came from a demand  
18 for organic fruit in spring and fall, and you  
19 needed the climate of California.

20 So by putting it there we saved a ton  
21 of energy by instead of using some sort of  
22 greenhouse system to hit those fruit requirements

1 that the market was demanding. So that was  
2 actually a much better solution, we thought -- to  
3 go where the climate was naturally there so we  
4 didn't have to put all the excess energy in to  
5 produce the fruit.

6 MR. CHAPMAN: Thank you.

7 Ashley, Sue, Asa. Brief.

8 MS. SWAFFAR: Brief. Okay.

9 So you said a lot of your growers  
10 produce in ground and container on the same farm.  
11 So can you describe their material input lists,  
12 the differences between each of those systems?  
13 Is there a difference?

14 MR. JUSTUS: You're referring to  
15 organic soil and organic container?

16 MS. SWAFFAR: Yes.

17 MR. JUSTUS: Yes. So the input lists  
18 are going to be very similar. What you're going  
19 to find particularly in a blueberry field is a  
20 lot of soil amendments added previous to try and  
21 make the soil that's not really adapted, adapted.  
22 So they do like, you know, tons and tons and tons

1 of amendments. But fertility programs are very  
2 similar between the two.

3 And then the pest control is pretty  
4 much exactly the same.

5 So from the input list, actually the  
6 soil is going to have more, especially in the  
7 amendments of all the soil to try to make it  
8 suitable for production.

9 MR. CHAPMAN: Thank you.

10 Sue. Brief.

11 MS. BAIRD: Yes. My question was  
12 similar except that I -- do you do conventional  
13 grown and organic grown blueberries?

14 MR. JUSTUS: Yes. I advise on all  
15 systems.

16 MS. BAIRD: Okay. So what is the  
17 difference in the input in a conventional  
18 container-grown and an organic container-grown?

19 MR. JUSTUS: There wouldn't really be  
20 any overlap. On fertility, there would be no  
21 overlap. The convention people might use a  
22 couple organic pest control products, but they

1 would also use all the chemical options as well  
2 just because they can.

3 But fertility, there is no overlap on  
4 the sources they would use.

5 MS. BAIRD: I must not have made that  
6 clear. In conventional inputs describe the  
7 difference between a conventional and an organic  
8 input, I mean in fertilities. Do you use your  
9 ureas and whatever is in conventional? And then  
10 what do you use in organic? What's the  
11 differences?

12 MR. JUSTUS: Okay, sure. And really  
13 the difference is mainly centered around the  
14 nitrogen. And I really encourage the board to  
15 look at some fertilizer labels. It's a legal  
16 requirement called "guaranteed analysis" that you  
17 have to put what is in that fertilizer present.  
18 And you'll see basically by law they have to put  
19 percentage nitrate, percentage ammonia,  
20 percentage urea. And in the case of organic,  
21 they put soluble organic nitrogen and insoluble  
22 organic nitrogen.

1           If an organic fertilizer has nitrate  
2     in it, they are legally obliged that they have to  
3     put it on there. And that's what you don't find;  
4     the board doesn't allow those products onto a  
5     list. So what you see in organic is soluble  
6     organic nitrogen, insoluble organic nitrogen.  
7     And those are the options we have.

8           In conventional production, what  
9     you'll do is you'll basically target a level of  
10    ammonia or nitrate, depending on crop need, and  
11    that's what you'll target with. You won't add a  
12    protein, because that basically requires a  
13    microbial middleman to process, and you'll just  
14    do a low rate continual application.

15           MR. CHAPMAN: Asa. And, Dave, you  
16    have a question? Okay, but that's it. And  
17    brief.

18           Asa.

19           MR. BRADMAN: So I had a question  
20    about how the -- sorry -- how the materials are  
21    handled at the end of the cycle, containers; what  
22    happens to the root ball? Are they reused? And

1 also, what exactly is the root ball? And you  
2 mentioned peat, and is there compost in there as  
3 well? And so what happens to those materials?  
4 Are they taken off site, or what?

5 MR. JUSTUS: So that's really going to  
6 vary by grower, of course. I won't give you that  
7 ambiguous of an answer. But, you know, growers  
8 have their own perspectives in their own  
9 operations on what they're doing.

10 You know, most people are using a  
11 blend of coir, peat, perlite, something like  
12 that, and then some sort form of compost. You  
13 know, I've been following this proceeding very  
14 closely, and I advise all the growers, so we've  
15 already begun testing these things. But it's  
16 changing so quickly we're, like, well, what are  
17 we actually trying to do?

18 So we've been playing with all sorts  
19 of different composts, different forms and  
20 availabilities, you know, in terms of breakdown  
21 curves and things like that. Really, our  
22 challenge is going to be, like, how do we manage

1 it in years to come. And to be honest, we  
2 haven't turned over a blueberry planting yet  
3 because it's at least a 6-year cycle, and we just  
4 haven't been doing it that long.

5 In the case of raspberries it's a  
6 little bit shorter, 2.5 years maybe. And so what  
7 we do there is either it's incorporate right into  
8 the furrow, because it's all organic material so  
9 then it will just be incorporated into the soil  
10 on site. And then one of our larger growers has  
11 basically began a massive composting operation  
12 where they're doing compost and vermicompost.  
13 And those would go to that operation.

14 MR. BRADMAN: And then does that  
15 compost go back into the containers?

16 MR. JUSTUS: Yeah, the compost will go  
17 back in the container. Or they also have soil  
18 production, so they send it to both places. And  
19 they do a vermicompost extract liquid from that  
20 system as well. That's also applied to soil and  
21 the container system.

22 And so then we are looking, you know,

1 if we're going to have a compost requirement,  
2 what are the end requirements going to be is, you  
3 know, we want more control over that. The  
4 growers are probably going to likely produce  
5 their own compost to go into the starting mix.

6 MR. CHAPMAN: Thank you.

7 And Dave.

8 MR. MORTENSEN: Yes. Just thinking  
9 about blueberries in the east where I'm familiar  
10 with, and ericaceous plants, blueberries and that  
11 family are acid-loving plants. And this is back  
12 to Emily Oakley's question.

13 How do you get the pH down low enough,  
14 whether it's in a container or in the soil, so  
15 that the blueberries are healthy? I know in  
16 Pennsylvania, that would be a pH within the range  
17 or 4 to 5, 5 or so.

18 MR. JUSTUS: Yeah, the ideal --

19 MR. MORTENSEN: Very acidic.

20 MR. JUSTUS: Yeah. The ideal pH range  
21 for blueberries is 4.5 to 5.5.

22 MR. MORTENSEN: Okay.

1                   MR. JUSTUS: And that's basically  
2 their ideal range.

3                   MR. MORTENSEN: Yes.

4                   MR. JUSTUS: And they're ammonia-  
5 loving plants. They're iron-inefficient plants.  
6 So if you're not in that pH range, you run into  
7 issues very quickly.

8                   MR. MORTENSEN: Right.

9                   MR. JUSTUS: And so that was one of  
10 the reasons to go with containers is because peat  
11 moss has got a natural pH of 3.

12                   MR. MORTENSEN: Right.

13                   MR. JUSTUS: And so, basically we're  
14 going to start with a soil that's already down  
15 into the -- you know, that's just part of, you  
16 know, working your soil and how you're going to  
17 amend it. We're going to mix the soil to the  
18 ideal pH to start them off. That made a huge  
19 difference to the plant. It was just -- it was  
20 unmistakable.

21                   And so, and then we only use, of  
22 course, organically approved methods.

1 MR. MORTENSEN: Right.

2 MR. JUSTUS: With a big enough farm, a  
3 grower is going to have a sulfur burner. And  
4 then for smaller growers, a lot of them will use  
5 something like citric acid.

6 And then we also we get natural  
7 acidification from the microbial action in the  
8 root zone, especially from the ammonia uptake  
9 from the plant.

10 MR. MORTENSEN: So when you were  
11 saying that the soil-based blueberry growers use  
12 a lot of inputs, amendments and things in their  
13 soil, part of it is to actually manipulate the  
14 soil so that it resembles an acid environment in  
15 an otherwise non-acid environment. Is that true?

16 MR. JUSTUS: Yeah. So in soil,  
17 they'll also use a lot of elemental sulfur. A  
18 lot. You know, there's a standard curve where  
19 you get a holding capacity of soil of how much  
20 sulfur you put in there. And then they'll also  
21 do a lot of organic amendments.

22 So they were kind of making their own

1 container. They were just really the bed they  
2 were manipulating more. So a lot of elemental  
3 sulfur, a lot of organic matter, compost, pine  
4 bark, things like that. And then really the root  
5 zone stays in that area when you get the old  
6 plant out.

7 MR. MORTENSEN: Yeah.

8 MR. CHAPMAN: Okay, thank you very  
9 much. Thank you, Ian, for your time.

10 MS. JUSTUS: Thank you so much as  
11 well.

12 MR. CHAPMAN: Thank you to the Board  
13 for your questions.

14 We made it to the end. It's only  
15 7:20. Trick or treating is early. Just don't  
16 stay out too late, because we start tomorrow  
17 bright and early at 8:30.

18 So we're in recess till then. Thank  
19 you, everybody.

20 (Whereupon, the above-entitled matter  
21 went off the record at 7:22 p.m.)

22

<b>A</b>	
<b>A-dae</b> 1:15 9:5 192:10 196:11 400:18	141:6
<b>a.m</b> 1:9 5:2 103:12,13	<b>ACCREDIT</b> 39:13 50:14 55:7
<b>AAPFCO</b> 230:5	<b>accreditation</b> 26:16 32:18 39:9 52:16
<b>abandon</b> 285:13	53:10,20 55:8 56:3,7
<b>abide</b> 391:16	56:17,21 57:12 58:17
<b>ability</b> 129:11 287:2	58:20 59:7 62:5,6
<b>able</b> 28:11 39:7 90:22 115:22 126:1 137:16	78:13,16,18 157:16
137:17,20 157:22	164:1 393:2
159:7 160:4 162:16	<b>accredited</b> 55:14 62:3 62:10 290:2
165:11 171:10,10	<b>accredits</b> 26:21
180:2 184:19 185:1	<b>accumulating</b> 68:2
194:8 218:7 226:22	<b>accuracy</b> 369:3
227:1 308:10 321:7	<b>accurate</b> 36:10 121:17
322:13,18 342:15	<b>accurately</b> 58:11
344:17 353:7 364:12	<b>ACE</b> 43:14,16,17,20,21
367:18 442:15 459:10	44:2,9 45:14,17 46:5
460:18,20 472:3,5	46:7 49:3,4,7 109:18
<b>Abouleish</b> 286:19	111:11,21 112:7
<b>above-entitled</b> 103:11 206:7 329:15 501:20	113:16 114:3,10
<b>above-soil</b> 275:6	115:11,18 116:6
<b>abroad</b> 67:8 68:1	119:5,6,11 121:18
<b>absolutely</b> 36:2 87:7 144:20 165:6 179:12	122:2 124:1,14,16
179:16 190:20 191:6	126:10 127:14,15
351:8 448:2	131:19 132:7,8,10,13
<b>absorb</b> 387:3	132:13,19 133:3
<b>absorbing</b> 446:3	135:3,12 136:15
<b>abundance</b> 325:5	137:2 138:15,20
<b>abuse</b> 359:1	139:4,12 140:19
<b>ACA</b> 291:13 292:2	141:6,8 142:6 143:13
<b>academia</b> 334:19	153:13 154:7 159:9
<b>accelerated</b> 136:22	159:10 167:5,12,17
<b>accelerating</b> 461:10	169:14 171:16 172:6
<b>accept</b> 44:3 47:21 68:16 159:11 174:22	176:18 178:19 179:10
382:1	191:8,14 193:17
<b>acceptable</b> 98:3,3 398:7 477:21	194:7,21 195:6
<b>accepted</b> 42:11 45:22 46:17 51:4,7 63:13	196:14,15 204:18
278:16 295:9	<b>achieve</b> 272:1
<b>accepting</b> 278:2	<b>achieved</b> 175:10
<b>access</b> 25:9 38:17 46:4 110:11 135:3 143:12	<b>Achievement</b> 222:21
144:16 148:14 149:4	<b>acid</b> 21:15 211:9,17,19
176:17 181:3 332:2	213:13 221:2 227:22
343:14 351:17 355:18	228:5,11,21 230:9,13
373:12	230:15,21 231:1
<b>accessible</b> 243:20	368:9,14 472:11
<b>accessing</b> 351:14	500:5,14
<b>accommodate</b> 65:19	<b>acid-loving</b> 498:11
<b>accompany</b> 43:1	<b>acidic</b> 498:19
<b>accomplished</b> 199:9	<b>acidification</b> 500:7
<b>accounts</b> 135:3 138:15	<b>acidified</b> 21:12,13
	<b>acids</b> 74:15,15 228:3,7
	228:17,18 229:1,5,7
	229:12,15,22 230:11
	<b>acknowledge</b> 221:15 459:3
	<b>acknowledged</b> 282:1
	<b>acquire</b> 339:9
	<b>acquired</b> 316:22
	<b>acre</b> 177:17 490:10
	<b>acreage</b> 36:1,13 67:6 68:1,11,14 162:7
	<b>acreages</b> 321:11
	<b>acres</b> 177:16 241:17,18 241:19 245:5 250:20
	274:18 275:9 277:22
	278:7,12 280:17,18
	314:9 361:3 363:22
	364:15 395:5,6
	418:17,17
	<b>acronym</b> 40:1 43:14 47:6 88:2 90:14
	<b>acronyms</b> 42:16 109:14 168:4 178:21 183:7
	<b>ACS</b> 132:10,11,12
	<b>act</b> 26:12 32:12 63:13 97:9,12 116:16,19
	145:15,21,22 172:8
	173:7,9 175:11,12,14
	175:19 179:15 207:10
	215:9 302:15 345:1,5
	365:8 384:8 390:22
	443:13 463:16
	<b>acted</b> 85:11,21
	<b>acting</b> 15:17,21 16:6,22 17:1,10 87:12 89:12
	91:11 95:5,7,21
	<b>action</b> 28:17 29:13 54:4 55:10 56:2 202:10,12
	431:11 500:7
	<b>actions</b> 24:21 25:8,13 25:16,17,19 27:2,11
	28:18 29:8,21 33:3
	51:8,20 52:3 53:5
	54:2,6,15,17,20 55:4
	55:6 57:7 59:5 65:15
	67:10,10 73:20 159:2 197:14
	<b>active</b> 83:3 84:12 239:12,14,19 330:18
	332:18
	<b>actively</b> 153:11 239:9 458:10
	<b>activities</b> 39:15 57:13 57:17 58:11 102:2
	114:5 115:8 145:16
	165:8,15 369:2
	<b>activity</b> 84:21 229:3 243:19 429:4
	<b>actor</b> 453:1
	<b>actors</b> 26:20 28:13 198:5
	<b>acts</b> 233:4
	<b>actual</b> 110:2 167:16 262:9 266:1
	<b>adapt</b> 342:15
	<b>adapted</b> 492:21,21
	<b>add</b> 22:1 37:20 45:16 83:17 130:1 152:20
	169:1 170:2,4,5
	205:14 211:2 232:10
	258:14 267:10,11
	311:3,6,7,13 341:3
	345:10 424:6 495:11
	<b>added</b> 79:3 180:14 228:13 236:2 257:10
	279:7 397:20 402:10
	424:10 492:20
	<b>addenda</b> 37:20
	<b>adding</b> 131:1 267:10 355:1 490:9,10
	<b>addition</b> 25:17 44:4 79:4 137:6 170:13
	208:21 209:3,8 219:3
	221:5 364:21
	<b>additional</b> 25:19 46:5 55:7 67:20 71:9
	104:11 128:16 130:2
	135:17 139:7 143:13
	208:4,9 218:8 221:12
	230:10 295:6 386:12
	454:4 459:5
	<b>Additionally</b> 150:21 154:8 155:1 180:16
	229:12 390:19
	<b>additions</b> 86:20
	<b>address</b> 21:9 38:5 56:22 58:19 186:22
	250:5 253:21 256:2
	269:3 286:15 288:5
	290:20 343:15 348:5
	348:8 349:8 357:22
	390:4 429:8,11
	479:22 484:4
	<b>addressed</b> 236:11 240:4
	<b>addresses</b> 345:5
	<b>addressing</b> 108:5 432:7
	<b>adds</b> 253:2
	<b>adequate</b> 343:12
	<b>adhere</b> 275:17
	<b>adhering</b> 315:13
	<b>Adjourn</b> 4:20
	<b>adjust</b> 249:4 444:2
	<b>adjusted</b> 107:14
	<b>adjusting</b> 478:3
	<b>adjustment</b> 476:8
	<b>administering</b> 145:14
	<b>administration</b> 20:16 21:22 83:14 84:4,8
	93:4 105:15 133:8
	134:14,18 354:22
	355:10

**administrations** 94:22  
**administrative** 33:13  
**administratively**  
 151:11  
**administrator** 2:6 5:9  
 8:3 13:6 16:7 17:1,3  
 17:10,14,16,20 51:16  
 87:13,18,22 89:13  
 91:11 95:6,8,21 107:2  
 179:18,19  
**Administrator's** 91:8  
**admissibility** 134:7  
**adopted** 281:18 348:20  
 429:6  
**Adoption** 36:8  
**adult** 390:13  
**advance** 6:12 59:6  
 162:20 168:5 226:10  
 461:3  
**advanced** 165:8  
**advancements** 25:2  
**advances** 444:13  
 460:22  
**advancing** 31:15  
**advantage** 98:14  
 257:13 442:3 481:20  
**advantages** 111:4  
**adversarial** 130:13  
**advice** 97:19,20 166:15  
 227:2 475:16  
**advise** 439:7 493:14  
 496:14  
**advised** 341:12  
**advises** 146:19  
**advising** 431:12  
**advisory** 2:2 18:22 97:8  
 140:8 251:13 427:11  
**advocate** 86:8 95:12  
 268:17  
**advocated** 85:17  
**advocating** 489:8  
**aerobic** 465:20  
**aerobics** 381:5  
**Affairs** 19:8  
**affect** 479:16  
**affiliation** 225:21 226:6  
 227:13 231:11 241:14  
 251:8 255:19 264:3  
 268:7 273:21 289:20  
 308:20 313:10 322:4  
 325:18 330:3 334:8  
 339:13 347:20 354:13  
 363:15 368:2 374:11  
 377:15 382:6 389:4  
 392:6 396:8 401:7  
 409:8 416:15 420:12  
 427:8 441:9 449:2  
 458:7 474:11

**affiliations** 99:2 225:22  
 235:9  
**affirmation** 293:21  
 294:4  
**afford** 128:16  
**affordable** 351:18  
**aflatoxin** 186:5  
**afraid** 449:22  
**Africa** 117:22  
**afternoon** 8:8 206:16  
 235:10 289:21 348:19  
 368:3 392:7 396:10  
 445:3  
**ag** 11:5 152:20 153:4  
 232:8,19 239:5  
 464:14,16 473:1  
**Ag's** 427:11  
**age** 418:2  
**agencies** 8:7 28:4,11  
 31:7 83:8,14 88:15  
 90:20 103:18 106:1  
 110:15 111:5 112:16  
 113:5 114:7 115:21  
 123:21 131:18,22  
 132:15,16 133:5,17  
 134:6,20 135:2,20  
 136:8,20 137:7,19,22  
 138:8,12 139:3,5  
 142:1,6 143:15 167:3  
 167:14,22 168:9  
 171:5 172:1 460:4  
**agency** 16:11 44:15  
 45:6 47:5 91:5,7  
 110:17 113:3,12  
 133:14 134:10 135:8  
 135:22 136:2,6,11  
 137:14,16 138:18  
 139:18 141:5,13,17  
 142:10 145:11 148:4  
 171:9,12,14 176:3,17  
 183:3 186:7 200:19  
**agency's** 136:4 137:11  
 138:20  
**agenda** 4:3 7:19 8:18  
 22:2 79:18 80:15,18  
 81:4 91:19 92:15  
 95:22 102:10 104:2  
 104:13 206:11,19,20  
 206:22 212:7 214:11  
 216:17 239:11,20  
 241:1 416:11  
**ago** 268:20 314:2  
 315:17 323:9 330:10  
 364:7 366:6 375:11  
 390:1,8 417:1 419:2  
 453:3 458:16  
**agree** 61:19 93:3 96:13  
 238:5 249:14 251:22

253:10 276:10 292:5  
 292:20 293:19 302:11  
 305:1 326:16 328:15  
 331:4,9 332:16 465:8  
 468:20 469:5,7,8,10  
 469:12  
**agreed** 345:15 391:16  
 391:16 488:8  
**agreement** 2:18 62:4,7  
 105:10,14 108:11  
 116:12,16 220:10  
 275:6 277:10,11  
 281:4,8,13 282:1  
**agreements** 25:10 33:1  
 41:4,16 42:20 43:7  
 50:11 51:4 114:11  
 159:12,17 174:15  
**agrees** 224:4 301:22  
 368:13  
**agricultural** 2:19 5:11  
 13:10 16:12 92:9 94:7  
 104:4 105:9 107:2  
 108:2,15 109:2 110:8  
 110:10 111:3,18  
 113:21 116:16 131:17  
 134:9 204:20 212:21  
 213:2,16 214:22  
 223:3 264:6 368:11  
 368:15 369:5 375:9  
 390:9 410:7 442:1  
 444:11 463:9  
**agriculture** 1:1 74:17  
 95:3 112:18 114:8  
 145:13,18 150:16  
 151:12,17 169:4,13  
 258:7 269:11,16  
 272:18 273:1 277:3  
 283:4,15 284:20,21  
 285:2,11,17 287:22  
 299:22 330:15 333:12  
 333:14 338:8 340:13  
 345:2 349:13 375:6  
 375:14 382:19 389:8  
 403:5 422:2 429:1  
 435:17 445:15  
**Agro-Ecology** 10:3  
**agroinfiltration** 435:4  
**agronomic** 474:21  
**agronomics** 285:4  
**agronomist** 419:1  
**ahead** 14:15 39:14  
 51:18 52:1 74:19,22  
 82:13 83:1,6 90:4  
 156:13,18 168:15  
 174:22 202:20 328:22  
 346:19 363:20 425:8  
 468:5  
**AIA** 57:11

**aids** 59:8 208:10  
**aim** 286:2  
**aiming** 184:19  
**air** 119:16,17 153:7  
 284:8,11 452:10  
 482:20  
**Alan** 3:4 396:7 401:5,6  
 401:8 403:21 405:14  
 409:2  
**Albert** 406:16 453:12  
**alcohols** 208:17  
**Aldo** 341:11  
**alert** 61:14 65:2  
**alfalfa** 423:5 424:3  
 425:16 426:1  
**algae** 213:19 355:2  
**align** 53:5 207:21  
 292:21  
**aligned** 208:2  
**aligns** 368:16 433:19  
**alive** 327:17 417:9  
**alkaline** 228:8 230:22  
**alleged** 74:1  
**Allen** 2:9 458:11,22  
**Alliance** 2:9 254:2  
 295:13 298:9  
**Alliance's** 297:21  
**Allison** 379:22  
**allocated** 140:1  
**allow** 68:10 95:13  
 127:20 138:8 149:13  
 159:9 160:13,18  
 172:20,21 261:10  
 274:14 275:3 277:14  
 282:12 287:9,19  
 288:15 290:22 300:15  
 304:11 321:15 376:13  
 391:4 398:1 439:9  
 442:8 444:2 455:10  
 459:3 462:2 495:4  
**allowable** 370:14  
**allowed** 101:3 109:10  
 193:4 226:13 230:4,9  
 230:18 275:11,15  
 282:9 287:10 292:7  
 321:5 356:16 370:8  
 371:19 437:18  
**allowing** 354:4 376:17  
 382:13 409:12 443:19  
**allows** 23:13 34:15 44:2  
 46:7 258:20 280:20  
 303:3,7 351:16  
 437:20 460:19  
**alluded** 134:5  
**allyl** 210:6,13  
**alternative** 94:6 207:13  
 207:13 399:9,17  
 460:17

**alternatives** 20:11  
207:12 233:7 254:10  
358:19 399:3,19  
**altogether** 315:5  
**amazed** 413:2  
**amazing** 96:16 153:2  
153:10 323:6  
**ambiguous** 496:7  
**amend** 215:4 455:2  
499:17  
**amending** 82:13  
**amendment** 451:10  
**amendments** 265:3  
336:7 451:4 490:9  
492:20 493:1,7  
500:12,21  
**America** 117:22 281:6  
317:2 361:4  
**American** 52:8 119:3,4  
128:19 129:1 130:4  
230:6 280:15 439:11  
**amiss** 135:21  
**ammonia** 266:11  
494:19 495:10 500:8  
**ammonia-** 499:4  
**ammonium** 209:10  
210:8,8,14  
**amount** 19:5 115:10  
153:2,10 161:8,12  
173:21 198:16 224:13  
228:9 229:14 237:13  
263:13 265:5 267:9  
383:20 439:9 490:8  
490:12,13  
**amounts** 14:11 57:18  
228:19  
**Amri** 312:6,10  
**AMS** 16:6,13 17:16,19  
19:8 22:1 25:3 27:11  
29:3 41:2,17,20 42:9  
42:11,14 44:22 45:1,5  
45:6,13,16,22 46:4,10  
46:17 48:13,14,20  
49:6,15,21 50:2,9,11  
50:16,20 51:6,10 52:1  
63:13,13 93:12 95:6  
109:11 113:3,11  
114:6,7,9,22 120:3  
121:12 122:8 123:13  
125:17 126:1 136:7  
145:3,7 155:14  
156:14 158:3 163:4  
163:17 167:7 182:15  
182:16 183:1  
**AMS's** 40:5 41:6  
**AMS'NOP** 104:10,16  
**Amy's** 379:21  
**anaerobic** 208:19

**Anais** 2:10 295:11  
300:22 301:2 323:14  
**Anais'** 312:16  
**analogous** 452:15  
**analogy** 331:8  
**analyses** 360:12  
**analysis** 24:2 63:17  
106:11 149:12 189:11  
239:10 297:21 494:16  
**analyst** 72:12 334:10  
433:12  
**analyzed** 136:13  
**analyzing** 266:2  
**anatomy** 393:22  
**ancient** 229:19  
**ancillary** 213:22  
**and/or** 171:12 263:14  
424:21  
**anecdotal** 466:1  
**anecdotally** 379:1  
**Angela** 3:13 458:3  
462:16 463:6  
**Angeles** 122:20  
**animal** 10:15 28:5  
106:7 113:12 143:22  
144:3 145:4,10,15,20  
145:21 146:2,5,13  
153:15 155:10 335:6  
408:8 435:17 466:22  
**animals** 76:10 211:18  
234:12 299:8 300:16  
336:2 375:13 383:22  
421:9  
**Ann** 2:9 289:18 295:10  
295:12 297:19 298:14  
300:19  
**annotation** 230:10  
231:3 355:12 358:6  
358:11 369:9,11  
428:14  
**announced** 82:4 88:10  
**announcement** 70:18  
88:12,16 325:17  
**announcements** 102:1  
**announcing** 70:8 77:9  
**annual** 53:15 56:13  
76:5 236:5 291:22  
294:2 479:15 489:22  
**annually** 303:16 443:3  
**ANSI** 4:9 8:2 14:3 52:5  
52:7,9,19 53:16,20  
54:1,19 57:4 58:3  
59:2,5,12  
**ANSI's** 56:15  
**answer** 36:15 66:9  
72:11 107:12 175:1  
220:14 306:15 307:20  
312:15 324:11 346:6

349:13 381:15 464:7  
496:7  
**answered** 23:8,13  
192:12 346:3 420:22  
457:19  
**answering** 288:20  
455:13  
**answers** 192:2 195:9  
223:11 269:9 315:21  
363:1 464:12  
**anthropocene** 452:22  
**anthropogenic** 452:21  
**anti-** 350:2  
**antibiotic** 435:22  
**antibiotics** 435:14,17  
435:19 439:19 440:5  
440:12,18  
**anticipate** 70:17 424:20  
**anticipating** 469:17  
**antimicrobial** 212:9  
**antioxidant** 382:22  
387:1  
**antiquated** 350:2  
**antsy** 201:13  
**anybody** 189:15 394:6  
**anymore** 320:7 335:20  
340:22 462:13 485:2  
485:6  
**anytime** 344:10  
**anyway** 388:21 422:9  
**Apart** 185:19  
**APHIS** 28:6 47:7,12,14  
47:14 48:13,21 49:7  
49:21 50:2 138:9  
144:15,18 145:3,9,20  
146:4,12,21 147:13  
148:3 149:6 151:11  
152:3 153:14 154:16  
156:14 180:4,12  
181:10 182:5 190:21  
195:16,16 196:20  
201:16  
**APHIS's** 153:3 154:17  
154:21  
**APHIS/Plant** 2:19  
**APIs** 69:22  
**Apollo** 283:8  
**apologize** 168:4 226:9  
**app** 161:7  
**apparently** 365:15  
**appeal** 25:9  
**appealing** 210:17  
**appeals** 25:15  
**appearance** 98:15  
458:18  
**appeared** 355:6  
**appears** 292:22  
**applause** 6:3,4,11,13

6:19 7:7 14:18,19  
19:3 59:19 78:2  
328:12  
**apple** 272:4  
**apples** 260:16 415:11  
**applicable** 69:1 124:10  
215:5 303:11 460:3  
**applicants** 57:9  
**application** 56:17 58:2  
69:22 70:15 89:3  
233:22 495:14  
**applications** 89:6 90:21  
91:6 208:9 227:21  
228:22 233:20 260:5  
314:14  
**applied** 117:5 252:17  
258:9 294:12 297:9  
417:12,22 490:11  
497:20  
**applies** 213:2 294:13  
372:14 374:1  
**apply** 180:18 234:3  
246:7 290:13 291:10  
294:15 374:5 412:14  
413:14,21  
**applying** 88:20 234:12  
234:17 372:19 477:4  
479:18  
**appointed** 97:10  
**appointees** 169:3,6  
**appointment** 17:3  
87:10  
**appoints** 90:7,9  
**appreciate** 96:6 109:14  
157:5 166:6 244:6  
251:19 339:15 350:16  
433:7 441:6 474:15  
**appreciated** 294:9  
334:16  
**appreciates** 398:5  
**apprised** 140:18  
**approach** 58:3 62:21  
110:13 149:16 253:9  
290:14,17 349:12  
384:20 466:7  
**approaches** 65:13  
72:18 353:15  
**approaching** 164:12  
**appropriate** 93:14  
270:19 349:6 477:17  
**approval** 41:3 148:14  
150:13 391:5  
**approve** 12:14 160:13  
161:9 240:22 241:6  
345:22  
**approved** 12:17 181:4  
219:6 221:6 232:19  
241:3 260:2 299:6

336:11 346:10 499:22  
**approves** 43:3 241:6  
**approving** 399:10  
**approximately** 24:19  
 118:4 275:9 397:5  
**April** 12:8 92:13 94:20  
 95:2 412:11  
**aquaganics** 307:2  
**aquaponic** 274:15  
 466:3  
**aquaponics** 259:13  
 463:12 464:4,18  
 467:3,4,14 469:7,19  
 470:4  
**aquatic** 236:7  
**arable** 287:3  
**arbitrary** 237:19  
**area** 16:14 63:5 107:7  
 109:11 118:8 144:5  
 145:12 150:8 158:10  
 160:7 162:20 164:21  
 185:15 188:3 200:6  
 260:12,20 261:14,17  
 265:4 293:3 380:10  
 387:12 390:10 485:14  
 490:1 491:4 501:5  
**areas** 21:20 29:11 46:5  
 93:2 139:6 162:19  
 298:19 314:6 351:16  
 394:14 408:16 433:16  
**arena** 190:5  
**Arguably** 482:15  
**argue** 190:13 193:6  
 285:1,16 286:18  
 350:5,7 351:11 419:2  
 485:21  
**argued** 349:22  
**argument** 473:16  
**arguments** 342:18  
 488:4  
**Arkansas** 10:12  
**army** 391:18  
**arrange** 179:20  
**arranges** 125:7  
**arrival** 152:8  
**arrives** 47:11  
**arriving** 122:19  
**Arsenault** 2:2 19:1  
**art** 249:3,3  
**arthropods** 483:3  
**article** 77:1  
**articles** 74:9  
**articulate** 97:10  
**artificial** 279:9 377:6  
 434:4,8,13  
**Asa** 1:14 9:13,20  
 192:10 233:16,18  
 259:16 305:19 326:19

326:20 425:12 451:14  
 455:18 457:18 488:19  
 488:21 492:7 495:15  
 495:18  
**ashamed** 490:16  
**Ashley** 1:12 10:11  
 81:16 240:20 244:9  
 282:5 337:13 338:20  
 357:22 360:7 363:5  
 406:16 411:22 419:12  
 422:11 440:21 488:19  
 488:21 492:7  
**Ashley's** 446:19  
**asked** 22:1 31:11 94:20  
 101:10 125:22 148:22  
 241:8 277:2 307:7  
 389:22 420:17 436:17  
 436:20 464:6,10  
 465:15  
**asking** 127:2 155:19  
 188:18 225:19 226:5  
 315:21 357:13 379:13  
 425:4,14 446:19  
 469:3  
**aspect** 138:18 165:10  
 324:6 361:20  
**aspects** 108:20 360:17  
 474:21  
**asphalt** 455:7 456:2,9  
**aspirations** 94:9,11  
**assemble** 453:14  
**assert** 229:3  
**assertion** 229:12  
**assess** 36:18 165:17  
 204:3 368:22 373:19  
**assessed** 370:16  
**assessment** 34:10  
 40:21 46:18,22 64:19  
 79:15 114:18 115:11  
**assessments** 54:10  
 56:8,10 64:11 204:14  
 204:21 296:13  
**assign** 144:11  
**assigned** 220:22  
**assigning** 187:15  
**assist** 180:12  
**assistant** 106:9  
**assisted** 435:6  
**associate** 2:6 5:9 8:2  
 13:5 17:19 51:16  
 107:1  
**associated** 88:6 98:10  
 162:5 434:15  
**Association** 2:20 3:12  
 199:5 227:16 230:6  
 282:20 290:3 348:2  
 427:13 469:20  
**associations** 378:13

**assume** 87:6 113:2  
 175:13,17 399:18  
 410:20  
**assuming** 248:2,8  
 337:22 479:4  
**assured** 129:1 462:9  
**assures** 451:21  
**astounding** 461:6  
**Athens** 2:15 420:14  
**atmosphere** 283:20  
 284:10  
**atrazine** 417:12,21  
**attached** 202:14 270:7  
 429:22  
**attack** 352:5  
**attacks** 226:15  
**attaining** 463:11  
**attempt** 107:21 121:14  
**attendance** 382:11  
**attendees** 15:8  
**attention** 63:21 139:7  
 192:4 228:18 247:16  
 250:14 273:7 339:21  
 344:4 389:20 418:7  
 439:7 477:12  
**attitudes** 289:1  
**attorneys** 177:7 345:21  
 345:22 346:2 391:18  
**attractive** 351:12 354:8  
**attribute** 23:21 94:16  
**attributed** 261:21  
**attributes** 403:4  
**audible** 12:11,15 100:8  
**audience** 102:13  
 107:18 148:17  
**audit** 8:2 30:7 40:4,17  
 41:2 51:15,17,20  
 53:21 54:7 59:12  
 65:10 66:4 159:3  
 160:6,19 165:15  
 167:10 172:17  
**audited** 303:16  
**auditing** 26:15 165:8  
 442:21  
**auditor's** 78:13  
**auditors** 52:12 53:13  
 57:22 58:13 59:9 76:8  
 79:5 463:19  
**audits** 27:4,21 31:4,5  
 40:6,8,11,15,16,19,20  
 41:1,15 50:8,10,12,16  
 50:22 51:3 54:10,21  
 56:4 57:9,14,15,15,16  
 62:18 63:2,3 64:6  
 65:12 79:8,9 164:2,3  
 164:6,9 165:9 197:21  
 198:17 199:1  
**August** 29:7 103:22

104:13 223:1 235:19  
**Australians** 154:4  
**authentic** 135:15  
 161:16  
**authenticity** 38:7  
**authorities** 44:16  
 137:11 138:7 159:18  
 175:4 281:3  
**authority** 43:11 44:18  
 45:11 123:14,16,17  
 129:8,9,12 137:12,17  
 138:4 139:19 159:20  
 163:14 172:2,5,11,13  
 172:15,19,22 173:1,6  
 176:10,19 177:2  
 185:16 186:2,3,5,8,16  
 190:1 196:9 205:3,4  
 239:16  
**authorization** 110:6  
**authorized** 151:11  
**authorizes** 116:17  
**authors** 219:21 220:4  
 220:11,19  
**authorship** 220:3  
**automated** 43:15 110:2  
 123:2 124:22 132:6  
 132:10 135:7,10  
 180:22 183:1  
**automatic** 122:16  
 143:17  
**automatically** 121:6  
 122:7 124:19 125:3,9  
 125:13  
**automation** 190:3,14  
**availabilities** 496:20  
**availability** 154:2 161:7  
 229:2  
**available** 20:12 29:15  
 37:12 38:11 40:4 70:2  
 102:21 130:14 135:12  
 148:18 152:17 156:1  
 156:3 209:11,20,22  
 211:13 212:1,17  
 214:5,13 217:5  
 229:14 230:16,21  
 236:18,20 237:8  
 252:5 256:15 261:13  
 290:15 297:14 325:3  
 340:22 347:8 371:15  
 387:11 397:14 403:9  
 460:21 469:13 472:4  
 472:6  
**avenue** 416:21  
**average** 113:5 127:12  
 127:13,15 486:10  
**avid** 441:17  
**avoiding** 434:8  
**award** 219:14 221:16

221:17,19,20,21  
222:2,18 224:2  
**awarded** 219:15  
**aware** 37:7 83:10,19  
85:18 95:6 179:7  
203:5 234:8 286:8  
359:10  
**awareness** 107:22  
202:18  
**awful** 64:20 156:18

---

**B**

---

**B** 1:8  
**B1** 293:8 400:1,4,9  
**back** 12:17 19:9 27:4  
49:3 60:7 61:5 65:1  
86:19 92:5 93:9 94:20  
103:8,17 116:6  
117:14 119:14 123:2  
123:5 125:10,13  
135:16 143:9 155:13  
160:21 164:10 166:8  
171:13 176:7 189:22  
196:22 201:10 206:3  
206:5,11 215:12  
253:20 256:19 286:1  
297:5 323:19 329:10  
334:17 339:19 341:12  
359:22 390:6 392:17  
392:21 426:7 462:8  
464:9 477:9 497:15  
497:17 498:11  
**background** 47:2 48:11  
104:5 105:2 132:13  
165:4 166:14 407:17  
**backtrack** 406:6  
**backyard** 327:18 467:5  
**bacteria** 472:7  
**bacterial** 316:19 318:8  
**bad** 28:12 429:16  
452:18  
**bags** 232:13,13,13  
**Baird** 1:13 11:8,8 248:1  
248:7,12,15 249:14  
249:17 286:6,10  
373:22 405:13 406:14  
413:2,10,17,22  
414:19 439:17 440:2  
440:4,7,19 451:15  
471:6,9 493:11,16  
494:5  
**balance** 27:4 79:8  
94:10 165:9 197:20  
198:22 216:15 479:17  
**balanced** 253:9 348:9  
**ball** 32:15 495:22 496:1  
**Ballrooms** 1:8  
**Bandelet** 432:9

**bands** 267:21  
**banks** 127:22  
**Bar** 10:19  
**Barber** 379:22  
**Bardi's** 347:3  
**bark** 501:4  
**Barn** 380:1  
**barrels** 333:14  
**Barrett** 2:9 448:22  
458:8,10 462:1,18  
**Bart** 364:12 367:3,17  
**base** 242:7 246:22  
247:8,9 249:11  
301:13 348:22 447:6  
**based** 21:6 32:19 33:10  
33:11,15 60:8 65:13  
97:20 133:15,16  
139:18,20 150:3  
167:9 183:12 237:17  
243:10 254:5 262:11  
262:13,14 301:8  
316:6 333:12 340:1  
346:16 370:11 376:9  
387:8 402:10 444:3  
477:4  
**baseline** 46:22 158:18  
465:1  
**basic** 301:15 319:3  
331:22 332:6,14  
336:9 342:8 366:9  
**basically** 119:12 121:7  
124:7 146:19 192:13  
235:2 246:12 284:13  
300:5 321:14 393:15  
417:2 456:3 480:6  
481:6 486:15,22  
494:18 495:9,12  
497:11 499:1,13  
**basing** 207:16  
**basis** 68:14 118:21,22  
123:3 124:22 128:17  
141:14 236:5 254:2,4  
269:7 331:21 489:22  
490:10  
**batch** 38:1  
**baths** 211:22  
**battery** 472:11  
**Baumgartner** 2:9  
289:18 295:11,12,13  
298:4 299:13 300:20  
**bay** 258:5,6,8,10 260:12  
261:17 262:3  
**BCQI** 464:16  
**bean** 265:20  
**bear** 462:20  
**becoming** 70:14 356:19  
362:9 459:12 461:2  
**bed** 393:20 456:4 501:1

**Beddard** 2:10,10  
295:11 300:22 301:2  
301:2 304:19 305:8  
306:19 307:11 308:8  
322:3 325:19,19  
328:18  
**bedrock** 275:20 284:13  
449:8  
**beds** 275:10 282:13  
423:21  
**beef** 402:6 473:3  
**beer** 103:5  
**bees** 211:21  
**began** 110:5 137:3  
432:15 497:11  
**beginning** 104:19 105:3  
142:17 173:2 175:3  
223:19 267:9 338:7  
349:14 352:16 383:5  
383:7 392:11 427:21  
430:22 488:7  
**begun** 496:15  
**behalf** 13:10 98:4 134:4  
134:10 135:8 137:20  
138:14 153:3 239:6  
274:2 348:1 364:19  
**Behar** 1:14 11:13,13  
60:5 61:6,21 78:7  
79:16 86:16 178:17  
181:2 199:4 200:3,15  
234:5 246:1 262:7,13  
262:22 271:14 277:21  
285:7 298:14 305:6  
320:16 324:19 325:2  
338:7 344:22 345:4  
359:10 367:2 369:21  
370:1,20 398:21  
436:11 483:13 484:9  
**behaving** 266:4  
**behooves** 271:11  
**belabor** 153:13  
**belief** 459:1  
**beliefs** 459:7 461:5  
**believe** 70:20 102:20  
125:1 145:6 151:18  
165:22 173:8 175:9  
175:15 180:17 183:20  
187:5 195:17 198:20  
212:16 220:22 243:16  
264:14 312:19 313:1  
329:3,4 338:15  
348:15 364:15 370:22  
378:4 379:12 381:19  
383:14 385:2 395:20  
417:6 418:19 422:1  
433:20 442:11 446:3  
450:17 468:21 470:2  
478:1

**believes** 452:2  
**belongs** 113:8  
**beneath** 253:3 304:7  
**beneficial** 447:10,20  
448:7 452:11  
**beneficials** 250:14,21  
**benefit** 38:2,8 98:6  
130:3 233:11 327:9  
387:5 421:17 489:11  
**benefits** 23:10 32:2  
98:10 142:1,11 271:6  
312:20 333:9 372:19  
**benzene** 212:15  
**Berkebile** 2:11 293:14  
392:5 396:6,10,11  
399:11 400:5,12  
401:1  
**Berkeley** 9:14  
**berries** 310:20 403:8  
405:4  
**berry** 474:8,22 475:14  
**Besancon** 2:12 377:16  
377:18 379:20 380:13  
381:8,11,14  
**Bessencon** 374:10  
**best** 29:20 30:14 140:4  
141:20 163:16 172:3  
201:16 202:2 265:10  
291:14 292:2 293:10  
386:10 422:4 449:16  
**Betsy** 73:9  
**better** 23:11,14 35:17  
36:9 51:19 52:2 55:6  
67:11 93:15 103:4  
146:16 216:14 247:18  
247:18 257:22 309:11  
311:15 312:9,9 339:2  
340:3 411:17,19  
433:20 454:11 492:2  
**beyond** 93:17 271:10  
271:11 335:13  
**Biannual** 12:8  
**BIEC** 112:3,14 140:11  
**Biernbaum** 488:2,12  
**big** 40:1 59:11,21 63:18  
65:8 154:14 169:10  
169:14 180:6 221:16  
241:19 250:9 269:20  
275:8 299:10 305:9  
312:21 318:5 355:1  
355:13 360:12 392:18  
452:22 459:20 467:11  
467:13 481:19 485:7  
486:6 500:2  
**bigger** 473:15  
**biggest** 153:9 327:6  
449:17  
**Bill** 34:3 39:8

**billion** 188:17 343:9,10  
343:11,20 452:16  
453:3  
**binder** 12:10  
**bins** 232:5  
**Bio** 146:5  
**bio-** 349:9  
**bio-compost** 451:17  
**biobased** 216:9  
**biodegradable** 216:8  
**biodiverse** 408:9  
**biodiversity** 236:13  
247:4 254:13,17  
255:1,3,10 270:22  
271:18,22 273:9  
295:15,16 299:5  
301:17 308:13 408:6  
429:3 483:9  
**biodynamic** 283:4  
285:17 286:11,13,14  
286:17,20,22 288:10  
288:17,18  
**biodynamically** 321:17  
**biological** 243:13,19  
250:13 429:3,4  
452:17  
**biologically** 330:18  
332:18  
**biology** 106:18 243:15  
245:13,21 252:16,19  
311:2 349:19 393:14  
452:4,8 454:20  
**bioponic** 311:1  
**bioreaction** 467:10  
**bioreactor** 471:17  
**biosphere** 283:20  
284:12  
**biotechnology** 196:14  
**biotic** 341:15  
**bison** 402:6  
**bisphenol** 214:5  
**bit** 13:16 31:17 70:11  
81:18 87:16 101:12  
107:21 108:14,22  
110:3 118:9,16 119:7  
170:5 184:9 192:5  
220:6 244:11 249:9  
250:8 254:22 265:14  
269:13 305:12 317:14  
329:8 351:2 364:5  
404:2,9 406:18  
423:12 424:5 445:17  
451:1 468:2 497:6  
**bituminous** 229:17  
**blanket** 220:10  
**blanketed** 461:7  
**blemish-free** 404:21  
408:20

**blend** 312:22 400:4  
496:11  
**blended** 228:20  
**blew** 417:17  
**blind** 394:1  
**block** 310:11  
**Blockchain** 160:12  
161:1,11 164:15  
165:1,2  
**Blockchains** 161:15  
**Blom** 2:12 268:6 273:20  
273:22,22 277:8  
278:5 279:4 280:11  
281:2,21 282:10,15  
**blood** 411:9 424:4  
426:2,6  
**blue** 3:10 112:19  
270:16 283:9 380:1  
427:9  
**blueberries** 321:12  
447:4,16,17 490:2,3,8  
491:2,5,6,15 493:13  
498:9,10,15,21  
**blueberry** 479:13,13,17  
480:2,21 483:1,14  
492:19 497:2 500:11  
**blunt** 93:17,22  
**board's** 22:2 216:11  
476:9  
**boards** 376:16 476:17  
**bodies** 140:7 143:15  
402:14  
**boggling** 360:22  
**boils** 480:11  
**bold** 357:12  
**bona** 350:4 429:17  
**bone** 434:15  
**book** 347:4  
**books** 409:22  
**boots** 189:13 190:2  
191:19 196:3 197:18  
405:1  
**border** 2:14 28:6 31:22  
43:9,10,11 44:20,21  
105:20 106:13 110:5  
112:2 114:2 118:2  
119:19 121:5 129:17  
137:17 138:5 140:9  
140:11 147:1,5  
150:15 155:12 168:1  
196:9,10  
**borders** 198:9,10  
**born** 283:7  
**borrow** 381:17  
**Boston** 389:6  
**bottom** 267:16  
**bought** 177:21  
**boundaries** 272:7

**bovines** 234:7  
**box** 75:19 112:19  
146:22 147:1,20  
183:18 222:12  
**boxes** 118:12  
**boy** 21:12  
**BPA** 214:5  
**Bradman** 1:14 9:13,13  
192:11 233:19 259:17  
305:20 306:3,21  
308:6 424:11,15  
425:13 426:10,16  
427:3 455:19 466:16  
466:21 467:20 468:15  
469:21 495:19 497:14  
**brain** 362:2  
**bran** 423:5,6  
**branch** 3:8 28:1 389:6  
**brand** 373:4 378:12,14  
378:17,18,20 379:3,5  
379:15 380:9 411:6  
421:12  
**brands** 377:19,19  
378:13  
**Brazil** 149:18  
**break** 92:1 100:22  
103:7 177:14 215:12  
325:12 487:2  
**breakdown** 146:4  
496:20  
**breakdownable** 486:16  
**breaking** 23:17  
**breaks** 488:9  
**Brewery** 103:3  
**bridge** 179:16  
**brief** 7:19 8:4 91:20  
92:2 164:14 192:11  
325:12 492:7,8  
493:10 495:17  
**briefly** 7:18 136:16  
196:12 397:16 472:16  
**bright** 501:17  
**Brines** 2:3 18:19 206:14  
206:15 220:20 221:7  
221:15 222:22  
**Brines'** 224:3  
**bring** 62:10,15 94:17  
104:22 146:20 151:21  
155:13 194:17 232:2  
262:21 269:12,17  
273:6 328:6 339:21  
367:8 369:2 423:3  
425:17 462:8  
**bringing** 60:20 124:15  
155:17 201:9 208:14  
466:17  
**brings** 276:1  
**Briones** 1:15 9:5,5,8

196:12 400:19  
**British** 283:16  
**broad** 115:13 145:11  
173:12 247:6 454:6  
**broader** 106:21 130:20  
131:15 185:4 247:3  
**broadly** 477:18  
**broker** 118:13 120:6  
122:11 135:16 152:1  
152:1 187:15 195:6,8  
202:17,19  
**brokers** 122:6 130:9  
132:17 194:2 195:3  
**brocade** 151:15  
**Bronner's** 380:1  
**Brook** 10:6  
**Brookhaven** 10:7  
**brothers** 314:1  
**brought** 6:21 102:4  
211:7 310:7 326:8  
327:15 344:4 432:9  
**brown** 71:21 72:1  
230:17  
**Brown's** 72:2  
**Brownback** 2:13 389:2  
392:5,7,8 395:4,18  
**BRS** 146:5 153:15  
196:16,19  
**Bruce** 16:7 91:10,11  
**Brussels** 391:10  
**bud** 429:15  
**buffer** 454:11  
**bugs** 34:16 170:9  
**Buie** 1:13 10:6,6 12:6,7  
12:12  
**build** 55:5 107:22  
109:12 110:13 111:21  
112:9 115:17 116:5  
126:3,10,11,13,20  
168:16 169:14 194:5  
195:8 271:22 286:3  
349:18 453:10  
**building** 111:12 121:13  
154:6 159:5 271:18  
302:20 330:22 443:20  
**built** 36:19 37:7 55:22  
64:13 69:19 108:10  
109:3 113:19 122:3  
126:21 127:16 167:13  
186:13 411:6  
**bulk** 180:7 230:15  
232:14 246:10 249:21  
**bullet** 159:21  
**bunch** 380:3  
**burden** 158:13  
**burn** 311:20 331:16  
**burner** 500:3  
**bus** 483:15

**Bush** 354:22  
**bushel** 178:1  
**bushels** 177:17,17,22  
**business** 36:5 98:18  
 111:9 119:11 201:6  
 219:10 226:1 228:1  
 256:8 268:10 379:6  
 389:20 390:14 429:16  
 449:4 453:11 470:2  
**businesses** 33:20 34:1  
 37:1 96:22 159:16  
 304:22 459:20  
**butchered** 226:9 458:4  
**buy** 38:13 243:12 376:8  
 410:19,19 415:14  
 473:14  
**buyer** 38:13,16 60:20  
 177:21  
**buyers** 27:5 36:7 60:17  
 399:4  
**buying** 276:12 307:14  
 372:5 390:11 426:1  
**buzzer** 225:1  
**bypass** 316:2 479:6  
**bypasses** 315:4

### C

**C** 1:8 4:1 400:4  
**C2F** 309:10  
**cache** 361:18  
**CACS** 8:14  
**CACS's** 290:5  
**Cal-Organic** 313:17  
 314:7  
**calculated** 236:5  
**California** 148:8,10  
 251:12 315:11 321:14  
 476:19 481:21 491:7  
 491:19  
**call** 4:2 18:13 28:1  
 110:12 116:13 118:7  
 122:10 123:14 131:15  
 133:10,18 134:3  
 137:17 141:18 155:3  
 158:6 170:8,14 243:4  
 271:3 272:5 281:2  
 298:16 317:10 357:8  
 405:21 451:21 456:12  
 467:9 468:7  
**called** 16:11,14 34:13  
 39:13 43:14 44:1  
 52:15 69:22 74:18  
 88:1,10,17 110:2  
 112:2 115:18 116:17  
 119:22 124:5 156:12  
 158:3 160:11 182:20  
 241:16 243:2 284:2  
 309:19 331:18 347:4

349:4 449:5 456:21  
 494:16  
**calling** 272:4 331:6  
 332:8 456:9,19  
**calls** 120:10 269:5,6  
**campaign** 470:3  
**candidate** 371:12  
**candidates** 70:14  
**candy** 478:12  
**capabilities** 484:3  
**capability** 38:20 65:17  
 114:2 128:12,13  
 159:14  
**capacity** 45:10 105:15  
 188:19 341:22 342:12  
 344:18,20 454:12  
 481:18 482:3,5  
 500:19  
**capital** 332:3  
**capitalize** 110:20  
**captured** 403:10  
**captures** 46:21  
**carbon** 272:17,22 277:3  
 277:6,8,14,19 349:16  
 385:16 386:5,9,10,12  
 386:15,16,19 393:12  
 408:7 445:5,7,8,9  
 446:3,5 466:14  
 470:22 472:16 473:3  
 473:12,14,15,19  
 486:15  
**carbon-based** 237:18  
**carbonaceous** 229:18  
**care** 7:22 72:10 146:5  
 153:15 169:20 189:15  
 244:3 247:2 253:6  
 374:20  
**career** 88:1,5,9 355:4  
**careful** 27:3 96:17  
 298:17 356:11  
**cares** 247:10  
**caretaker** 418:2  
**cargo** 153:7  
**caring** 359:4  
**carrageenan** 437:8,20  
**carried** 98:4 258:10  
 367:10  
**carry** 106:2  
**carrying** 145:15 320:22  
 344:18  
**cars** 231:22  
**carving** 138:19  
**case** 86:19 111:2 118:3  
 118:17 124:8 127:12  
 129:9 187:7 189:20  
 190:13 193:1 241:7  
 247:11 331:17 391:5  
 422:21 485:12 494:20

497:5  
**caseload** 130:3  
**cases** 23:15 127:16  
 128:10 187:14 479:11  
**cash** 364:1  
**cashing** 460:5  
**cast** 298:20 299:12  
**CATAIR** 182:21 183:2  
**catching** 193:10  
**categories** 88:19  
 115:14 296:14,18  
**categorizes** 118:14  
**cattle** 359:5 450:2  
**caught** 184:2 228:17  
**cause** 94:6 187:16  
 470:7 476:22  
**caused** 286:14  
**causes** 475:20  
**caveat** 216:5  
**CBP** 28:6 31:22 43:10  
 43:13 44:14,22 45:1,6  
 45:9,13,16,17 46:6  
 47:9 49:4,6 108:9  
 109:22 119:14 120:22  
 121:6,10,11 123:7,13  
 123:18 125:14,20  
 126:22 137:18,19  
 142:15 152:20 153:3  
 153:4 156:14 159:6,8  
 160:2 167:18,20  
 169:12 171:5 172:18  
 172:20,21 173:19  
 174:20,22 176:16,16  
 182:22 183:3 187:13  
 187:19 190:22 195:16  
 202:13  
**CBP's** 121:17 125:16  
 176:8  
**CCOF** 252:10  
**CD** 121:10,10  
**CDC** 135:13  
**CDP** 135:18  
**celebrate** 36:20  
**cell** 454:14 455:3  
**cellulose** 214:1  
**CEMS** 124:5,18,18  
 125:10 126:2 127:16  
 176:16 193:18  
**Censky** 15:17  
**center** 9:15 134:18  
 149:10 155:4 251:14  
 254:12 406:5 463:8  
**centered** 302:18 468:19  
 494:13  
**centers** 441:20  
**central** 270:3,12  
**centralized** 110:11  
 124:21

**century** 340:12  
**certain** 38:13,14 58:14  
 80:6 104:6 117:18  
 138:3 152:7,11 161:8  
 161:11 170:10 171:15  
 174:11 181:18,19  
 186:13 187:9 243:18  
 349:6 404:7 410:10  
 417:12 438:21,22  
 448:12 454:16  
**certainly** 108:4 121:21  
 128:22 198:16 382:7  
 439:3  
**certifiable** 376:6  
**certificate** 37:9,20 38:4  
 38:6,16 39:1 42:19,22  
 43:3 44:4 46:8 58:17  
 58:21 125:8 152:9  
 158:7,9 159:10,14  
 177:19 178:1 198:14  
 203:4 222:20,21  
**certificates** 25:5 31:20  
 37:10,16,22 38:1,11  
 38:18 39:18 43:5,22  
 45:2,12,18 46:1,11,15  
 46:20,21 56:21 68:5  
 120:12 121:2 122:1  
 154:11 157:19,20,21  
 158:2,15 159:11  
 160:5 174:14,20  
 175:6 177:15,21  
 197:7,9 198:3 202:6  
**certification** 27:1 30:2  
 35:8 38:4 62:5 161:20  
 179:6 191:4 200:7,12  
 201:18 203:3 253:3  
 257:12 289:22 291:1  
 303:13 316:4 345:11  
 345:18 346:16 353:18  
 364:22 376:3 442:18  
 443:16 463:11 464:20  
 477:22  
**certifications** 154:10  
 191:7  
**certified** 2:11 3:11  
 10:13 11:14 22:12,13  
 33:19 37:21 38:22  
 43:8 48:4 69:16 72:14  
 72:15 92:10 124:12  
 172:9 199:6,7,16  
 200:18 201:21 204:8  
 204:13,19 228:2  
 235:21 243:5,12  
 256:5 259:9,12  
 280:13 282:21 290:1  
 297:1 310:4 315:12  
 325:7 335:21 336:16  
 339:3 348:10,11

- 352:17 354:17 376:18  
377:8 382:15 392:10  
392:10 395:6 396:12  
402:19 416:17,19  
418:13 427:14 450:5  
458:12,16 459:2,12  
462:3  
**certifier** 11:6 28:1 29:12  
30:4,21 31:2,3 32:17  
33:6 35:13 36:17  
38:15,19 39:2 43:2  
50:15 54:9 57:9 60:19  
62:3,11 65:11 77:2  
158:13 161:9 181:11  
181:12,14 198:20  
200:14,20 291:22  
355:5,19 372:21,22  
373:10 374:1,3,6  
447:7  
**certifier's** 56:22 58:19  
290:2  
**certifiers** 24:22 25:18  
26:16,22 27:1,16,21  
28:21 29:2,4,18,21  
30:15 32:7 34:19  
35:13 36:17,20,21  
37:3,11,15,19 39:5  
44:19 50:3 53:15  
54:11 56:13 59:10  
60:12 61:11 65:2 66:2  
68:13,17 75:14 78:15  
79:6,12 97:14 104:17  
158:20 160:13 161:22  
163:4,9,17,21 164:2,4  
164:8 165:13,17  
178:7,8,12 179:7  
182:3,7 196:7,7 197:7  
197:8,19 198:2  
205:18 274:5 292:13  
292:19 295:4,18  
355:17 356:15 374:5  
384:17 401:18 402:13  
402:19 464:5  
**certifies** 290:3 396:13  
**certify** 200:19 324:22  
336:14 346:8 355:17  
355:20 389:9  
**certifying** 189:1 460:4  
**cetera** 66:17,17 80:2  
**CFR** 57:1 146:1,2,4  
**chain** 16:22 26:10  
38:10 160:11,14,17  
160:19 161:5,10,12  
164:6,9,17,19 177:13  
178:13 198:1 200:8  
202:8 290:7 404:20  
**chains** 29:1 164:7  
165:15
- chair** 1:12,12 6:7 8:4  
10:16,17,20 11:12,15  
12:2,7,12 166:8 227:6  
290:2 359:13 388:5  
427:10  
**Chairman** 1:10 107:16  
167:11 273:17,19  
276:20 277:20 278:20  
280:4 282:5,16 285:5  
286:5 287:4 289:17  
293:6,17 294:7 295:1  
295:5 297:18 298:13  
300:19,21 304:14  
305:5,19 306:1  
308:17 312:3,11  
313:7 316:10 317:12  
318:14 320:14 321:21  
324:12,17 325:10  
328:11,13 329:7,17  
332:21 333:18 334:4  
334:6 337:12 338:6  
338:20 339:11 342:16  
344:21 347:14 350:11  
350:15 352:13 354:9  
354:11 357:15,18,20  
359:9 360:1,7 363:4  
363:12,20 366:11  
367:1,21 369:20  
371:17,20 373:21  
374:9 377:10,13  
379:16 380:7 381:2,9  
381:12 382:3 385:12  
386:21 387:18 389:1  
389:5 392:3  
**challenge** 193:5 251:1  
299:10 331:22 332:5  
382:21 476:10 480:17  
485:7 486:6 491:10  
496:22  
**challenged** 189:4  
**challenges** 93:8 340:1  
349:7,21 351:20  
475:9 490:20 491:1  
491:13  
**challenging** 443:5  
491:6  
**champions** 442:6  
**chance** 140:15,18  
193:11 282:4 313:2  
354:19 357:6 462:1  
**change** 21:6 35:14 79:3  
112:1,12 139:17  
145:8 173:9 175:7,8  
177:5,6 179:14,22  
188:10 195:11 203:20  
204:4,22 219:18  
280:22 297:15 331:10  
331:14 337:6,7 349:9  
349:16 352:3 366:19  
368:8 402:12 414:15  
418:5 454:13 475:16  
**changed** 32:18 122:4  
192:21 257:5 300:10  
380:21 463:16  
**changes** 19:22 26:12  
112:10,17 139:14,16  
139:20 140:18 144:21  
144:21 161:13 170:10  
180:14 217:7 252:1  
253:14 293:1 296:5  
297:4 340:10 341:5  
454:18,19  
**changing** 336:11  
496:16  
**channel** 467:18  
**chapter** 428:7  
**character** 226:16  
449:17  
**characteristics** 252:13  
**charge** 86:22 104:1  
107:4 184:3 411:18  
**Charlotte** 3:13 322:7  
427:6 433:8,11 441:2  
441:4  
**chart** 144:19 145:9  
**chart's** 145:8  
**cheap** 335:10  
**check** 45:2 135:14  
184:17 197:9  
**checked** 119:18  
**checking** 185:3  
**checklist** 58:1 78:13,19  
78:22 79:3  
**checkoff** 203:17,20  
**checks** 135:7  
**chemical** 149:18  
151:14 186:10 230:3  
284:3 417:21 494:1  
**chemicals** 247:13  
356:22 362:21 402:14  
417:5,13 421:7 450:1  
**Chemistry** 362:2  
**Chesapeake** 258:5,6,7  
260:11 261:16,19  
262:2  
**chicken** 246:7 248:4  
267:11 413:15 414:1  
414:3  
**chicory** 275:21  
**child** 304:10 394:4  
**children** 102:4,11 362:4  
385:4,7 390:13  
**children's** 464:2  
**Chilean** 443:1  
**chile** 175:18  
**Chipotle** 380:14
- chlorine** 212:15  
**chlorite** 21:13 212:14  
**chocolate** 266:14  
**choice** 82:17 459:1  
474:9  
**choices** 448:15  
**choose** 26:7 335:21  
338:8  
**chooses** 151:4  
**choosing** 337:10  
**chose** 20:16 164:21  
437:8  
**chosen** 375:22  
**chronically** 343:11  
**circle** 146:14 269:19  
270:16  
**circles** 383:4  
**circulating** 364:11  
452:14  
**circumstances** 340:2,3  
**circumstantial** 77:18  
**circumvent** 187:16  
191:3  
**cisgenesis** 435:3  
**cite** 362:13  
**citizens** 341:19  
**citrate** 210:7,8 212:14  
221:1  
**citric** 500:5  
**citrus** 116:22 117:16  
148:8,9  
**civil** 24:5,14 26:17  
355:4  
**civilization** 284:22  
**claim** 386:4  
**claiming** 302:3  
**claims** 104:18  
**clarification** 226:2  
263:7,20 293:2  
**clarify** 53:22 64:5  
152:13 241:8 251:21  
252:4 292:1,13  
**clarifying** 396:18 398:3  
**clarity** 155:18 398:10  
**CLAs** 77:12  
**class** 328:2  
**classification** 187:9  
188:1 211:4 214:18  
368:9,18,21 369:3  
**classified** 97:7 214:20  
215:2 296:18 442:16  
**classify** 214:21 368:14  
**Claus** 231:14  
**clause** 373:16  
**Clavibacter** 318:8  
**clay** 232:10  
**clean** 349:11 375:7  
406:3 412:13 469:14

**cleaned** 423:1  
**cleaner** 259:11 330:20  
**cleanout** 201:2  
**clear** 51:17 86:3 125:20  
 129:12 192:20 193:4  
 195:15 196:2 226:19  
 271:14 272:6 278:6  
 356:10 383:11 388:8  
 390:12 400:8 405:21  
 431:10 449:8 487:6  
 494:6  
**clearance** 21:16 82:2,4  
 82:6 115:20  
**cleared** 125:15,16,18  
 126:1 449:13  
**clearly** 129:13,15 166:3  
 294:14 297:6 385:20  
 387:14 461:9 477:20  
**click** 154:19,21  
**Clif** 10:19  
**climate** 261:10 277:11  
 297:15 331:10,14  
 349:9,16 352:3  
 402:12 491:19 492:3  
**climates** 341:3  
**clippings** 485:3,4  
**clock** 222:11  
**close** 14:5 32:9 51:6  
 59:13 136:20 141:15  
 153:7 157:8 166:4  
 192:19 212:19 276:9  
 309:5 420:21 439:7  
**close-minded** 350:3  
**closed** 128:9 250:19  
 317:8  
**closed-loop** 303:9  
**closely** 113:15 439:2  
 481:4 496:14  
**closer** 194:22 358:7  
 406:4  
**closing** 58:22 127:12  
 424:16  
**cloth** 483:18 484:7  
 485:6  
**cloudy** 407:16  
**clout** 459:13  
**clover** 413:14  
**Club** 347:4  
**clue** 321:10  
**Co-director** 354:16  
**co-founder** 322:7  
**coal** 229:11,13 230:2  
 473:7  
**coal-** 230:10  
**Coalition** 239:6,7  
**coals** 229:17 230:1,2,17  
**coast** 321:2  
**coattails** 316:7 468:13

**coco** 302:9 310:11  
 316:18 446:1  
**coconut** 388:10 487:10  
**code** 38:5 180:10  
 183:17,22 187:15,16  
 187:20,22 253:4  
**codes** 183:13  
**coined** 269:18  
**coir** 302:10 310:11  
 388:10,19 446:2  
 452:20 485:20 487:10  
 490:18 496:11  
**cold** 151:16  
**Coleman** 323:21 332:17  
**coli** 465:2  
**coliform** 465:2  
**collaborate** 45:13  
**collaborative** 48:21  
 87:7  
**collapse** 453:8  
**collapsed** 397:15  
**colleague** 143:21 156:4  
 221:12 364:12 445:19  
**colleagues** 83:21 97:1  
 107:19 138:10,10  
 166:9,10 205:15  
 289:14 352:22  
**collect** 267:17  
**collected** 147:14  
 267:22  
**collecting** 197:1 266:2  
**collection** 24:2  
**collections** 115:12  
**collectively** 283:13  
**College** 10:4 106:16  
**Collier** 2:14 105:19,21  
 109:22 130:19 131:4  
 170:4 199:20  
**Collins** 2:15 416:7  
 420:10,13,13 422:14  
 422:17 423:16 424:9  
 425:2,21 426:14,18  
**collusion** 356:15  
**Colorado** 9:22 74:1  
 334:11 404:17,18  
 407:19  
**colored** 224:22  
**combating** 304:6  
**combination** 203:6  
 279:2  
**combining** 438:15  
**come** 60:7 74:6 75:1  
 84:20 86:19 88:14  
 89:6 92:17 93:1,10  
 144:9,12 149:14,21  
 150:7 151:20 160:8  
 169:2 180:5 181:10  
 181:11,13 183:15

185:17 206:10 210:5  
 239:1 241:1 253:18  
 271:4 280:2 312:8  
 321:20 322:18 334:19  
 343:16 344:3 353:13  
 361:21 370:12 376:7  
 392:19 393:15 402:15  
 402:17 407:15 410:13  
 447:8 452:19 456:13  
 468:8 471:16 481:14  
 497:1  
**comes** 44:1 46:13  
 114:3 143:5 163:4  
 254:18 261:3 279:4,6  
 285:16 299:15 300:7  
 310:4 321:4 334:15  
 361:4,5 365:12  
 459:19 471:18 482:16  
 485:21  
**comfortable** 143:7  
**coming** 27:19 45:15  
 61:15 66:16 68:20  
 75:2 84:4 94:5 100:16  
 113:4 117:21 120:9  
 122:18 128:8 129:3  
 138:2 154:1 159:19  
 173:18 176:18 180:9  
 181:16 184:15 185:2  
 189:9 210:1,14  
 211:15 219:5 223:14  
 240:7 244:6 267:16  
 278:18 288:11 320:10  
 325:6 365:6 426:5  
 457:10  
**comingling** 200:11  
**commands** 327:11  
**comment** 8:10,13 15:5  
 19:22 20:1,3 21:3  
 30:16 75:8 81:13 82:7  
 83:18 85:4,6,7,20  
 86:16 96:2 98:20  
 181:8 200:4,4 224:8,8  
 224:15,17,21 226:3  
 227:8 235:17 251:20  
 260:10 274:6,11  
 293:5 294:8 299:14  
 307:8 309:10 337:21  
 348:6 350:17 360:22  
 382:14 396:21 397:4  
 397:16 398:19 401:11  
 419:1 441:13 452:5  
 474:16 479:2  
**commented** 21:2  
**commenter** 226:6,17  
 298:22 462:16  
**commenters** 100:11  
 101:6 225:10 226:14  
 246:19 297:20 416:9

**commenters'** 226:5  
**commenting** 290:5  
 293:15 392:16 396:17  
 471:7  
**comments** 4:18 12:10  
 14:12 15:3,7 20:7,14  
 20:17 81:13 91:18  
 96:7,8 199:7 225:20  
 227:4 228:4 229:9  
 231:5 238:4 259:16  
 260:11 263:9 272:13  
 294:9 298:5,6 307:2  
 313:15 322:1,13  
 337:15,17 347:17  
 350:19 358:4,20  
 359:22 364:18 368:6  
 368:7 369:6 391:20  
 396:14 398:3,16  
 407:7 416:20 427:20  
 436:9 438:15 441:16  
 444:18  
**commerce** 138:17  
 253:5  
**commercial** 43:15  
 110:3 132:7,10  
 150:10 227:20 229:20  
 450:5  
**commercially** 252:5  
 371:15  
**Commission** 276:7  
 279:16 281:16  
**commitment** 33:1  
 96:15,19 223:2  
 251:18 314:22 315:2  
 323:15,15 382:12  
**committed** 13:8 15:10  
 52:1,3  
**committee** 10:17 11:11  
 11:12,15 31:15 80:18  
 90:8,10 97:9 140:9,13  
 227:19,20 235:17  
 237:3 239:5 251:13  
 253:21 271:12 320:19  
 324:15 365:1 427:12  
 432:7  
**Committee's** 348:6  
**committees** 98:22  
**commodities** 27:18  
 105:5 109:2 114:14  
 114:17 117:6 118:6  
 118:15,18,20 122:14  
 127:1,3,4 153:1  
 180:10 182:4 189:6  
 191:1 193:1,22 204:6  
 252:22  
**commodity** 38:14 115:3  
 116:21 127:4 129:6  
 149:4,6,14 150:6

151:20,21 152:7,10  
 161:8 182:7 187:9,11  
 188:1 203:5,16  
**common** 94:6 111:15  
 126:19 136:21 137:8  
 187:7 326:16 331:11  
 331:19  
**communicate** 31:21  
 194:7  
**communication** 130:8  
**community** 13:9 14:12  
 15:10 19:21 49:19  
 92:17 94:3,15,17  
 96:20 105:2 106:22  
 110:12 111:16 132:17  
 133:13,16 140:7,14  
 141:12,15 143:3  
 163:2 164:16 167:8  
 205:10 223:13,13  
 287:14 327:7 334:14  
 341:15,18 342:9  
 369:18 375:2,4  
 382:12 410:12  
**companies** 194:10  
 278:11 280:12 381:7  
 401:15 429:16  
**company** 2:21 10:19  
 95:11 253:3 256:20  
 264:8 314:21 401:22  
 449:5  
**company's** 378:13  
**comparable** 439:11  
 461:7  
**comparative** 387:6  
**compare** 236:18  
**compared** 169:12  
 187:10 327:10 353:1  
 353:3  
**compares** 42:7 272:17  
 272:22  
**comparing** 260:16  
**comparison** 42:11  
 277:16,19  
**compatriots** 410:15  
**compelling** 367:15  
 378:7  
**compete** 128:20 462:6  
**competing** 168:8  
 391:13  
**competition** 429:18  
**competitive** 98:13  
 325:5  
**complaint** 23:18 71:4  
 71:12 72:19  
**complaints** 23:3,5,16  
 24:9,11 27:3 70:20,21  
 71:19 355:3  
**complement** 169:3

**complementary** 168:9  
**complete** 27:1 36:10  
 40:21 56:16 58:19  
 132:12 165:8 207:4  
 212:11 215:16,20  
 216:19 222:18  
**completed** 23:18 58:4  
 133:19 167:17 212:3  
 212:19 217:20 291:14  
 416:13  
**completely** 243:1 302:3  
 305:13 308:10 323:1  
 336:12 390:8 453:22  
**completing** 6:16 220:1  
**completion** 137:4  
 167:15 170:20  
**complex** 27:10 28:22  
 113:1 164:7 165:12  
 165:16 166:4 283:19  
 346:5 386:17 462:12  
 480:13  
**complexes** 361:2  
**complexity** 26:10  
 108:15 157:4 174:19  
 476:10 480:11  
**compliance** 22:9 23:14  
 23:22 27:20 31:5  
 32:19 33:5 44:19 63:2  
 73:9 74:2,3,18 75:19  
 76:2 111:7 116:3  
 124:6 127:11 128:10  
 129:11,20 130:3,5  
 147:20 180:15 187:5  
 195:12 198:21 204:11  
 291:20 294:19  
**compliant** 27:7 195:6  
 195:19 294:20 448:13  
 482:13  
**complicated** 245:16  
 311:10 312:18 365:16  
**comply** 29:22 193:12  
 238:6,8 295:19 428:8  
 428:20 448:17 475:4  
**component** 52:17  
 247:8 410:7  
**components** 61:9  
 109:9 451:22 465:14  
 486:22  
**composition** 487:14  
**compost** 2:21 228:19  
 245:11 250:10 259:19  
 263:14,19 266:22  
 311:2,4,13 312:22  
 314:14 316:18,20,22  
 319:22 370:5,20,21  
 371:1 388:20 412:14  
 413:6,15,21 423:3,3  
 425:15 449:5 450:4

451:19,20,20 452:5  
 452:14 453:22 454:3  
 455:15,20 480:6  
 483:21 485:17 486:14  
 486:18 487:9,13,18  
 487:19 488:1,14  
 496:2,12 497:12,15  
 497:16 498:1,5 501:3  
**composted** 248:4 414:1  
 485:20,21  
**composting** 336:4  
 497:11  
**composts** 424:21  
 496:19  
**compounds** 82:18  
**comprehensive** 60:10  
 79:18  
**comprehensively**  
 184:20  
**comprised** 111:19  
**compromise** 179:8  
 305:7,9,9,11,16  
 306:16,17 319:12  
 328:21 329:4,6 334:2  
 366:14 382:1,1  
 395:20 406:19 411:4  
 415:1,8 420:3 424:19  
 461:20  
**compromising** 334:20  
**computer** 115:19  
 189:12  
**computers** 100:13  
 224:12  
**conceiving** 126:8  
**concentrated** 408:15  
**concentrating** 323:1  
**concentric** 269:19  
**concept** 32:4 61:18  
 64:14 65:3 126:9  
 173:18,22 199:17,21  
 301:21 330:15 334:13  
**concepts** 39:19 64:12  
 162:10 199:11  
**concern** 66:14,16 75:5  
 77:5 255:2 258:6  
 287:20 371:3 397:7  
 445:13 461:1 467:13  
**concerned** 74:22  
 191:18 242:9 287:14  
 421:6 459:15,17  
 467:12 469:21  
**concerning** 256:3  
 358:1  
**concerns** 92:21 140:16  
 151:2 228:11 234:11  
 234:17 432:2  
**conclude** 466:2,6  
**conclusion** 74:6 207:5

**concurrently** 65:16  
**condition** 49:2 202:22  
 450:20  
**conditions** 150:18  
 236:11 252:11 444:3  
 477:1,21 478:4,5  
 486:17  
**conduct** 31:3 57:8 59:9  
 75:3,13 120:11  
**conducted** 27:20 41:16  
 50:22 52:8 57:13  
 122:22 141:13 291:21  
 315:17 362:14 464:22  
 466:8  
**conducting** 30:8 98:17  
 151:8  
**conducts** 40:6 47:12  
 125:7  
**confidence** 191:10  
 378:19 379:2  
**confident** 298:7  
**confidential** 372:20  
 373:3  
**confidently** 297:22  
**confined** 335:6  
**confines** 93:4  
**confining** 451:10  
**confirm** 38:3,6 44:19  
 161:15  
**confirmation** 292:15  
**confirmed** 230:4  
**conflict** 97:5 98:15,16  
 99:11,14  
**conflicting** 373:18  
**conflicts** 98:8 99:1,7  
 476:12 478:2  
**confounding** 389:17,18  
**confuse** 383:16 411:5  
**confused** 393:21  
 437:16 489:8  
**confusing** 229:10 393:7  
 422:4  
**confusion** 272:11 293:3  
 307:21 460:1 469:22  
**congratulations** 37:14  
 392:20  
**Congress** 110:6 139:17  
 173:7  
**conjugated** 74:15  
**connect** 36:7 158:11  
 161:3  
**connected** 279:12  
 332:18 384:11  
**connection** 275:19  
**connections** 34:17  
**conquerors** 341:17  
**CONSCIOUS** 328:15  
**consensus** 12:14 137:7

- 139:13  
**consequences** 321:18  
**conservation** 9:16  
 254:17 295:17 298:12  
 389:12 394:14 463:10  
**conservationists** 97:15  
**conserve** 297:9  
**conserving** 276:5  
**consider** 39:1 93:1  
 157:12 163:11 164:12  
 246:20 254:13 255:8  
 261:5 268:18 281:16  
 295:15 342:10 364:17  
 401:21 403:13 430:1  
 451:4  
**consideration** 162:22  
 208:15 210:20 211:8  
 213:12 218:19 276:13  
 367:19 391:20 444:18  
**considered** 20:22 22:20  
 98:17 99:6 129:16  
 207:2 210:22 262:2  
 296:11 388:11,14,15  
 431:5,9 464:4,6  
 472:12  
**considering** 31:4 192:1  
 331:6 436:8 442:20  
**consistency** 24:3 369:3  
**consistent** 306:12  
 359:6 440:16  
**consistently** 129:5  
 220:1  
**consists** 227:17 232:7  
**consortium** 280:12  
**constant** 250:22  
**constituency** 307:3  
**constituents** 298:10  
**constraints** 71:3 138:8  
**construct** 321:15  
**constructive** 130:12  
**consultation** 431:17,19  
 474:21  
**consulted** 431:21 464:9  
**consulting** 3:10 268:9  
 269:11 361:10  
**consumer** 3:13 232:18  
 242:7 246:22 247:7  
 249:11 268:12,17  
 272:11 314:8 359:6  
 378:19 407:14 433:12  
 433:13 434:3,7,20  
 436:11,16,18 461:6  
 469:22  
**Consumer/Public** 11:1  
**consumers** 26:7 94:18  
 97:16 129:2 148:21  
 242:8 244:17 246:19  
 247:1 253:6 269:3  
 272:5,14 276:11  
 278:2 279:2,20  
 307:13 336:21 356:19  
 361:21 362:9 375:5  
 375:16 376:4,7 379:1  
 407:7,11 408:14  
 421:17 429:17 433:15  
 434:9,10,21 435:12  
 436:12 440:9,17  
 442:2 459:11,22  
 460:2 462:9 463:18  
**consumption** 94:8  
 190:11  
**contact** 79:20 120:7  
 135:18,20 158:14  
 233:3  
**contacting** 23:9  
**contain** 56:22 237:21  
 263:13 376:22 428:1  
**contained** 400:3  
**container** 47:13 235:18  
 235:20 236:3 237:4  
 237:10,12 238:16  
 241:7 252:9,17 256:4  
 257:5,10 259:13  
 263:11 265:13 267:12  
 267:20 274:8 281:19  
 291:19 302:2,13  
 303:10,12,20 305:1  
 305:15 310:1,6,7,8  
 312:21 315:3 319:18  
 325:1 331:7,18  
 332:10 333:22 338:12  
 338:18 348:7,19  
 357:10 366:15 383:15  
 385:6,18 386:14  
 388:4 393:19 415:10  
 415:11 424:19 425:10  
 436:7 441:14,16  
 442:8,12,14 443:11  
 443:22 444:5 445:22  
 447:12 448:6 450:4  
 451:5 454:1 456:4,6,9  
 456:12,13 474:16  
 475:1,5,7 477:8  
 478:17 479:13 480:22  
 481:8 485:18 486:12  
 489:11,16 492:10,15  
 497:17,21 498:14  
 501:1  
**container's** 267:18  
**container-growing**  
 313:14  
**container-grown**  
 493:18,18  
**containerized** 316:1  
 321:12  
**containers** 118:12  
 235:15 263:11 264:12  
 264:20 265:9,22  
 267:15,20 282:8  
 291:17 294:20 304:17  
 304:18 312:14 324:3  
 328:16 333:3 335:5  
 356:18,18 395:16  
 415:1,8 420:3 424:22  
 447:22 451:3 461:19  
 461:20 479:10 483:21  
 487:8 489:9,11  
 495:21 497:15 499:10  
**contaminated** 273:12  
 288:12,16  
**contamination** 287:15  
 476:2  
**contemplate** 163:15  
**contemplates** 111:11  
 126:5  
**contemporary** 284:3  
**content** 157:14 317:19  
 362:11 367:18 377:2  
 387:7 452:9  
**contents** 372:8  
**context** 22:21 26:4 47:3  
 53:8 268:18  
**contexts** 306:10  
**continual** 137:9 402:17  
 404:15 406:8 495:14  
**continue** 8:12 14:14  
 16:22 24:8,16 26:7  
 28:18 29:9 31:14  
 33:16 34:16,21 58:15  
 59:6,8 65:16 73:16  
 78:22 92:18 93:3  
 95:19 101:9 139:12  
 139:19 142:21,22  
 190:12 191:21 237:16  
 244:2 276:12 304:12  
 304:22 331:16 369:17  
 394:16 403:19  
**continued** 22:17 368:20  
**continues** 55:16 79:2  
 94:17 111:21 138:21  
 140:21 195:8 343:18  
 344:2  
**continuing** 30:20 31:3  
 39:4 65:11,12,13  
 76:18 95:22 140:20  
 157:13,16 190:8  
 419:22  
**continuity** 89:18  
**continuous** 52:18  
 270:15,19 271:12  
**continuum** 144:15  
 146:9  
**contract** 52:10 174:7  
 219:11,12,15,19  
 220:3,9,17,19 221:1,2  
 221:8 404:21  
**contracting** 218:3  
 223:17  
**contractor's** 126:18  
**contractors** 126:18  
 167:19 168:12 220:17  
 221:5,5,9  
**contracts** 219:9 221:4  
 373:16  
**contrary** 275:2,13  
 343:1 359:3  
**contribute** 261:12  
**contributing** 260:14,21  
 261:6  
**contributions** 130:16  
**contributor** 262:2  
**control** 26:11,13,19  
 28:16 30:13 35:18  
 75:12 104:16 114:1  
 134:18 172:6 211:20  
 230:7 250:13 257:21  
 318:5 358:22 417:20  
 421:15 461:10 493:3  
 493:22 498:3  
**controlled** 273:13  
 464:14  
**controlling** 260:18  
**controls** 41:3,12  
**controversial** 247:20  
**convene** 91:14  
**convention** 493:21  
**conventional** 74:16  
 183:17 191:2 261:2,6  
 274:15 277:22 278:8  
 278:16 310:12 312:1  
 314:21 383:4 384:1,3  
 384:22 386:5 471:12  
 474:22 482:17 493:12  
 493:17 494:6,7,9  
 495:8  
**conventionally** 261:21  
**conventionally-crop...**  
 314:9  
**conversation** 64:21  
 83:15 173:2 174:9  
 175:3 240:10 370:11  
 378:7  
**conversations** 69:17  
 94:1 100:13 172:18  
 174:3 298:17 329:21  
 330:2  
**Conversely** 229:22  
**conversion** 274:18  
 296:3 297:3  
**convert** 253:17 278:7  
**converted** 299:22  
**conveyed** 292:19

- convince** 274:11  
**cooperation** 240:12  
**cooperatives** 361:11  
**coordination** 111:5  
**copies** 120:15  
**core** 32:11 133:3,19  
167:16,18 170:14,21  
171:2 196:20 266:22  
408:12,22,22 444:1  
**corn** 104:6 161:8,12  
177:16,18 189:8  
261:22 288:11,16,18  
418:14  
**Cornucopia** 2:15,17 3:3  
330:8 334:10 336:19  
354:16 358:2 359:13  
**corporate** 307:4 331:14  
332:1 355:22 421:14  
**Corporation** 231:13  
**corporations** 460:5  
**corps** 89:17 91:2,3  
**correct** 55:3 85:14  
87:11 119:7 194:7  
196:4,6 203:11 231:2  
237:10 238:20 241:10  
248:5,9 285:12 295:5  
343:4 366:8 373:15  
388:15,21 396:8  
407:10 412:2 489:5  
**corrected** 204:2  
**corrections** 12:10  
**corrective** 54:2,4,6,14  
54:16,20 55:4 56:1  
57:7 59:5  
**correctly** 85:1 193:17  
255:5 439:18  
**corrupt** 355:9  
**corruption** 354:20  
**cost** 38:3 174:6 233:12  
404:16 481:14  
**Costa** 322:20  
**costs** 111:8 246:2,3  
459:5  
**Council** 11:2 112:3  
140:12 168:2  
**Counsel** 176:4 177:9  
**count** 22:12 410:14  
**counter** 477:15  
**counties'** 466:10  
**counting** 374:18  
**countless** 96:21 223:11  
**countries** 27:16 43:7  
45:4 69:1,10,14,18  
146:17 164:8 174:11  
182:4 198:11 323:4  
361:6,7  
**countries'** 41:8 114:5  
**country** 42:6 110:9  
111:1 112:22 113:8  
116:10 125:2 129:4  
134:8 138:2 147:19  
149:4 150:20 151:4  
152:20 174:17 181:19  
182:8 190:10 203:5  
242:15 261:9,14  
274:19 282:9 287:8  
287:18 322:11 355:16  
415:21 463:13  
**country's** 42:8 466:10  
**counts** 68:15 160:16  
**County** 473:11  
**couple** 13:22 18:4  
64:10 108:6 112:10  
133:1 157:22 180:14  
188:3 200:17 220:20  
223:6 224:9 317:7  
323:2 357:17 450:9  
450:10 451:12 493:22  
**coupled** 283:22  
**couriered** 121:11  
**course** 18:21 108:5  
164:22 168:18 209:12  
217:14 222:19 247:6  
248:11 311:12 341:10  
360:10 496:6 499:22  
**court** 32:14  
**courteous** 100:10  
**cover** 108:7 136:16  
144:10,14 145:20  
149:20 159:15 218:22  
241:19 246:8,9 250:6  
250:7 262:4 303:17  
314:14 336:3 364:4,6  
370:4 418:18 447:9  
447:19,22 448:6  
478:14 480:20 483:18  
484:11,21 485:13  
**covered** 151:18 152:11  
155:5 291:6 292:3  
360:9,14 423:18  
483:17  
**covers** 30:1,4  
**cow** 73:22 426:8  
**cow's** 384:2  
**cows** 74:13 75:2 77:10  
77:14 384:6,8,8,11  
399:15 417:1,6  
**craft** 321:9,19  
**crash** 164:22  
**Crawford** 2:15 329:19  
330:5,5 333:6,11  
334:1,5  
**create** 45:1 46:22 98:13  
161:2 236:21 249:8  
272:7,10 308:10  
375:13 402:8 422:6  
433:15,17 443:8  
460:10 476:22 486:3  
**created** 147:4,10 249:8  
303:14 411:12  
**creates** 121:1 301:12  
475:8 478:1 485:7  
**creating** 158:1 353:10  
460:1 478:4  
**creation** 141:21  
**creative** 468:9  
**creativity** 443:10,19  
444:12  
**credenials** 460:3  
**credibility** 410:10  
**credible** 297:17  
**credit** 466:4  
**Crisantes** 2:16 231:7  
235:7,10,12 238:8,12  
239:4,18 240:16  
241:10  
**crises** 349:8  
**criteria** 76:2 87:5  
150:12 165:12 204:10  
207:6,9,11,15,21  
208:3,4,5,10 209:15  
209:18 290:21 399:8  
**criterion** 434:19  
**critical** 36:2 51:18  
95:13 109:6 129:6  
138:19 165:6,10  
170:8 173:3 292:17  
403:4 435:17  
**critically** 82:21  
**crop** 12:1 190:4,4 208:7  
209:1 229:8 236:3  
241:19 245:18 248:22  
249:21 250:4,5,6,7,13  
250:18 255:4 256:2  
257:10 258:17 259:4  
262:19 275:18 276:3  
286:2 303:16 304:15  
312:13 314:15 318:18  
319:18,20 320:1,2,6  
320:10 362:12 364:1  
364:2,6 370:4,19  
377:3 381:13 391:9  
391:10,11 412:6,16  
414:17 422:16,18,21  
427:18 446:20 447:3  
447:5,19 476:15  
477:5 478:21 479:15  
480:20 495:10  
**Cropping** 327:6  
**cropping** 246:8,10  
262:5 314:15 336:3  
476:13 477:6 485:13  
**crops** 2:18 8:13 11:11  
12:2 105:18 109:11  
114:15 115:2 190:8  
208:13 210:2 232:21  
235:17 237:3 241:19  
243:16,20 245:14  
250:19 252:21 261:11  
262:4 274:6 275:18  
287:10,15,16,19,21  
289:3,11 303:17  
313:20 320:19 324:14  
364:5 395:15 411:16  
412:21 413:12 414:5  
414:9,16 418:18  
422:22 428:10 432:7  
436:5,6 441:13 445:9  
446:16 447:9,22  
448:7 454:3 461:18  
475:7 476:4 478:14  
483:18 484:11 491:11  
**cross** 337:19  
**cross-communication**  
142:5  
**cross-departmental**  
108:13  
**cross-production**  
370:3  
**crosses** 198:9  
**crossing** 120:6  
**crossroads** 326:22  
**crostalk** 83:8  
**crushed** 361:13  
**crust** 282:14 283:3  
284:6,16,16  
**crutch** 229:4  
**crux** 348:6  
**CS** 333:22 415:1,8  
420:3  
**CSA** 395:8  
**CSAEC** 3:13  
**cucumbers** 310:19  
403:8  
**cukes** 405:4  
**cultivate** 485:11  
**cultivated** 296:8,10  
**cultivation** 274:19,21  
**cultural** 296:16 300:4  
300:12  
**culture** 283:12 466:21  
467:17  
**curious** 84:6 90:7 167:6  
185:15 267:14 276:22  
423:11 425:16  
**current** 8:18 22:11  
29:17 45:10 57:1  
58:18 157:12 164:1  
183:21 192:15 204:16  
212:6 217:8 220:17  
230:22 292:22 320:18  
340:2,3 357:14 461:8

475:6 477:16 484:22  
**currently** 10:20 11:11  
 18:9 33:8 43:5 55:13  
 55:15 56:9 72:14  
 148:9 154:3,5 171:16  
 211:16 212:1,8,10  
 275:8 295:7 310:4  
 320:16 343:8 376:2  
 378:22 392:10 395:5  
 440:1 463:8 487:1  
**curve** 35:12 267:5  
 425:9 475:21,22  
 477:6 487:16,16  
 500:18  
**curves** 478:15 496:21  
**custody** 123:18 129:17  
**Custom** 155:11  
**customer** 23:11 35:17  
 40:10 155:3 232:13  
 247:9 408:12 456:14  
**customers** 147:5  
 315:17 335:22 353:22  
 361:15 402:1,3,7,15  
 403:14 406:7 409:1  
 410:13 411:5,11  
 421:11 422:4 450:22  
 454:22  
**customers'** 402:22  
**customize** 37:19  
**customs** 2:14 28:6  
 31:22 43:9,10 105:20  
 106:13 110:4 118:9  
 120:1 121:4 129:17  
 140:9 150:15,22  
 151:2  
**cut** 305:21 307:18  
 444:22 488:19,22  
**cute** 309:16  
**cutting** 151:1 381:16  
**cycle** 472:2 480:15  
 482:5 495:21 497:3  
**cycled** 333:4  
**cycles** 429:3  
**cyclical** 118:22  
**cycling** 333:2,7,11,13  
 385:17 478:16

## D

**D** 210:7,13  
**D.C** 144:13  
**daily** 55:6 302:8 481:5  
 486:10  
**dairies** 36:6 319:15  
 383:19  
**dairy** 12:1 32:19 73:22  
 77:6,16 211:18  
 359:18 382:8 383:22  
 384:6,7 402:5 473:3

**damage** 145:16 378:10  
**damning** 338:18  
**Dan** 1:18 10:21 167:1  
 173:12 184:7 188:18  
 277:1 317:12 369:20  
 371:17,20 379:22  
 385:13 386:21 403:22  
 404:11  
**Dan's** 188:9  
**dangerous** 146:16  
**Daniel** 2:14 105:19  
 109:22 119:6 123:15  
 130:19,22 143:20  
 155:11 156:2 157:6  
 166:5 167:16 169:1  
 170:2 176:8 190:18  
 193:22 199:18  
**Daniel's** 118:8 130:18  
 159:19 175:13  
**dashboard** 36:17,19  
 37:3 39:5  
**data** 25:2 35:11,19 36:9  
 36:14,17,18,20 37:2  
 39:4,5 44:8 46:16,21  
 67:3,6,7,8 68:1,10,11  
 68:17,18,20 69:19  
 70:1,1,2 109:19  
 113:22 114:2 115:3  
 115:10,16,17 116:1  
 120:22 121:2,9,11,17  
 123:1,5,7 124:17  
 125:9 131:20,20,21  
 132:5,18 136:9  
 137:14 141:12 142:4  
 142:9,9 157:14  
 158:18,20 162:3,6,7  
 176:17,18,20 178:12  
 181:10,13,16 182:5  
 196:15 197:16 204:18  
 261:5 269:4 385:21  
 385:22 386:1 463:15  
 465:1  
**database** 13:20 22:14  
 24:19 26:2 32:3 33:18  
 34:2 37:11 40:22 49:7  
 64:18 67:5 68:8 69:4  
 69:11,15 72:14 182:2  
 201:6  
**databases** 203:10  
**datasets** 122:10  
**date** 37:2 56:20 57:2  
 64:5 165:1 217:4  
 297:3  
**dates** 58:21  
**daughter** 328:21  
**Dave** 1:16 2:13 10:2  
 63:8 82:10 83:19 90:3  
 103:1 184:7 188:7

287:5 300:22 308:18  
 308:19,21,22 312:3,4  
 312:9,15 320:5 322:8  
 322:22 350:15 360:7  
 380:7 394:20 423:8  
 444:19,21 445:1  
 446:17 470:21 495:15  
 498:7  
**Davey** 3:7 313:8 322:2  
 322:3,5 324:12,17  
 352:15  
**David** 19:7,9 77:15  
 313:7  
**David's** 19:9  
**Davis** 2:17 308:19  
 313:8,11,11 316:15  
 317:21 319:3 321:1  
**day** 8:11 75:1 77:16  
 153:8,8 183:9 216:2  
 266:6 304:6 305:15  
 318:2,2 326:17 440:6  
 440:15 476:6  
**days** 92:20 96:12 121:5  
 153:9 232:2 266:10  
 269:10 367:6 426:7  
**de** 1:15 9:10,10 184:16  
 185:3 487:8  
**deadline** 133:7 141:1  
 143:5 215:21  
**deal** 69:7 126:5 191:20  
 275:8 339:22 380:22  
 467:11 484:20  
**dealing** 60:12 93:5  
 105:3 193:21 205:22  
 243:11  
**dear** 451:15  
**death** 310:21  
**debate** 96:18 99:21  
 302:1 311:14,16  
 328:6  
**debated** 277:9 338:2  
**debugged** 193:19  
**decade** 369:13  
**decades** 109:21 375:11  
 403:17 460:7  
**decanol** 208:18  
**deceive** 459:22  
**deceived** 376:4 429:17  
**December** 30:17 122:4  
 133:2 141:1 170:16  
**decent** 224:13  
**decide** 468:14  
**decided** 256:19 309:17  
 317:9 449:22  
**decides** 125:3  
**deciding** 116:8  
**decimal** 454:19  
**decision** 111:7 125:17

211:4 213:14 275:1  
 281:11 317:16,20  
 355:9 356:9 360:13  
 368:16 370:13 373:18  
**decision-making** 373:6  
**decisions** 25:9 53:20  
 207:16 210:18 264:18  
 269:7 274:13 390:2  
 429:16  
**deck** 227:5,6 420:10  
 433:9 458:5 462:17  
 474:4  
**declined** 390:1  
**declining** 297:11 349:9  
**decompose** 487:20  
**decomposes** 267:13  
**decrease** 490:11  
**decreased** 490:12,13  
 490:17  
**dedicated** 55:18 96:1  
**dedication** 14:17  
**deemed** 152:15 435:1  
**deep** 28:14 337:1  
 467:16  
**deepen** 29:10  
**deepest** 19:2  
**default** 123:13  
**defensible** 32:22  
**deferred** 8:17  
**deficiency** 428:15,16  
 428:18  
**deficit** 190:10  
**define** 42:15 129:15  
 150:17 296:12 299:19  
 385:3,5,18 388:21  
 410:1 477:20 482:16  
**defined** 129:16 228:8  
 237:20 257:5 275:20  
**defining** 252:13  
**definitely** 111:8 121:18  
 142:15 148:13 184:4  
 196:22 240:10 293:19  
 307:12 426:3 449:10  
**definition** 254:1 257:4  
 259:7 298:2 299:1  
 332:14 366:15  
**definitions** 299:20  
 300:3 368:17  
**definitive** 319:7  
**deforested** 390:8  
**degraded** 297:12  
**degree** 108:15 264:7  
 270:14 404:6  
**degrees** 106:18  
**deliberate** 111:14  
**deliberating** 100:19  
**deliberations** 80:1  
 371:8

- deliberative** 356:1  
**deliver** 359:16  
**delivered** 237:14 457:1  
**delivering** 259:22  
 404:21  
**demand** 190:14 314:8  
 342:21 403:14 460:7  
 491:17  
**demanding** 129:4 492:1  
**Demeter** 2:20 282:19  
 288:2,6,9,15 380:1  
**demonstrates** 22:17  
 237:2  
**demonstrating** 422:19  
**denied** 443:16  
**denigrate** 272:2  
**denigration** 325:8  
**denitrification** 266:11  
**Denmark** 275:13  
**density** 344:5,6,8,11,13  
**Denver** 122:21 228:16  
 229:9  
**department** 1:1 11:5  
 37:17 40:7 74:3  
 105:19 106:5,12,15  
 108:9 113:10 114:8  
 130:4 131:2 134:15  
 134:21 147:4,10  
 169:4 190:6 389:8  
 427:11  
**Department's** 40:10  
**departments** 83:13  
 110:19 112:18,20  
 169:5  
**depend** 168:17 410:14  
 452:9  
**dependent** 342:12  
 426:17  
**depending** 125:4 135:1  
 198:11 208:6 248:12  
 495:10  
**depends** 118:13 483:4  
 484:14  
**depleted** 349:11  
**deployments** 141:2  
**deposits** 229:16,19,20  
 231:2  
**deputy** 2:6 5:9 8:3 13:5  
 15:16 17:10,13,16  
 51:16 87:13,17,22  
 89:13 95:4,8 169:13  
 169:16,17 179:18,18  
**derision** 450:13  
**derivatives** 371:9  
**derive** 263:15  
**derived** 229:11 230:11  
 231:1  
**describe** 187:2 196:16  
 332:11 385:9,15  
 492:11 494:6  
**described** 54:3 184:11  
 196:13 200:20  
**describing** 230:22  
 467:3  
**description** 88:17  
**desert** 286:11,13 287:3  
 361:4 481:13  
**deserved** 224:2  
**deserves** 477:11  
**design** 164:6  
**designated** 2:7 5:16  
 150:7 170:15  
**designation** 328:1  
**designed** 110:7 161:15  
 207:20 376:22  
**desirable** 327:11  
**desire** 444:9  
**desk** 57:15  
**destination** 125:5  
**destroy** 127:21 152:16  
 486:17  
**detail** 52:21 176:13  
 196:17 224:18 294:11  
 347:6 446:8  
**detailed** 57:5,21 60:10  
 63:11 159:5  
**details** 35:8 199:22  
 253:21 438:14  
**detect** 160:15  
**detected** 288:7  
**detection** 147:21  
**deter** 100:20 104:10  
**determination** 99:14  
 135:14 373:1  
**determinations** 437:15  
**determine** 53:5 188:2  
 191:11 202:4,20  
 248:3 300:4 476:5  
**determined** 104:6  
 123:20 209:14 236:11  
 236:16  
**determining** 41:7 54:9  
**detrimental** 378:5  
**develop** 45:12 46:10  
 49:15 130:10 157:16  
 316:5 415:21 457:13  
**developed** 64:15 81:4  
 132:11 144:2 214:7  
 252:4,10 403:16  
 467:18  
**developers** 35:5 126:17  
**developing** 21:5 32:3  
 39:19 158:9 371:8  
 405:1,14 435:21  
**development** 47:1  
 65:18 111:20,22  
 126:2 129:18 132:6  
 137:9 139:11 140:1  
 141:10 154:6 158:1  
 158:17 160:9 167:16  
 167:18 171:1,3,4,11  
 177:12 211:12 212:12  
 213:9 218:3 254:9  
 315:5 402:12 474:19  
 474:20 477:5  
**develops** 284:9  
**devices** 101:5 162:4  
**Devin** 95:18  
**Devon** 2:5 18:20  
**devote** 14:10  
**DFO** 5:16 99:12  
**DHA** 355:2,14,20  
**DHS** 130:19  
**dialog** 83:4,22  
**dialogue** 104:20 107:6  
 192:8 205:9,16  
**diatomaceous** 233:5  
**dictate** 33:5  
**dictated** 371:2  
**dictates** 90:17 476:3  
**dictionary** 69:20  
**die** 335:16  
**dies** 310:21 311:6  
**difference** 66:22 71:17  
 72:8 169:10 242:20  
 257:20 302:10 307:13  
 333:2,7 385:16  
 407:13 413:22 414:4  
 414:6,12 438:4,5  
 439:15 446:15 471:11  
 471:13 492:13 493:17  
 494:7,13 499:19  
**differences** 42:10 92:22  
 191:1 362:10 437:5  
 437:13 438:22 478:19  
 492:12 494:11  
**different** 31:6 33:17  
 36:14 58:6,8 90:20  
 94:4,5,11 112:18  
 114:9,14 117:6  
 120:15 122:10 123:16  
 126:21 127:1 157:3  
 161:17 162:10 163:15  
 165:2 178:6,7 182:18  
 192:17 207:11 208:6  
 211:7 212:21 243:1,2  
 244:22,22 245:1,12  
 248:11 255:9 264:17  
 265:18,20 267:5  
 277:17 280:1,2,2  
 300:8 302:3 305:14  
 307:6,10 309:13  
 313:20 338:16,19  
 371:14 389:15 415:12  
 415:12 425:16 427:2  
 438:21 455:6 462:19  
 462:21 465:8 466:5  
 469:17 472:9 476:13  
 480:9 496:19,19  
**differential** 404:8  
**differing** 305:10  
**difficult** 94:10 249:7,7  
 249:15 303:13 318:12  
 339:9 425:8  
**difficulties** 357:5  
**difficulty** 121:1 404:3  
**digestate** 208:20  
**digital** 34:17  
**dihydrogen** 212:13  
**diligence** 27:6  
**diligently** 384:8  
**diluting** 77:17 460:3  
**diminishes** 229:13  
**diminishing** 93:1 347:2  
**dioxide** 212:15  
**dip** 211:18  
**dipping** 149:19  
**direct** 353:22  
**directed** 201:16  
**direction** 289:9 342:13  
 406:2  
**directions** 94:12  
**directives** 27:15 31:3  
 431:15  
**directly** 98:9 162:1  
 234:12,18 262:18  
 432:2 478:2  
**director** 2:4,18 11:2  
 18:18 73:9 105:13  
 106:10 251:11 282:20  
 289:22 355:7,18  
 356:14 368:4 374:15  
 382:8 463:8  
**directors** 111:17  
 194:16 290:3 330:7  
**dirt** 258:12,12 259:1  
 405:1 417:17 464:1  
**dirt-grown** 406:11  
**dirt-in-the-ground**  
 403:12  
**disagree** 236:14 468:6  
**disappointments**  
 336:19  
**disclaimer** 180:15  
**disclose** 99:7 100:2  
 225:22 372:15 373:17  
**disclosed** 219:22 220:5  
**disclosure** 219:21  
**discourage** 67:16  
**discouraged** 93:7  
**discover** 108:20  
**discovered** 318:12

355:1  
**discreet** 317:15  
**discrepancies** 53:3  
**discrepancy** 57:3  
**discretion** 85:8  
**discuss** 108:22 131:13  
 139:4  
**discussed** 131:13  
 371:9 383:3  
**discussing** 93:20  
**discussion** 47:9 98:19  
 105:11 166:12 203:14  
 205:17 213:18,20  
 279:5 285:15 310:1,2  
 371:3 429:22 452:13  
 454:8 480:9  
**discussions** 84:13,17  
 93:17 280:1  
**disease** 134:18 146:13  
 254:9 318:11 475:20  
**diseases** 318:8  
**disinfectants** 79:19  
**disingenuous** 376:12  
**dismissive** 450:13  
**disparage** 318:20  
**disparaging** 353:2,17  
**disparate** 421:6  
**disperse** 300:16  
**displayed** 99:4,16  
**disproportionate** 98:6  
**disproportionately**  
 98:9  
**disputes** 92:21  
**disregard** 353:8  
**disregarded** 411:10  
**disrespected** 453:9  
**disrespectful** 470:16  
**disrupt** 253:5  
**disruption** 405:6  
**disruptions** 101:9  
**disruptive** 101:7  
**disservice** 376:20  
**dissolve** 257:18 259:18  
**dissolved** 257:20  
**dissolving** 259:21  
 260:5  
**distinct** 199:14  
**distracting** 100:17  
 101:6  
**distressed** 455:6  
 456:17  
**distributed** 12:9 161:18  
**Distribution** 378:2  
**distributors** 291:16  
 404:19  
**district's** 389:12  
**diurnal** 486:10  
**dive** 52:22 164:21

**diverse** 94:15 237:7,11  
 299:7  
**diversified** 250:15  
**diversity** 252:16 262:3  
 298:1 349:10  
**division** 2:4,18 18:17  
 24:1 57:11 105:10,14  
 106:11 108:11 109:1  
 114:12,17 116:9,12  
 118:7,18 119:1  
 120:17,19 122:17  
 123:2,14 124:20,22  
 204:9 232:8 314:21  
**Division's** 114:22  
**Divisive** 313:4  
**divulge** 372:7  
**Dixon** 2:17 329:11,20  
 334:7,9,9 337:19  
 338:2,4,10 339:4  
**doable** 177:7  
**docket** 81:5  
**document** 30:6 48:21  
 54:18,19 55:1 120:15  
 135:11 158:4 165:18  
 182:20,21 213:18,20  
 217:5 291:14 292:2  
 294:11 443:2  
**documentation** 30:2  
 160:16 180:9 185:8  
 198:9,12  
**documented** 428:15,18  
 431:8  
**documents** 30:5 41:10  
 43:18 52:21 56:17  
 98:19,21 158:5  
 183:18 189:3 195:22  
 196:21 198:14 202:2  
 202:6 207:20 208:2  
 368:21  
**dodecyl** 212:15  
**doing** 27:3,6 50:12 58:7  
 58:8,9 59:15 65:4,6,7  
 65:9 66:6 73:4,5,5,11  
 78:15 113:6 143:8  
 157:10 162:1 164:18  
 178:7,8 198:8 218:11  
 264:12,13,15 268:19  
 268:22 272:9 321:14  
 336:1,5 339:5 353:21  
 361:10,19 383:15  
 409:13,13,18 410:11  
 413:3 417:10 418:7  
 418:16,21 419:3,6  
 425:7,10 448:14,17  
 448:18 458:19 471:15  
 479:7 481:17 496:9  
 497:4,12  
**dollar** 361:2

**dollars** 34:4 92:11  
 170:1 174:7 192:17  
**domestic** 68:1 115:9  
 117:5,10 460:19  
**domestically** 67:8  
 228:5  
**dominated** 296:17  
**door** 405:3 473:12  
**Dosatron** 472:9  
**doses** 250:10 302:8  
**dossiers** 119:15  
**double** 182:11  
**double-digit** 460:6  
**doubt** 191:9  
**dovetails** 361:19  
**downloads** 38:1  
**downtown** 102:6  
**dozens** 131:18 361:2  
**draft** 37:21 174:8 356:4  
 391:19  
**drafted** 82:1  
**drafting** 239:10  
**dramatically** 26:10  
 122:5  
**drawing** 381:7  
**dreams** 353:7  
**dress** 474:8 480:7  
**dressng** 479:19,22  
**drift** 285:9 288:5,5  
**drill** 113:9 114:5  
**drip** 228:19 248:18  
 249:15,18 267:19  
 286:15 479:18  
**dripper** 267:12,19  
**dripping** 423:14  
**Driscoll's** 3:2,8 441:12  
 441:18 443:22 474:15  
 474:18 477:7 489:4  
**drive** 35:19 156:10  
 171:18  
**driven** 52:12 240:12  
 279:1  
**drives** 452:10  
**driving** 35:16 404:6  
**drop** 380:10,15  
**dropping** 266:7  
**drove** 40:20 317:16  
**Dru** 323:19  
**Drug** 134:17  
**drugs** 435:14  
**drum** 232:5  
**dry** 248:16,20 257:14  
 257:17,18 258:14  
 260:2,3 262:20  
 263:12 403:12 452:1  
 452:5  
**dual** 106:18  
**due** 27:6 99:1 121:16

142:8 169:8 205:19  
 297:14  
**dug** 367:10  
**dumping** 393:4  
**duo** 234:3  
**duplications** 80:10  
**Durando** 2:18 105:8,10  
 107:8,13 167:11  
 169:10 175:18 182:12  
 183:8 184:16 185:5  
 186:1,12 187:3  
 189:17 192:20  
**Durango** 334:11  
**duration** 224:21  
**dust** 233:21,22 234:4,4  
 234:22,22 370:1,15  
 370:17 371:5,11  
**duty** 304:10 423:20  
**dwarfed** 450:17  
**dyke** 324:16  
**dynamic** 284:10 478:15  
**dynamics** 285:22  
 481:21  
**dysfunction** 94:13

---

**E**


---

**e** 4:1 400:4 465:2  
**e-file** 154:7  
**eager** 442:7  
**earlier** 30:18 50:14  
 75:19 76:17 95:14  
 96:4 104:9 134:5  
 136:2 137:1 139:10  
 142:2 151:19 156:20  
 171:4 194:1 203:10  
 253:12 411:7 426:4  
**earliest** 92:20 162:9  
**early** 82:2 137:3 169:20  
 216:11 217:17 412:14  
 412:14 432:6 476:15  
 501:15,17  
**earned** 106:18 410:10  
**earnest** 298:17  
**earth** 233:5 282:14  
 283:3,7,19 284:6,9,16  
 284:17 332:19 375:20  
 376:1 395:22 411:17  
 411:19  
**Earth's** 284:5  
**easier** 25:5 93:22 235:1  
 250:17 425:6 449:14  
**easily** 182:5 254:6  
 395:10,11 460:14  
**east** 301:4 498:9  
**Eastern** 27:16  
**easy** 245:15 300:4  
 310:17 326:15 327:5  
 353:8

- eat** 375:22 470:9  
**eaten** 266:12  
**eating** 384:10 387:4  
 459:15  
**eccentric** 269:19  
**echo** 70:12 166:8  
 205:14 254:13  
**eco** 390:5,15  
**eco-system** 349:12  
**ecofarm** 483:15  
**ecological** 349:21  
 352:10 353:14 429:1  
**ecology** 237:7,12 315:4  
**economic** 111:1 128:20  
 233:11 320:18,20  
 327:3 340:18 361:12  
 402:11  
**economically** 278:3  
**economics** 404:10  
**ecosystem** 253:22  
 296:7,11,22 299:8  
 300:3,5 302:20 442:4  
**ecosystems** 253:17  
 254:3 296:2,12,20  
 297:10,12 299:19,21  
 300:8,9,18  
**edits** 398:16  
**educate** 81:14 244:21  
 402:7 421:10  
**educated** 242:6 246:22  
 247:7 401:22  
**education** 11:3 330:17  
 330:17 354:1 393:14  
 401:20,21 406:7  
**educational** 166:13  
 205:20  
**effect** 116:21 216:13  
**effective** 384:5 400:9  
**effectively** 106:2 165:7  
 194:7  
**effectiveness** 435:18  
**effects** 218:21  
**efficacy** 254:14 255:9  
 400:14  
**efficiencies** 40:11  
 475:21  
**efficiency** 35:17 110:8  
 383:20  
**efficient** 39:10 223:10  
 235:2 265:14 340:18  
 383:21  
**effort** 110:5 113:2  
 168:18 332:12 396:16  
**efforts** 23:15 48:22  
 112:13 145:16 168:20  
 239:8 331:2 433:17  
**egg** 114:18,19,20  
 233:10
- eggs** 402:4,5  
**Egypt** 286:6  
**eight** 19:15 33:21 74:11  
 126:8 264:10 310:14  
**eight-** 241:21  
**eight-year** 315:18  
**eighth** 401:10  
**either** 118:21 119:16  
 127:21 135:6,18  
 137:18 202:12 212:11  
 214:3,21 215:11  
 217:2 266:11 295:7,8  
 326:4 497:7  
**Ela** 1:16 9:21,21,21  
 197:3 245:4,9 260:10  
 267:14 276:22 316:11  
 407:4 446:19 447:1  
 447:21 448:3,9  
 453:21 478:11 481:2  
**elaborate** 123:15  
 254:21 404:1  
**election** 8:19  
**electronic** 44:3 158:2,4  
 158:5,7 161:3 184:21  
 185:11  
**electronically** 31:22  
 122:6 123:1 178:2  
 185:8  
**element** 237:13,14  
 252:19 266:4  
**elemental** 232:15 380:2  
 397:17,20 398:1  
 400:21 500:17 501:2  
**elements** 109:6 129:6  
 136:10 254:5 291:5  
**eliminate** 230:20  
 471:22  
**eliminated** 142:7 242:5  
**eliminating** 253:16  
 362:21 435:16  
**elimination** 142:6  
**Eliot** 323:21  
**Elliott** 332:16 333:1,8  
 333:16 385:15  
**eloquently** 394:3  
**elucidate** 316:11  
 317:13 407:13  
**email** 18:13 224:13  
 391:2  
**emails** 71:20  
**embarrassed** 309:8  
**embrace** 35:5 442:7  
 444:5  
**emerged** 27:22  
**emergencies** 397:15  
**emergency** 148:3  
 202:11 396:19 398:4  
**emerging** 164:21
- Emily** 1:17 3:8 11:17  
 67:14 70:4 245:22  
 254:20 269:2 278:20  
 293:6 297:18 304:14  
 312:4,11 318:14  
 328:13 332:22 333:19  
 342:17 352:13 366:12  
 394:20 395:13 398:20  
 399:21 411:22 414:21  
 419:20 423:8 424:13  
 424:17 433:9 441:7,8  
 441:11 461:15 488:21  
 488:21 489:1 498:12  
**Emmaus** 330:11  
**emotional** 362:5  
**empathize** 351:19  
**emphasize** 32:10 39:4  
 68:19 157:14 454:21  
**emphasized** 67:4 85:22  
**emphasizes** 30:6  
**emphatically** 306:11  
**employee** 221:18 222:5  
 222:14,17,22  
**employees** 128:17  
 180:4  
**employing** 154:4  
**employs** 146:12 154:3  
 256:8  
**empower** 239:8 444:9  
**emulsion** 248:18  
 249:20 262:18,22  
 263:3  
**enabling** 160:15  
**enclosed** 232:5  
**enclosure** 449:18  
**encompassed** 182:20  
**encounter** 250:12  
**encountered** 475:13  
**encourage** 38:19  
 100:22 102:22 182:15  
 226:3 237:15 269:6  
 366:20 368:20 463:14  
 477:2 494:14  
**encouraged** 241:22  
**encourages** 463:17  
**encouraging** 369:16  
 400:20  
**ended** 22:10 133:1  
 346:7,15  
**endorse** 405:19  
**ends** 405:2  
**endured** 450:13  
**energy** 229:14 276:5  
 473:6 491:21 492:4  
**enforce** 33:10,15  
 129:11 186:15 190:1  
 197:11 329:6 336:15  
 357:13 365:18 366:10
- 366:21  
**enforceable** 320:13  
 367:20  
**enforced** 443:6  
**enforcement** 13:18  
 21:18,21 22:9,19  
 23:14,22 25:7,13,19  
 26:17 28:4,10 30:19  
 32:10,16 33:2,3 36:2  
 44:15 62:20 73:9,20  
 77:11 106:3 121:3  
 124:6 128:13 129:20  
 131:21 133:6 180:16  
 195:12 204:11 205:4  
 365:21 442:21 443:9  
**enforces** 26:22 44:17  
**enforcing** 115:11 130:5  
 135:1 366:3  
**engage** 154:7 163:17  
**engaged** 31:6 94:15  
 96:6 149:2  
**engagement** 15:1 35:1  
 96:17 140:6,12  
**engine** 134:12  
**engineer** 264:6 488:1  
**engineered** 145:14  
**engineering** 487:22  
**England** 3:8 322:20  
 389:11 421:22  
**enhance** 40:10  
**enhancements** 112:5,9  
 133:14 134:3 139:8  
**enhances** 429:2  
**enjoy** 95:10  
**enjoying** 7:17  
**enlighten** 189:15  
**enormous** 14:10  
**ensure** 46:10 54:5  
 113:7 120:3 137:15  
 143:1 165:14 202:7  
 252:18 434:3  
**ensures** 299:20  
**ensuring** 28:7 119:1  
 124:12 165:11 172:1  
 193:15 421:19  
**entails** 93:6  
**enter** 47:17 116:9  
 122:12 149:6 161:7  
 186:7  
**entered** 43:20 82:2  
 119:20 185:9  
**entering** 21:16 28:8  
 43:2,4,18,19 45:4  
 46:16 187:18  
**entertained** 84:14  
**entire** 76:13 178:13  
 199:15 341:14 356:6  
 356:6 372:15

- entirely** 255:4 448:5  
**entirety** 430:21  
**entities** 55:14 114:9,21  
115:13 167:22 199:13  
199:14  
**entitled** 302:6,6  
**entity** 62:4,12 112:1  
113:3 119:22 194:2  
199:6 205:5  
**entries** 118:4 120:18  
121:16 124:1,3 127:9  
127:10 142:10 199:5  
**entry** 41:11,13 44:17,18  
46:13 49:2 117:9  
118:7,9 121:5,20  
129:15 130:10 131:22  
132:18,19 134:16  
136:12 138:11 147:8  
147:13 149:13 150:10  
150:14,17,18 152:2,7  
153:7 154:13,22  
158:20 180:6 183:19  
195:18 196:5,21  
199:8 200:5,16  
202:16,22 203:8  
204:11  
**enumerated** 428:10  
**environment** 43:15  
110:3 132:7 133:11  
141:11 250:16 257:3  
284:3 324:1 330:21  
344:7 402:14 408:7  
464:14 482:22 491:2  
500:14,15  
**environmental** 9:16  
37:17 106:17 134:10  
335:11,15 338:13  
421:8 441:21 468:22  
**environmentalism**  
334:22  
**Environmentalism** 12:2  
**environmentalists**  
97:15  
**environmentally**  
232:15 442:9 443:21  
**environments** 80:7  
197:5  
**envisioning** 162:10  
**envy** 390:2  
**eons** 396:1 419:10  
**EPA** 82:16,17,18 83:4  
83:12,21 84:7,17  
86:18 87:5 369:12  
**epiphytes** 275:21  
**equal** 353:6  
**equality** 353:11  
**equation** 301:20 345:11  
**equivalence** 42:20
- equivalencies** 173:14  
**equivalency** 32:22 41:7  
42:7 43:7 45:4 50:10  
50:21 51:3 62:3,7  
69:14 159:12 174:15  
281:4,7,13  
**equivalent** 69:1 188:16  
**eradication** 148:2  
**ergothionein** 382:22  
**ericaceous** 498:10  
**erode** 410:22  
**erodes** 376:18  
**error** 418:13  
**errors** 158:13  
**ERS** 188:11  
**especially** 81:13 95:16  
167:2 178:22 190:22  
249:11 254:16 295:20  
331:20 426:6 434:10  
459:18 480:21 482:22  
493:6 500:8  
**essence** 110:21 117:6  
120:6 121:4 182:15  
**essential** 20:10 133:4  
133:20 237:8 252:19  
362:15 369:2 379:3  
435:1 437:5 438:14  
439:2,5 443:20  
**essentiality** 434:19  
**essentially** 170:12  
284:15 291:4 306:17  
341:9 467:1  
**establish** 38:21  
**established** 41:17  
215:8  
**establishing** 50:2  
**Esteban** 3:5 255:18  
264:1,2,6  
**et** 66:17,17 80:2  
**etcetera** 247:4  
**ETDE** 158:4,6  
**ethics** 99:13 450:8  
**Ethiopian** 213:6  
**Etka** 269:18  
**EU** 2:12 42:21 43:1,2  
46:2 158:10 274:3,16  
275:3 312:17 357:8  
434:18 438:10  
**Europe** 276:8 277:10  
280:16 281:8 287:8  
289:4,8,13 437:7,9  
439:13  
**European** 27:16 42:21  
274:17 275:2,9,16  
276:4,7 279:3,16  
280:21 281:3,15,18  
437:4,18,19 439:8  
456:11
- Europeans** 289:6  
**evaluate** 41:2 142:21  
207:7 369:1 373:4  
**evaluated** 76:3 82:21  
**evaluation** 114:4  
165:12,19 192:18  
207:19  
**evaluations** 165:10  
**evening** 433:10 441:10  
458:9  
**event** 102:6,18  
**events** 147:3  
**eventually** 201:5 317:2  
317:8 319:8,22 321:4  
**everybody** 61:10 66:6  
78:3 103:9 107:13  
206:16 240:13 249:13  
308:15 335:18 392:20  
410:9 458:9 467:13  
501:19  
**everybody's** 168:10  
392:13  
**evidence** 23:16 24:1  
30:22 32:13,21 33:11  
62:7 75:20 77:13,19  
**evident** 459:12 461:2  
**evolve** 140:21  
**evolved** 395:22  
**evolving** 78:22 283:22  
**ex-NOSB** 313:13  
**exact** 447:14  
**exactly** 142:20 177:4  
273:15 349:20 350:5  
372:5 375:2 426:1  
462:11,13 493:4  
496:1  
**example** 25:13 28:4  
36:5,12 56:19 64:10  
65:1 71:18 72:21  
93:19 113:3 117:15  
128:1 135:13 157:19  
161:6 178:6,10,15  
239:22,22 248:18  
380:9,11 388:10  
437:7 438:16 489:20  
**examples** 29:21 35:21  
40:14  
**exceed** 482:19  
**exceeding** 314:20  
**Excellence** 463:9  
**excellent** 131:7 221:10  
**exception** 211:2 233:3  
**exceptions** 275:20  
282:10  
**excess** 393:17 445:9  
492:4  
**excited** 104:22  
**excitement** 283:11
- exciting** 308:22  
**exclude** 379:14  
**excluded** 252:6 288:4  
290:6,22 294:13  
435:4,7  
**exclusion** 93:19  
**exclusively** 259:4  
298:10 306:9  
**excuse** 133:10 232:18  
464:19  
**executed** 48:21  
**executing** 112:7  
**execution** 176:13  
290:18  
**executive** 11:2 80:18  
88:1,3,18,20 91:2,3  
112:3 133:8 137:1  
140:12 168:1 251:11  
282:20 374:14 382:8  
463:8  
**exempt** 187:10 315:13  
435:5  
**exempted** 236:7  
**exemption** 281:7  
485:14  
**exercise** 334:16  
**exist** 142:22 315:12  
**existence** 139:11  
**existing** 29:22 41:16  
58:5 158:3 159:16  
163:13,18 391:6  
**exists** 99:15 132:13  
**exoskeletons** 233:4  
**expand** 21:10 175:6  
218:21 304:22  
**expanded** 159:15  
**expanding** 45:5,8  
157:17 173:14  
**expands** 310:14  
**expansive** 480:3  
**expect** 243:10,12 295:8  
350:13 376:7 402:15  
402:17 410:20 415:14  
434:12  
**expectations** 359:6  
434:4  
**expected** 97:18  
**expecting** 165:20  
459:16 487:9 488:5  
**expense** 274:20  
**expensive** 248:20  
316:3 318:13  
**experience** 6:22 89:2  
106:12 109:3 176:15  
201:9 205:20 256:11  
256:18 378:22  
**experienced** 256:13  
364:13

**experiencing** 26:6  
**expert** 97:19 103:8  
 400:14 445:20  
**experts** 8:5 67:19  
 103:17 192:6 464:10  
**expiring** 221:8  
**explain** 19:19 45:17  
 147:3 149:22 223:9  
 336:9 355:6 404:9  
 440:9,10  
**explaining** 470:6  
**explains** 29:17  
**explicit** 138:4  
**exploit** 28:16  
**explore** 56:7 81:7 160:9  
**exploring** 31:9,21 55:15  
 177:12  
**export** 31:20 39:18 48:1  
 48:10 117:13 157:19  
 157:21 158:2,9 160:5  
**exporter** 121:8 123:18  
 125:6  
**exporting** 158:8  
**exports** 188:12,16  
**exposure** 475:18  
**express** 39:2 271:5  
 290:8 384:9  
**expressed** 278:11  
 397:7  
**expressing** 98:6  
**extend** 15:13  
**extending** 220:18  
**Extension** 417:11  
**extensive** 6:21 413:12  
**extensively** 387:13  
**extent** 139:5 204:7  
**external** 140:12 370:6  
 397:18  
**extra** 62:10 265:2 278:3  
**extract** 497:19  
**extracted** 219:2 229:15  
 230:2,14 231:1  
 316:19 347:4  
**extraction** 229:13  
 230:19  
**extracts** 229:6  
**extraordinary** 35:4  
**extrapolate** 189:21  
**extremely** 28:7 490:3  
**extremes** 249:4  
**exudate** 479:6 481:16  
**eye** 25:14 234:11,16  
 394:1 395:19  
**eyes** 234:13 309:14

---

**F**


---

**fabulous** 34:19  
**face** 87:14 93:8

**faced** 411:18  
**facilitate** 229:2,7 384:8  
**facilitating** 154:14  
**facilities** 360:21 466:9  
 469:2  
**facility** 317:8 463:22  
**facing** 132:14 340:1  
 429:18  
**fact** 57:11 74:8 75:15  
 77:14 101:19 152:21  
 168:12 197:12 205:5  
 218:19 230:4,13  
 273:8 302:13 325:4  
 343:1 400:8 401:21  
 438:16 440:10 465:18  
 469:8,9 471:15,21  
 472:3 473:9  
**facto** 184:16 185:3  
 487:8  
**factor** 171:17 317:19  
**factors** 238:11,13  
 243:13 317:16  
**facts** 302:7 394:2  
**faculty** 10:3  
**failed** 410:3  
**failing** 332:13  
**fails** 320:19 344:14  
 434:18  
**failure** 336:14 365:12  
 365:18  
**failures** 336:17  
**fair** 184:22 311:14,16  
**fairer** 433:15  
**fairly** 382:16  
**faith** 373:12  
**fall** 1:5 5:6 133:18  
 134:20 369:8 491:18  
**fallacies** 479:1  
**falls** 132:7 134:14 265:7  
 407:16  
**false** 302:5  
**falsification** 160:15  
**falsifying** 72:6  
**familiar** 16:8 87:14  
 404:18 407:20 461:17  
 498:9  
**familiarity** 210:12  
 380:11  
**familiarize** 330:13  
**familiarizing** 81:1  
**families** 362:4 411:8  
**family** 9:21 96:11,12,13  
 97:2 313:22 314:4  
 361:13 363:18 392:8  
 401:14 405:3 408:6  
 408:10 449:9 470:9  
 498:11  
**family's** 405:2

**family-owned** 256:7  
**famous** 283:8 309:10  
 309:20  
**fans** 473:7  
**far** 92:17 93:9,15 131:6  
 168:15 176:6,10  
 259:4 312:16 332:3  
 393:8,14 429:10  
 431:4 436:13 448:5  
 467:18  
**farewell** 391:2  
**farm** 2:9,13,13,15,15,21  
 2:22 3:8,10 10:14  
 11:18 34:3 39:8 76:5  
 76:13 160:20 164:10  
 228:3 241:16 242:21  
 243:14 246:5 254:2  
 255:3 273:16 285:22  
 286:7,20 288:2,16,17  
 295:13 297:21 298:9  
 302:21 303:19 309:1  
 313:21 321:2 323:4  
 334:11 339:3,6  
 363:18,22 389:6,20  
 392:9,9 393:9 395:2,4  
 409:10,11 412:9,22  
 416:21,22 417:8  
 418:18,19 420:14  
 425:17 426:12,15  
 427:10 449:7,11,15  
 449:18,18 458:12,15  
 463:12,17 464:9,11  
 465:1 492:10 500:2  
**farm's** 459:9  
**farmed** 351:19  
**farmer** 2:19 12:1 71:21  
 72:1,2 106:7,9 113:14  
 144:5,7,10 161:6  
 169:11 177:16,18,20  
 179:11,11 181:5  
 183:14 184:4 190:20  
 195:15 196:12,18  
 202:9 203:11,22  
 228:3 241:21 245:19  
 282:21 306:6 309:1  
 330:6,10 332:4,16  
 338:4,7 361:11  
 363:18 364:13 382:9  
 389:14 394:13 409:15  
 415:10 416:17 417:2  
 450:16 463:7 464:4  
 464:19  
**farmer-driven** 322:21  
**farmers** 3:9 11:21 26:15  
 77:6,16 92:12 94:18  
 97:14 229:4 274:1,4  
 288:15 304:5 322:10  
 322:14,21 323:1,13

323:14,20 324:22  
 325:6 335:1,20  
 336:21 338:11 348:10  
 348:11,15 349:17  
 351:13,18 352:15,16  
 353:11,15 354:8  
 358:12,17 361:13  
 363:9 375:5,10  
 376:10,15,20 378:8  
 379:1 383:4 384:13  
 389:11 391:17 408:11  
 410:16 415:20 417:4  
 421:3,17 422:1  
 427:14 429:18 442:4  
 450:14 455:21 462:4  
 463:17,17 477:14  
**farmers'** 361:11 420:18  
 427:13 444:9 458:14  
 459:10  
**farming** 243:9 261:3  
 262:1 276:10 285:20  
 286:1 301:7,9,16  
 307:16 308:2 324:1  
 330:17 331:2,21  
 332:1 336:10,20  
 337:4 348:1 353:13  
 363:22 364:21 383:7  
 386:1,4 390:14  
 409:14 410:12 411:15  
 420:15 421:1 449:6  
 460:22 461:5 464:6  
 476:11 477:12,18  
**farmland** 383:21 390:11  
**farms** 2:9,10,10,17 3:9  
 9:21 33:19 37:1 96:22  
 230:21 288:6 301:3,5  
 313:12,12 314:17  
 325:20 327:18 335:5  
 339:1,2 390:17 404:5  
 408:6,10 458:11,22  
 462:5  
**fashion** 50:12 123:2  
**fast** 195:3  
**faster** 67:10 73:8 422:9  
**fastest** 410:7  
**father** 102:10 286:19  
 417:3,18  
**fatty** 74:15 208:17  
**FAVIR** 152:5  
**favor** 85:5 242:4 308:4  
 355:13  
**favorite** 424:4  
**fax** 119:22  
**faxes** 120:10  
**Fayetteville** 10:12  
**FDA** 138:10 154:3  
**feared** 421:21  
**fearful** 329:5

- feasibility** 31:4 315:18  
**feature** 37:6  
**February** 133:9 294:2  
 472:22  
**fed** 238:19  
**federal** 2:7 5:16 8:6  
 22:6 28:4,10 31:7  
 37:8 47:5 88:15 90:18  
 93:4 97:8 103:18  
 104:20 105:1,12,16  
 106:22 110:18 119:2  
 119:2 130:20,22  
 132:2,14 133:12  
 134:6 135:4 137:7  
 140:8 155:9 157:2  
 161:19 162:2 166:9  
 169:5,9 205:15  
 421:16 435:13  
**federalized** 162:3  
**FedEx** 194:15  
**feed** 66:5 76:19 158:22  
 238:18,19 242:15,18  
 256:22 301:10,10  
 302:8 310:20,21  
 311:18 319:18 320:6  
 342:20 343:9,19,20  
 344:17 368:12 370:5  
 370:20,21 371:1  
 376:16 384:1,1 388:3  
 388:9 395:7 453:13  
 469:13  
**feedback** 20:6 30:17  
 34:22 51:12 64:21  
 65:5 66:5 78:5 178:5  
 182:11 219:20 459:11  
**feeding** 236:1,4 257:8  
 318:1,10 377:6 395:2  
 451:8 453:14 454:4  
 466:18  
**feeds** 259:1 333:4  
**feel** 96:11 247:1 271:15  
 297:22 298:7 318:21  
 350:14 353:18,19  
 436:12  
**feeling** 272:14  
**feels** 306:12  
**fees** 147:13  
**feet** 304:7  
**fellow** 96:10 106:5  
 332:16  
**felt** 345:10,12 429:10  
 454:2  
**feminism** 353:4  
**feminist** 353:10  
**fertilities** 494:8  
**fertility** 236:10,22 242:3  
 242:21 243:18 246:2  
 246:4,10 261:16  
 349:18 356:11,13  
 377:1,6 413:4 419:8  
 423:12 425:18 426:1  
 428:2 466:17 476:4  
 477:19 478:14 480:7  
 490:12 493:1,20  
 494:3  
**fertilization** 475:15  
 476:18 477:4  
**fertilize** 243:16 245:9  
 422:22 424:2  
**fertilizer** 256:16,17  
 257:15,15,18,20  
 258:14,15,19,21  
 259:1,3 265:12,14,18  
 266:9 302:22 312:1  
 316:12 363:1 424:3  
 471:17 494:15,17  
 495:1  
**fertilizers** 228:20  
 246:21 257:16,17  
 258:1,9 259:18,20  
 260:2,4 262:8,20  
 263:12  
**fertilizing** 423:4  
**fewer** 74:13 302:22  
**fiber** 316:18  
**fide** 350:4 429:17  
**field** 68:14 128:18  
 249:10 257:12,17,19  
 258:15,18,20 259:5,8  
 260:5 261:1,4 268:2  
 305:12 367:9 370:4  
 372:2 413:8,11 414:8  
 462:7 481:10,18  
 482:2,4 483:9 484:18  
 492:19  
**fields** 76:6 185:9  
 189:14 233:21 235:13  
 248:1 265:8 285:11  
 447:13,13 476:21  
 483:14,17  
**Fifteen** 110:13  
**fifth** 6:16  
**Fifty-two** 15:6  
**fight** 362:6 383:16  
 410:1  
**figure** 44:6 150:14  
 176:4,9 181:15  
 191:21 299:11 343:19  
 405:9  
**figured** 68:13 174:11  
**figures** 22:8  
**figuring** 142:18  
**file** 132:18,18 141:12  
 194:21  
**filed** 142:9 355:3  
**files** 120:16 124:14  
**filing** 119:13 122:6,7  
**fill** 10:22 59:21 384:2  
**filled** 5:18 59:22 185:9  
**fills** 455:3  
**film** 216:9 423:18  
**final** 13:17 19:13 20:6  
 25:16 27:13 50:7 52:4  
 56:1 125:4,17 184:9  
 186:18 276:1 368:18  
**finalized** 128:5  
**finally** 6:14 18:8 24:18  
 36:16 50:19 85:21  
 106:22 108:20 109:4  
 128:12 165:5 345:14  
 369:11 398:2 436:1  
**financial** 315:1  
**financially** 246:17  
**find** 77:19 79:1 83:14  
 93:8 103:1 143:13  
 156:9 248:19 253:9  
 299:11 336:21 342:14  
 344:15 367:2,14  
 391:2 399:19 403:8  
 417:18 438:16 454:9  
 492:19 495:3  
**finding** 50:8 87:17  
 103:16 404:3  
**findings** 40:5,17 41:6  
 41:19 51:7,15 53:17  
 54:1 56:15 57:6 63:13  
 63:14  
**finds** 47:14,15  
**fines** 193:13  
**finger** 324:15  
**finish** 8:17 126:12  
 182:12 225:8 391:10  
**finished** 158:16 212:19  
 232:17 364:6 412:11  
**Finishing** 10:4  
**Finland** 275:13  
**fire** 92:8 461:10  
**firm** 371:13  
**firs** 309:19  
**first** 5:12 9:19 10:1,4  
 13:13 14:7 22:11 26:3  
 34:5 40:1 42:2,18  
 44:12 50:9 63:21 70:6  
 70:6 78:8 87:9 92:4  
 97:4 102:2 105:7  
 106:19 107:7 108:8  
 112:16 136:17 157:12  
 159:10,21 160:2,8  
 163:1 166:13 167:1  
 173:17 199:21 206:12  
 214:18 222:3 224:20  
 227:4,10 233:16,18  
 238:16 256:13 257:14  
 260:6,9 264:15  
 283:13 290:8 296:6  
 296:18 323:8 326:7  
 329:11,19 330:10  
 335:21 339:17 343:5  
 361:21 382:18 390:4  
 392:16 396:21 404:12  
 428:22 432:20 449:13  
 455:15 458:18 459:2  
 464:22 483:19 484:15  
 488:16  
**first-** 336:15  
**first-graders** 326:8  
 328:3  
**firstly** 274:11  
**fiscal** 22:9  
**fish** 138:10 146:3  
 248:17 249:19 262:18  
 262:22 263:3 265:19  
 267:1,11 317:4 426:7  
 466:18,18,19 467:8  
 469:1 471:20 472:1  
**fishes** 467:6  
**fit** 16:10 80:3 127:4  
 159:22 183:6 270:22  
**fits** 318:19  
**five** 7:1 18:14 34:4 56:4  
 75:16 88:19 102:19  
 114:9 115:13 189:7  
 276:6 325:14 329:9  
 430:17 436:21  
**five-minute** 325:12  
**fix** 34:16 295:20  
**fixated** 422:17  
**fixes** 170:8  
**flags** 123:9  
**flavor** 317:18 357:1  
**flesh** 398:6  
**flip** 98:1  
**floating** 222:3 321:5  
**flocculents** 467:11  
**floor** 166:17  
**flor** 98:1  
**Florida** 1:8,9 33:22  
 47:12,15,17 92:5,7  
 117:17 148:7 301:5  
 408:4  
**Florida's** 7:17  
**flow** 178:12 204:16  
 473:1  
**flowability** 232:11  
**flowers** 153:12  
**flows** 39:10 301:17  
**fluctuation** 486:9  
**flux** 486:10  
**fly** 148:6  
**FMSA** 468:20  
**focus** 6:9 21:20 23:14  
 29:11 105:22 112:15

113:10 224:15 237:10  
 252:14 297:7 301:11  
 331:2 340:17 341:14  
 432:10 441:16  
**focused** 27:15 170:12  
 203:15 352:5 401:20  
 460:5 474:19  
**focuses** 112:4 164:1  
 302:19  
**focusing** 24:1 131:1  
 242:2 252:12 407:19  
**foggy** 432:5  
**folks** 15:4 17:7 19:4  
 20:20 37:7 42:16  
 52:22 66:22 72:21  
 84:20 86:5,7 91:5  
 94:4 95:17 100:10  
 102:8 110:18 126:17  
 188:21 194:14 226:7  
 244:12 311:1 325:21  
 350:18,20 351:10  
 356:9 361:17 381:15  
 381:20 383:13 470:4  
**folks'** 192:9  
**follow** 56:14 67:13,22  
 209:6 214:13 277:1  
 315:6 373:22 405:14  
 447:6 453:22  
**followed** 227:11 231:6  
 235:7 241:12 251:6  
 255:14,18 264:2  
 268:6 273:20 282:17  
 289:18 295:11 300:22  
 308:18 313:8 322:2  
 329:11,19 334:7  
 339:12 347:18 354:12  
 363:13 367:22 374:10  
 377:14 382:5 392:5  
 396:6 401:6 409:5  
 416:7 417:3 420:10  
 427:5 441:7 448:21  
 458:3 470:18  
**following** 31:2 53:17  
 213:21 216:2 217:14  
 389:2 393:8 447:14  
 496:13  
**follows** 17:3 302:12  
**food** 97:12 113:16  
 127:22 134:17 145:18  
 214:11 215:8 230:6  
 242:14,15 247:13  
 256:15 330:20 332:7  
 332:8,10 340:9,12  
 341:6,8 342:6,22  
 343:8,9 345:1,4  
 361:22 362:3,11  
 375:6,7,17,22 376:3,8  
 376:13,14 377:4

380:17 387:3 389:8  
 410:8,19,20 421:13  
 433:18,19,20 442:2,9  
 444:10 455:8 456:2  
 459:1,16,19 460:21  
 461:1 463:15,18  
 464:11,15,16 465:19  
 465:20 466:10,18  
 467:12 468:19 469:12  
**foods** 32:12 79:20  
 207:10 268:13 325:3  
 356:21 362:19 365:7  
 378:3 390:22 434:11  
 434:12 443:13,15  
**foot** 211:22  
**footing** 391:14  
**footprint** 421:8 445:6,7  
 445:8,9 466:14 473:3  
 473:12,14,15,19  
**forage** 455:4,11  
**foraging** 454:14  
**forbidden** 275:7  
**force** 309:4  
**forces** 476:5  
**forefront** 278:10  
**forego** 99:22  
**foreign** 30:10 41:8  
 113:21 114:5  
**Forest** 106:14  
**forested** 390:7  
**Forestry** 106:17  
**forethought** 246:16  
**forget** 353:9  
**forgive** 470:4  
**form** 20:12 44:6 58:5,6  
 135:14 187:7 202:13  
 202:13 203:2 213:3  
 233:21 252:6 304:17  
 306:21 397:6 399:13  
 424:6 445:14 452:20  
 484:2 488:6 496:12  
**formal** 223:5 239:10  
 355:3 370:13  
**formalities** 7:22  
**formality** 100:1  
**formalize** 223:9  
**formalized** 281:10,11  
**formally** 7:3  
**format** 116:2  
**formed** 286:20 361:8  
**former** 15:17 354:17  
**forms** 58:14 135:9  
 136:3,10 142:8  
 496:19  
**formula** 236:14 355:2  
**formulated** 370:15  
**formulation** 372:16  
 437:11,12

**formulations** 372:4  
 373:7  
**forth** 116:7 208:14  
 211:7 321:13 376:15  
 443:12  
**fortification** 228:12  
**forums** 20:4  
**forward** 15:12 66:20  
 79:17,22 81:1 84:3  
 95:20 108:21 109:9  
 130:15 141:21 143:11  
 153:16 162:11 167:20  
 182:17 183:3 191:10  
 205:21 210:15 220:9  
 221:9 225:17 235:20  
 244:3 334:13 340:20  
 410:3 411:13 432:9  
**forward-looking** 289:5  
**forwarded** 345:20,21  
**fossil** 229:14 331:16  
 341:1,2 408:7 445:13  
**foster** 356:12 376:22  
 428:2  
**fostering** 356:11  
 444:12  
**fought** 415:19  
**found** 14:3 23:5 42:10  
 54:22 58:3 74:16  
 152:11 179:16 195:20  
 237:12 266:4 301:18  
 362:16 387:1 399:16  
 434:7 435:11 438:19  
**foundation** 251:12  
 269:12 270:13 271:2  
 284:17,19,20 285:1  
 342:8 350:8 365:10  
**foundational** 345:12  
**founded** 313:22 458:15  
 458:22  
**Founder** 374:14  
**founding** 301:8 461:5  
**four** 41:6,15,19 82:17  
 105:6 107:10 113:11  
 120:14 126:11 194:13  
 206:21 296:14 299:19  
 300:2 339:6 401:22  
 431:15 462:19 474:22  
 482:8,10,18 483:11  
**fourth** 325:20 326:4  
 463:6  
**foyer** 100:14  
**fraction** 253:6 481:6  
 486:15  
**fragile** 284:18  
**frame** 51:3 150:4  
 173:16 431:7  
**frames** 173:16 345:6  
**framework** 76:21 82:19

161:2 163:10,11,13  
 376:10  
**Frances** 173:11  
**Francis** 1:19 6:15,15,20  
 7:6 11:22 67:14 73:17  
 75:8 78:5 166:21  
 177:10 280:4 282:7  
 379:16 385:13 387:19  
 401:11 487:5  
**Francis's** 70:9,11  
**frankly** 181:17 271:1  
**Frasch** 231:15,17  
**fraud** 186:20  
**fraudulent** 25:4 30:20  
 31:1 46:15,21 104:11  
 197:11 240:3  
**fraudulently** 104:7  
**Fred** 3:4 334:7 339:12  
 339:12,15 342:16  
 347:14,16  
**free** 37:13 350:14 402:4  
 434:12  
**freeway** 299:16  
**freight** 119:17  
**frequency** 41:18  
**frequent** 56:8,14  
**frequently** 25:8 139:4  
 456:17  
**fresh** 268:1 354:17  
**Fresh2o** 3:11 256:1,5  
 256:21  
 **freshest** 257:1  
**Fresno** 9:19  
**friend** 364:8 451:15  
**friends** 307:15 309:5  
 311:11  
**fringe** 93:10 390:18  
**front** 7:5 23:12 72:9  
 174:4 190:5 325:20  
 478:20  
**Frontier** 380:2  
**fruit** 3:10 47:11,22 48:8  
 148:6 152:4 154:19  
 407:21 427:9 458:14  
 491:13,18,22 492:5  
**fruit/vegetable** 190:4  
**fruits** 105:17 154:1  
 181:18 190:7 362:16  
**frustrated** 289:2  
**frustrating** 335:17  
 336:8  
**FSIS** 113:16  
**FSMA** 463:17  
**fuel** 229:20 230:1,2  
 445:14  
**fuels** 229:14 331:16  
 341:1 408:7  
**fulfill** 171:15

**fulfilled** 123:10  
**fulfilling** 160:20  
**full** 11:19 34:11 56:22  
 74:3 122:3 123:7  
 128:12 150:11 164:6  
 169:2 198:21 207:2  
 207:22 208:15 209:17  
 211:9 214:9 215:6  
 256:8 327:17 328:2  
 372:15,16 471:20  
 483:6,8,21  
**Fullmer** 2:20 273:20  
 282:17,18,19 285:14  
 286:9,17 288:1  
 289:13  
**fully** 41:9 300:13,14  
 329:6 345:15 388:1  
 460:15 468:11,11  
 479:8  
**fumigated** 41:13 47:16  
 48:5,14,17 49:9,16,17  
 60:13 179:2  
**fumigation** 47:4,21  
 48:12 60:11 151:14  
 184:1  
**fun** 310:8  
**functional** 218:21  
**functionality** 133:3  
 135:12 141:2,8,22  
**functionally** 228:7  
**functions** 133:4,21  
 308:11  
**fund** 147:12 171:10  
 204:3  
**fundamental** 279:14  
 336:9  
**fundamentally** 338:15  
**funded** 160:6  
**funders** 269:21 270:1  
**funding** 34:3 93:14  
 129:18 139:9 170:11  
 269:15  
**fungus** 452:17  
**fungus** 383:1  
**furrow** 447:10,20 480:4  
 497:8  
**furrows** 485:9  
**further** 31:17 63:6 85:6  
 121:8 127:5 226:2  
 232:6,7 239:11 241:8  
 282:4 292:12,15  
 312:2 317:14 354:6  
 438:3 465:9 477:9  
**future** 32:4 39:19 47:1  
 133:17 141:21 145:7  
 153:12 159:13 206:20  
 210:2 211:16 217:3  
 257:1 304:8,12

340:21 342:1,14  
 343:8 347:3,9 349:19  
 350:8 354:3 375:8,18  
 376:1 411:13 418:3  
 461:13 464:1,2  
 466:10 477:10,14  
**futures** 466:9  
**FY** 24:20

## G

**Gaia** 283:18 284:2  
**gain** 149:4  
**game** 32:15  
**games** 310:8  
**gamut** 191:6  
**gap** 69:8  
**gas** 212:15  
**gases** 445:13  
**gather** 46:15  
**gathering** 362:7  
**gearing** 195:3  
**gears** 143:21  
**gellan** 219:4  
**gender** 188:20  
**general** 4:7 39:22 40:2  
 100:4 132:3 176:4  
 177:8 200:2 219:22  
 279:18 327:10 351:7  
 370:11 397:11 473:1  
**General's** 13:22  
**generalized** 87:20  
**generally** 42:5 55:16  
 88:8,22 89:14 91:14  
 214:16 329:3 371:1  
 426:5  
**generate** 37:16,22 46:8  
 65:5 122:7,16 159:9  
 159:11 197:7 465:21  
**generated** 37:11  
**generates** 124:19  
**generating** 285:21  
**generation** 212:14  
 301:3 304:4 306:7,8  
 314:3 352:4 408:17  
 408:18 463:6  
**generation's** 351:3  
**generational** 306:5  
 408:18  
**generations** 304:12  
 349:17 375:15 401:22  
 408:19 418:3 459:14  
 477:14  
**generations'** 353:4  
**generic** 115:8 204:4  
**generously** 103:2  
**genetic** 93:21  
**genetically** 145:14  
 287:9,16,19,21 289:2

289:10 355:1  
**gentlemen** 235:11  
**geographic** 491:10,13  
**Georgia** 3:5 231:13  
 301:6  
**Gerald** 2:17 308:19  
 313:8,11  
**Germany** 286:10  
**germinating** 451:2  
**Gerritsen** 2:21 325:11  
 329:10 354:12 363:13  
 363:17,17,21 366:16  
 367:16  
**getting** 8:8 73:7 76:5  
 103:16 116:15 118:8  
 123:4,7 130:20 145:6  
 201:13 224:13 263:18  
 272:15 352:16 392:13  
 424:4 460:12 473:10  
 481:19 490:6  
**ghostly** 102:9  
**giant** 356:16  
**GIPSA** 145:5  
**give** 6:2,6,11 13:15,20  
 14:17 18:12 71:18  
 118:15 119:6 130:18  
 164:22 165:3 176:17  
 188:5 193:11 200:3  
 206:17 218:2,10  
 226:7 253:5 257:12  
 259:8 274:10 295:17  
 318:17 327:8 329:8  
 348:9 357:3 360:11  
 360:16 380:9,11  
 385:21 394:22 400:21  
 422:22 496:6  
**given** 99:21 142:10  
 161:20 163:7 168:11  
 197:4 202:18 226:4  
 227:8 347:16 391:9  
 400:7 409:19 410:18  
 416:12 421:15 437:13  
 445:12 466:4,4 477:6  
**gives** 49:9 128:12  
 140:15,17 143:11  
 454:11  
**giving** 365:5 372:22  
**glad** 324:11  
**glance** 163:19  
**Glasgow** 19:8  
**glass** 361:3  
**global** 162:6 304:5  
 378:1  
**glycinate** 210:9  
**glycolic** 211:17 221:2  
**GMO** 312:8  
**GMO's** 392:19  
**GMOs** 93:19 246:21

288:4  
**goal** 41:2 53:4 136:21  
 142:18 159:10 160:20  
 185:2,5,12 192:13,18  
 256:22 277:7 290:12  
 441:2  
**goals** 272:1 316:8  
 353:7  
**goats** 286:21  
**gold** 243:5  
**goodies** 222:2  
**goods** 113:1 134:8  
 138:2  
**Google** 88:11 382:21  
**gosh** 329:4  
**gotten** 16:19 29:5  
 163:19 247:15 248:21  
 374:19  
**govern** 33:10  
**governance** 111:15  
 112:2 139:10 161:1  
 164:20 167:22  
**government** 32:18  
 106:1 108:12 110:11  
 110:15,17,19 112:20  
 119:10 132:2,15,20  
 133:5 135:4 136:18  
 139:1 140:14 142:12  
 142:16 143:2 162:17  
 163:6,8,20 168:9  
 169:5 178:18 179:5  
 223:17 299:15 421:16  
 463:18  
**government-to-gove...**  
 154:10,12 191:7  
**governmental** 421:14  
**grab** 70:1  
**grace** 304:3  
**grade** 115:7 117:4,18  
 388:18 393:13  
**graduate** 106:15  
**grain** 36:13 66:13,13  
 145:5 180:8 189:9  
 414:5  
**grains** 28:8  
**grandfather** 416:21  
**granted** 353:17  
**granular** 53:3  
**grapefruit** 117:15,17,17  
 117:21 124:15  
**grapes** 117:1  
**grasp** 371:13  
**grass** 384:10  
**grass-fed** 402:6  
**grateful** 6:10 7:2 35:1  
 223:22  
**grave** 331:5  
**gravitate** 195:7

**gravity** 473:1  
**grazed** 296:8,9,9  
**grazing** 74:1,14 77:3,4  
 77:15  
**greater** 80:3 191:8  
 349:8  
**greatest** 63:22 188:22  
 304:4  
**greatly** 77:7  
**green** 225:2 314:14  
 384:10 413:12,13  
**greenhouse** 241:18  
 245:5 250:4,18 256:9  
 256:11 258:4 277:17  
 278:14,19 279:12  
 313:14 315:15,19  
 316:12 412:2,4,13,18  
 413:8,17,18 419:14  
 422:13,20 426:20  
 427:1 429:7 432:12  
 445:13 471:20 473:6  
 491:22  
**greenhouses** 235:14  
 248:8 250:8,20 265:7  
 275:10 278:9 279:8  
 321:15 322:6 412:17  
 412:19 432:8 482:20  
**greening** 148:9  
**greens** 3:2 241:16  
 427:1 458:13  
**greet** 18:5  
**Greg** 15:22 16:4  
**grew** 353:5 417:1,7  
**Grimm** 314:1,3  
**Grimmway** 2:17 313:11  
 313:12,17,22  
**Grocers** 3:4 401:9,13  
 403:18  
**grocery** 315:16 410:8  
**gross** 366:5  
**ground** 67:1 79:14  
 189:1,13 190:3  
 191:20 196:3 197:18  
 197:20 198:17 235:14  
 246:13 262:4 304:7  
 304:20 312:18 328:9  
 328:15,17,19 348:17  
 353:9 365:22 366:17  
 366:22 381:10,11,21  
 391:8 393:5 395:17  
 412:11 414:2 415:3,7  
 420:5,7 424:22  
 461:22 464:13 469:15  
 486:8 489:5 492:10  
**ground-based** 415:9  
**grounded** 307:5  
**grounds** 469:2  
**groundwater** 476:2

481:19 482:1,2  
**group** 6:22 34:19 97:11  
 97:20,22 98:5,12  
 115:13 147:20 168:5  
 201:11 219:16,16  
 222:1 291:13 299:7  
 369:7,14 402:19  
 421:2 445:5  
**group's** 292:5  
**grouped** 170:17  
**groups** 11:10 97:13,16  
 219:15 274:17  
**grow** 79:2 190:12  
 235:13 241:22 242:14  
 246:9 250:18 256:21  
 301:13 302:7 303:3  
 304:22 309:7 310:9  
 313:20 327:21 330:19  
 343:18 344:2 395:6  
 405:16 409:20 412:9  
 412:10,19 413:20  
 414:18 419:13 422:12  
 424:1 425:6 442:9  
 449:22 454:3 465:21  
 467:18 469:14,15  
 472:6 475:7 487:18  
 491:3,6,16,17  
**growing** 11:14 233:12  
 235:12 236:12 256:6  
 301:4 306:9 313:18  
 327:19 361:9 407:4  
 419:18 448:6,12  
 454:6,6,22,22 461:6  
 469:15 475:14 476:5  
 481:15 489:17,19  
 496:6 500:3  
**growers** 3:11 10:1  
 66:13,13 97:14  
 230:16 256:1,5,21  
 257:12,17,19 258:15  
 258:18,20 259:5,8  
 260:13,17,20 261:1  
 264:9 274:15 280:7  
 309:6 310:6 388:4  
 403:12 419:4 442:2  
 443:2 444:2,5 447:5  
 450:5 454:1 460:20  
 464:13 473:6 475:4  
 476:19 477:7 478:13  
 479:11 480:18 484:15  
 485:1 489:16 490:10  
 492:9 496:7,14  
 497:10 498:4 500:4  
 500:11  
**growers'** 442:19 443:1  
**growing** 27:9 36:13  
 53:9 94:18 237:21  
 241:7 246:13 250:19

252:9,11 256:4,13  
 259:7,12,14 260:19  
 261:12 274:8 280:8  
 287:20 288:8 302:13  
 302:19 309:12,15  
 310:1 342:20 349:2  
 350:1 351:11,15  
 352:7 357:11 362:22  
 366:15 370:3,9  
 383:12,15 385:6  
 386:14 395:17 410:7  
 411:16 415:10,11  
 419:4 422:20 436:7  
 441:14,17 447:1  
 456:2,12 459:5,8,14  
 460:17 461:1,4  
 471:10 474:21 475:3  
 476:15 482:19,20  
 483:5,19 484:11  
 491:1,11  
**grown** 235:18 244:13  
 245:8 249:6 260:13  
 261:4 314:7 327:20  
 332:17 333:20 376:3  
 376:5,8 377:4 387:3,8  
 404:4 406:22 410:20  
 412:17 415:15 436:5  
 445:10 449:12 455:9  
 461:21 464:7 493:13  
 493:13  
**grows** 290:11 414:14  
**growth** 22:17 26:6,9  
 65:19 190:14 229:8  
 460:6 475:19  
**Grupo** 3:5 264:9  
**guano** 317:1  
**guaranteed** 494:16  
**guardian** 102:6  
**guess** 87:10,12 110:14  
 122:3 167:5 174:12  
 189:17 193:5 201:17  
 218:8 283:2 288:21  
 303:1 338:12 348:12  
 352:8 392:13 407:5  
 418:22 419:10 488:16  
 489:7  
**guidance** 230:10  
 290:15 292:12,14  
 295:6,17 368:18,21  
 409:22  
**guide** 39:6 151:8  
 207:21 254:17  
**guidelines** 207:17  
 209:19 210:19  
**guise** 461:7  
**Gulf** 3:5 231:13  
**gum** 213:8 219:4  
**gummy** 462:20

**gums** 218:14,16,19,22  
 219:1,2,3  
**Guo** 17:11 80:22 84:3  
 87:13 95:21  
**gutters** 481:13

---

**H**


---

**habitat** 300:10  
**habits** 384:9  
**HACCP** 464:16  
**Haiti** 256:12  
**half** 10:10 54:11 96:1  
 246:6 305:22 310:12  
 320:2 381:17 452:15  
 453:3  
**half-acre** 322:6  
**Hall** 367:3  
**Hall-Beyer** 364:12  
**Halloween** 5:14 102:3  
**hallway** 100:14  
**halt** 443:10  
**Hammer** 2:21 441:8  
 448:21 449:3,3 452:7  
 453:17 454:5 456:8  
 457:8,12,16,21  
**hammers** 63:19  
**Hampshire** 389:7,7  
 390:6  
**hand** 7:10 21:19,19  
 103:19 167:19 260:8  
 279:15 336:16 410:22  
**handbook** 29:15 52:15  
 57:20 207:18 209:20  
 217:6  
**handful** 327:16 400:15  
**handing** 364:19  
**handle** 190:17  
**handled** 291:15 495:21  
**handler** 200:22  
**handlers** 26:16 28:21  
 29:1,4 38:9 97:14  
 117:10 439:11  
**handing** 114:16  
**handling** 8:15 20:11  
 200:8,22 201:2,21  
 208:5,8 212:5,7,20  
 213:11 214:8,11  
 218:15 232:17 314:5  
 368:7 428:6,22  
**hands** 95:19 265:21  
 380:21 444:22  
**handwriting** 21:14  
**handy** 224:22  
**hang** 120:14  
**haphazard** 253:11  
**happen** 40:8 65:18  
 69:18 88:8 128:6  
 152:12 183:4 225:3

281:20 383:18  
**happened** 150:1 198:19  
 231:16  
**happening** 48:3 49:12  
 58:12 106:21 123:4  
 155:9,14,17 169:21  
 201:7,10 255:10  
 322:11 323:6,11  
 384:3 432:11  
**happens** 20:2 47:10  
 90:18,18 124:18  
 187:1 200:21 333:12  
 333:14 380:19 438:2  
 480:16 486:13 495:22  
 496:3  
**happier** 389:19  
**happily** 478:7  
**happy** 5:14 23:10 59:17  
 87:9 92:6 220:14  
 221:17 268:15 351:6  
 401:18  
**hard** 18:16 38:21  
 174:12 177:4 223:17  
 244:17,21 327:5  
 329:3,6 348:4 352:16  
 364:2 390:15 405:16  
 409:12 415:18 421:10  
 422:5 424:3 425:21  
 433:6 453:10  
**hard-wired** 362:1  
**hard-working** 411:8  
**Harlow** 2:22,22 409:6  
 416:6,16,16 419:15  
 419:17 420:1,6  
**harm** 47:15  
**Harriet** 1:14 11:13 60:4  
 67:21 78:6 80:14  
 86:15 167:1 173:12  
 178:16 199:3 233:16  
 233:17 245:22 262:6  
 277:20 285:6 298:13  
 305:5 312:4 318:14  
 320:15 324:18 338:6  
 344:21 359:9 367:1  
 369:20 398:20 436:10  
 483:12  
**Harriet's** 65:1  
**harvest** 2:16 235:12  
 265:6 320:7 404:15  
 407:21,22 412:12  
 475:21  
**harvesters** 404:17  
**harvesting** 364:7  
 412:11  
**hat** 190:21,21,22  
**hate** 405:18  
**haul** 394:9  
**haunts** 102:9

**hay** 450:2  
**head** 279:11  
**head-on** 352:5  
**headed** 406:10  
**headquarters** 135:19  
**heads** 120:8 122:17  
 139:3 188:18 275:21  
**healing** 286:4 314:18  
**health** 28:5 106:2,7  
 113:13 114:20 134:21  
 143:22 144:3 145:4  
 145:10,13 149:10  
 155:11 207:12 271:1  
 301:16 341:13,21,22  
 344:19 345:10,16,17  
 346:5,17 349:18  
 375:12,19 377:7  
 383:3 408:17 421:8  
 434:16 435:19 459:15  
**healthier** 259:11 330:19  
 433:16 459:15  
**healthiest** 257:1  
**healthy** 301:18 314:16  
 376:8 382:20 403:5  
 423:22 442:1 443:14  
 478:4 498:15  
**heaps** 228:19  
**hear** 8:1 32:16 48:7  
 66:14 71:22 72:2 87:9  
 110:15 216:1 224:13  
 226:16 242:8,10  
 272:13 285:7 307:8  
 321:3 322:13 339:1  
 343:21 358:8,13  
 371:21 415:4 431:22  
 454:4 463:3 465:6  
 478:19 488:11,17  
**heard** 126:20 155:8  
 156:20 157:20 199:21  
 219:20 246:19 263:8  
 323:19 331:3,6,20  
 342:19 348:18 350:19  
 350:22 358:11,15,17  
 358:17 378:7 381:14  
 383:5 407:6,10  
 439:18,19 445:3  
 469:6 475:10  
**hearing** 197:10 392:14  
 464:18  
**heart** 243:21 434:16  
**heartened** 93:16  
**heat** 151:16  
**heavily** 138:13 343:2  
**heavy** 250:10 361:19  
 423:20  
**heavy-duty** 303:4  
**hectares** 278:8  
**heed** 20:17

**held** 17:17 120:16  
 464:12,14  
**hello** 7:12 18:7,8 231:8  
 282:18 401:10 463:1  
 463:5  
**Helmy** 286:19  
**help** 36:18,19 55:8,11  
 67:9 71:8 80:1 81:6  
 81:10,14,14 106:20  
 107:5 154:14 162:13  
 162:16 164:12 166:14  
 171:10 182:2 189:15  
 198:2 204:3 219:13  
 224:6 229:7 243:16  
 250:10 336:20 394:14  
 405:9 444:14  
**helped** 40:11 51:10  
 321:9,19 383:10  
**helpful** 28:7 55:2 66:20  
 191:12,16 201:4,9  
**helping** 15:11 23:12  
 55:5 71:14  
**helps** 36:6,7 37:3 107:4  
 180:15 300:17  
**Henry** 77:15  
**herbicides** 417:6  
**herbs** 236:6 256:6  
 275:22 282:11 380:2  
 458:13  
**hero** 338:12,13  
**heros** 338:11  
**hesitation** 385:8 456:8  
**Hexane** 355:13  
**Hexane-free** 355:14  
**hey** 72:2,5  
**Hi** 10:11 19:9 235:10  
 238:3 241:15 251:9  
 295:12 297:19 298:14  
 301:2 354:15 471:8,8  
**hide** 336:17  
**hierarchy** 175:12  
**high** 3:9 28:18 31:5  
 108:15 129:5 136:18  
 363:8 403:12 409:10  
 421:19 434:14 475:18  
 476:14 490:3  
**high-risk** 27:22  
**high-yield** 314:19  
**higher** 171:11 332:3  
 362:8 405:8 486:11  
**highest** 138:22  
**highlight** 22:11 37:5  
**highlighting** 33:19  
**highlights** 224:20  
**highly** 236:17,20  
 246:15 250:15 269:6  
 288:10 340:12 347:1  
**Highway** 134:13

**hill** 168:21 380:1 449:7  
 449:11 450:2  
**hinge** 156:20  
**hiring** 87:10,12 88:7  
 89:8,18 90:11,17,18  
**history** 303:22 307:5  
 326:22 359:1 416:21  
 430:21 450:21  
**hit** 482:4 491:22  
**hits** 65:8  
**hitting** 481:17 482:2  
**hold** 43:21 125:14  
 129:10 137:17,19  
 205:3,4 386:10  
 463:21  
**hold-intact** 123:14,16  
**holder** 222:11  
**holding** 102:16 500:19  
**holdover** 171:2  
**holds** 137:18,21 138:4  
**hole** 195:10  
**holes** 80:5,9  
**holistic** 302:19 408:17  
**Holland** 361:5  
**home** 20:19 92:7,9  
 154:17 334:17 391:12  
 460:20  
**Homeland** 105:20  
 106:6,12 110:22  
 131:2 147:5  
**hone** 290:20  
**honest** 459:11 468:3  
 472:21 479:9 497:1  
**honestly** 279:9 288:2  
**honey** 211:20  
**honor** 5:22 17:6 222:6  
 223:1 332:13  
**honorable** 282:18  
**honored** 458:20  
**honoring** 332:15  
**hope** 7:16 172:16 244:7  
 313:6 328:5 331:4  
 357:3 363:1  
**hoped** 367:17  
**hopeful** 376:1  
**hopefully** 131:11 185:5  
 294:3  
**hoping** 86:17 326:15  
 474:7  
**hormones** 359:7  
**horticultural** 264:7  
**hospitality** 7:17  
**host** 149:8 247:3  
**hosting** 103:2  
**hot** 149:19 255:17  
 264:13 311:22 491:7  
**Hotchkiss** 9:22  
**Hotel** 1:9

**hotly** 338:2  
**hours** 6:21 96:1,21  
 124:2 251:17 274:10  
 367:9 374:20  
**house** 413:19,20  
 423:13,15  
**households** 408:15  
**housekeeping** 97:4  
**houses** 233:8 235:14  
 264:13  
**Howard** 3:9 401:6 409:5  
 409:7,9 418:10  
 453:12  
**HPTA** 227:17  
**HS** 183:12,22  
**HTS** 187:15,16,20,22  
**Hubery** 3:13 463:7  
**huge** 77:7 136:19  
 179:15 223:16,21  
 246:10 247:6 305:16  
 410:6 499:18  
**humalite** 229:17  
**human** 134:21 207:12  
 261:20 284:21 343:17  
 344:2,8,16 408:8  
**human-caused** 331:10  
**humanity** 283:12  
**humanity's** 450:20  
**humans** 243:8 300:11  
 301:17 341:16,17  
 344:20 347:11  
**humic** 3:12 227:16,18  
 227:19,21,22 228:3,4  
 228:7,11,17,18,21  
 229:1,5,7,11,13,15,22  
 230:8,11,13,15,19,20  
 231:1  
**humor** 101:12  
**humus** 286:3 484:2  
 487:14  
**hundred** 120:20 323:2  
**hundreds** 14:21 128:16  
 142:8  
**hung** 182:14  
**hungry** 343:11  
**hunting** 362:7  
**hurdles** 93:5  
**hurting** 240:2  
**hydro** 385:18 391:14  
 468:7  
**hydrochloric** 21:15  
**hydroganic** 308:5  
**hydroganics** 307:3  
**hydrolyzed** 236:19  
 262:11,14 311:19  
 312:7  
**hydroponically** 244:13  
 249:9 327:20 356:17

376:3 377:4 406:22  
**hydroponics** 235:18  
 241:7 242:11 256:3  
 257:4 259:13 270:21  
 272:18 274:7 277:22  
 280:20 289:15 295:14  
 302:1,8,11 303:20  
 316:4 324:4 333:3  
 337:16 342:19,20  
 348:7 356:10 357:10  
 366:6 376:17 379:14  
 381:4,5 382:14 385:6  
 385:9 386:13 387:7  
 388:7,8 393:5 394:7  
 401:11 411:2 416:19  
 429:8 431:9 436:7,12  
 441:14 471:10,11,12  
**hydros** 447:11  
**hydrosphere** 283:21  
 284:14  
**hydroxide** 228:9  
**hypochlorous** 211:9

## I

**i.e** 189:2  
**lan** 3:2 445:18 446:7  
 462:16 474:3,4,7,10  
 474:14 478:9 501:9  
**lbach** 15:22 16:4  
**idea** 200:15 285:19  
 383:12 425:18  
**ideal** 498:18,20 499:2  
 499:18  
**idealistic** 334:14 335:1  
 335:3,7 336:22  
**ideally** 50:12  
**ideas** 161:17 162:21  
 330:13 465:7  
**identical** 42:5 404:21  
**identification** 147:16  
**identified** 53:21 62:13  
 122:13 165:21 170:10  
 170:21 184:5  
**identifiers** 147:18  
**identifies** 46:20  
**identify** 46:15 48:22  
 61:9 143:1 172:11  
 173:19 180:13 182:3  
 204:19  
**identity** 370:17 371:4  
 460:8 462:8  
**IFOAM** 2:12 274:3  
 393:2  
**ignorance** 450:18  
**ignores** 315:8  
**II** 417:5  
**illegal** 355:6,20,21  
 356:18 361:6 427:22

**Illinois** 451:16  
**illuminated** 332:19  
**illustrate** 259:6  
**illustrated** 360:21  
**illustrates** 229:4  
**image** 135:11  
**imagine** 238:21 402:17  
 402:22 403:7 423:4  
 425:10  
**imaging** 334:22  
**immature** 230:17  
**immediate** 459:10  
**immediately** 124:16  
 181:14 236:17,20  
 242:1  
**immense** 301:17  
 349:15  
**impact** 66:17 169:8  
 320:18,20 330:21  
 340:8 400:17 434:15  
 472:16 473:15 477:10  
**impair** 98:11  
**imperative** 292:11  
**imperfect** 250:22  
**implement** 42:12 164:6  
**implementation** 54:6  
 109:12 131:16 133:3  
 136:14 137:9 141:18  
 153:21 160:10  
**implemented** 133:22  
 153:16 164:11,17  
**implementing** 51:15  
 73:12 165:13 369:18  
**implication** 26:12 387:2  
**import** 25:14 29:8 30:3  
 30:5 39:18 41:10  
 42:18,22 43:3,5,17,22  
 44:13 45:2,11,18 46:1  
 46:8,20 67:17,18  
 78:11 104:21 108:16  
 116:14 117:7 118:19  
 121:2 126:5 152:4,8  
 154:20 157:20 159:9  
 159:11,14 166:11  
 172:10 173:6 174:14  
 175:6 184:21 185:1  
 194:2 202:5  
**import/export** 188:10  
**importance** 67:4 68:20  
 182:1 274:12 360:15  
**important** 15:11 16:17  
 20:5,15 21:4 40:9  
 44:10 61:20 75:11,12  
 75:18 79:10 86:4,5,8  
 86:11,13 105:4  
 110:14 111:13 123:11  
 126:3 127:8 128:14  
 156:22 160:1 174:20

192:7 205:10 206:1  
 224:20 242:3 244:1  
 253:8 254:11 258:3  
 268:17 269:14 270:10  
 271:19 290:13 295:14  
 310:2 326:18 327:1  
 340:4 342:5 354:3  
 358:16 364:17 367:12  
 367:19 379:8 382:20  
 418:4,6 428:14 434:8  
 434:10 454:8 456:20  
**importantly** 97:2 124:3  
 128:18 129:1 228:2  
 410:13  
**importation** 108:1  
 112:22 114:19  
**importations** 147:15  
**imported** 29:19 43:6  
 48:16,22 49:8 104:3  
 104:18 105:5 117:1  
 128:19 134:7 152:22  
 153:18 166:16 185:7  
 190:11 202:1 204:3,8  
 204:15  
**importer** 47:18,19  
 120:2 122:11 124:14  
 146:19 151:20 187:14  
 202:14  
**importers** 48:4 50:3  
 119:12 122:5 132:17  
 204:22  
**importing** 110:8,9  
 203:6  
**imports** 4:13 8:6 13:18  
 21:18,22 22:2,4 26:3  
 29:10,15 30:21 31:12  
 32:7 39:16 41:5 45:11  
 48:14 51:22 61:3  
 103:8,18 109:2  
 113:18 114:14 115:12  
 124:11 128:8 129:10  
 155:20 156:12 159:15  
 162:18 163:5 172:6  
 175:6 184:15 186:9  
 186:20 188:14 190:7  
 191:21 192:14 193:9  
 203:21 204:19 240:3  
**impressed** 52:20 96:7  
**impressive** 35:9 391:19  
**imprint** 473:12  
**improve** 36:22 53:21  
 55:17 62:15 66:15,21  
 110:7,21 232:11  
 265:1,3 273:9 277:14  
 421:11 434:2  
**improved** 108:12  
 433:22 490:16  
**improvement** 52:18

63:22 139:7 270:15  
 270:19 271:13 393:9  
 402:17 406:9  
**improvements** 23:22  
 112:9  
**improving** 55:19 104:3  
 104:15 166:16 324:1  
**impugn** 226:15  
**impurities** 231:18,20  
**in-between** 179:13  
**in-house** 126:16  
**in-person** 29:11  
**in-soil** 279:7 446:16  
**in-the-ground** 278:22  
 312:21  
**in-the-soil** 278:22  
**inadequate** 41:14  
**inadvertent** 187:6  
**inappropriate** 187:15  
**incentive** 253:17  
**incidentally** 346:22  
**include** 21:11 33:1  
 58:18 69:14 88:16,17  
 97:13 151:13 207:11  
 210:6 211:9 219:1  
 220:8,11 373:16  
 424:21 428:5 432:9  
 435:3 465:2  
**included** 126:14 131:16  
 211:10 213:3,22  
 291:16,22 447:18  
**includes** 24:21 26:14  
 26:17 38:4 40:4  
 139:14 140:8,22  
 143:14 145:12 163:8  
 208:16 212:13 220:11  
 315:1 366:21 402:4  
**including** 17:19 57:14  
 105:16 210:13 231:18  
 240:10 356:2 364:6  
 372:16 433:17 434:17  
 443:5 462:5  
**inclusion** 82:21 254:8  
 254:15 378:4 441:21  
**inclusive** 188:21  
**incoming** 23:2 46:11  
 49:5 72:19  
**incomplete** 56:19  
**inconsistency** 289:1  
**inconsistent** 237:1  
 428:6,8  
**incorporate** 270:17  
 497:7  
**incorporated** 497:9  
**incorporates** 485:9  
**incorrect** 56:18 446:4  
**increase** 127:10 156:18  
 190:9 191:20 229:1

233:10 407:9 457:5  
 460:18 475:19  
**increased** 24:2 26:10  
 27:17 28:20 31:5 63:2  
 63:2 127:8 142:3  
 189:4,7 297:14  
 421:13 490:18  
**increases** 189:8  
**increasing** 255:2,4  
 301:12  
**increasingly** 27:10  
 290:13 349:14 352:2  
 459:14  
**incredibly** 7:2 269:21  
 270:10 271:19 379:8  
**incumbent** 379:3  
**incurred** 459:5  
**independent** 40:6  
 52:12 97:19 433:13  
**indicate** 57:1  
**indicated** 77:1 230:17  
 465:19  
**indicates** 455:3  
**individual** 99:10 100:21  
 226:16 314:17 373:7  
 374:6  
**individually** 215:22  
**individuals** 101:7,9  
 138:9 220:2  
**indoors** 261:13 285:13  
**industrial** 227:21  
 356:16  
**industries** 115:9 130:4  
 459:21  
**industry** 22:18 26:5  
 27:10 53:9 65:19 66:1  
 79:2 111:6 161:22  
 163:3,17,21 227:18  
 228:5 239:12,15  
 240:2,11,11 251:10  
 256:11 272:9 274:1  
 290:11 355:13 377:20  
 384:7 403:10 409:20  
 409:20 410:6,15  
 411:10 441:18 464:10  
**industry-run** 161:19  
 162:2  
**inert** 82:13 384:2 388:1  
 483:21  
**inerts** 82:20 86:17 87:1  
 369:7,10,14  
**infant** 355:2  
**infestations** 318:4  
**influence** 459:21  
**info** 276:20  
**inform** 61:10 150:21  
**information** 23:7 36:6  
 44:5 49:18 50:10 58:5

61:12 68:3 70:3 72:20  
 74:5 81:2,6 100:3  
 102:20,21 108:13  
 111:16 126:15 132:18  
 132:19,19 135:17  
 143:12,13,14 158:14  
 172:12 179:20 180:17  
 181:6 191:8 196:1,19  
 197:1 209:16 210:21  
 220:8 244:15 253:7  
 272:17,21 273:4,5,6  
 359:15,16 372:19,22  
 373:2,17,20 374:3,7  
 387:6,11 410:2  
 418:11 466:1,5  
**informative** 73:19  
**informed** 25:15  
**Ingram** 465:16  
**ingredient** 230:21  
 372:17 434:5  
**ingredients** 9:18 20:10  
 82:13 434:8,13 435:1  
 438:19 459:18  
**inherently** 364:16  
 452:18 456:3 477:12  
 486:19  
**initial** 34:9 89:7 209:13  
 210:22 290:9  
**initially** 90:10 184:12  
 316:15  
**initiatives** 30:19 31:10  
 31:16,19 144:17  
 153:12 196:13  
**innovation** 350:3 442:7  
 442:13 443:11,19  
 444:15 460:16  
**innovative** 351:11  
**inoculants** 316:19  
**input** 34:20 86:20 160:2  
 205:9 236:17 246:16  
 279:20 314:12 341:6  
 365:5 370:14,19  
 372:13 490:18 492:11  
 492:17 493:5,17  
 494:8  
**input-intensive** 340:12  
**inputs** 237:8 246:4  
 248:9,15,19 249:18  
 252:12 273:13 303:8  
 336:6,11 340:14,14  
 340:16,21 342:3  
 343:2 346:9,13,17,21  
 367:6 372:1 413:4  
 425:15 426:12,15  
 444:7 480:9 490:11  
 494:6 500:12  
**insect** 302:22  
**inseparable** 375:20

**inside** 291:11 292:9  
**insights** 6:22 163:2,12  
 166:1  
**insoluble** 494:21 495:6  
**inspected** 118:3 119:2  
 122:20 125:11 193:3  
 197:17 200:9 364:14  
 448:16  
**inspection** 28:5 47:13  
 76:5,14 77:2 106:8  
 113:13,16 114:15,16  
 117:9 120:3,7,11,12  
 120:17 121:22 122:8  
 122:17,18,22 123:1,5  
 123:10,11 124:20,20  
 125:2,5,7,8 143:22  
 144:3,17 145:4,10  
 147:1 150:7 152:10  
 153:19 155:11 185:11  
 198:22 367:12  
**inspections** 10:16  
 26:15 27:2,17 30:9  
 75:11,13,15,17 76:17  
 76:18,20 120:18,21  
 147:12,15 164:3  
 195:16 198:18 401:17  
 443:4,6  
**inspector** 4:7 13:21  
 39:22 40:2 79:10  
 364:14 367:4,7  
**inspectors** 79:7,13  
 147:9 165:5,11,14  
 197:19 448:16  
**Inspirations** 337:2  
**instance** 57:2 185:18  
 186:4 288:11 326:19  
**instances** 56:18 188:4  
 189:19 402:2  
**instead-of-soil** 452:18  
**Institute** 2:16,17 3:3,7  
 52:9 330:8 334:10  
 354:16 368:5 382:8  
**institutions** 275:17  
**instructed** 58:13  
**instruction** 29:14,17  
 30:1,9,14,16  
**instructions** 45:17  
 49:10  
**insufficient** 253:13  
**intact** 205:4  
**intake** 71:14 72:7  
 434:14  
**integral** 422:2  
**integrated** 149:16  
 344:11 442:5  
**integrating** 286:1,21  
**integration** 167:9  
**integrity** 13:19,20 22:14

24:18 26:2,21 27:9  
 28:22 30:14 32:3  
 33:18 34:2 35:3,12  
 37:2,6,12,15 38:16,18  
 39:1 40:22 49:19  
 51:21 59:16 60:22  
 64:1,17 66:15 67:5  
 68:7 69:3,11,15 72:13  
 92:21 104:12 105:5  
 110:21 124:13 156:17  
 157:15 158:14,16  
 162:8 163:5 179:8  
 182:2 201:5 202:7  
 244:2 270:14 290:10  
 323:10,12 354:2  
 380:10,16,17,22  
 393:22 394:10,17  
 419:19 433:20 461:11  
**intense** 467:10  
**intensely** 323:10  
**intensive** 341:7  
**intent** 263:16 297:7  
 302:18 315:8  
**intention** 263:9 268:21  
 476:9  
**interact** 66:12 131:18  
**interacting** 106:1  
 130:22  
**interaction** 100:21,22  
 284:10 386:17 394:11  
 452:17  
**interactions** 83:20  
**interactive** 115:14  
 116:4 126:22  
**interacts** 111:12 113:15  
 116:5  
**Interagency** 112:3  
 140:11 168:1  
**interdependent** 375:19  
**Interdiction** 147:19  
**interest** 9:8 11:1,10  
 27:17 39:2 63:1 97:5  
 97:11,13,16,20 98:3,7  
 98:8,9 99:1,7,11,15  
 125:11,19 137:8  
 206:18 208:22 213:10  
 214:4 327:3 375:12  
 421:14  
**Interest/Special** 11:10  
**interested** 20:20 63:6  
 90:12,22 102:22  
 217:2 242:7 244:4  
 269:22 307:8 327:14  
 469:4 472:20  
**interesting** 144:7 150:1  
 178:14 204:9 242:14  
 309:22 367:3 426:18  
 438:7 450:20

**Interestingly** 24:8  
**interests** 14:11 97:10  
 97:21 98:2,3 100:3  
**interface** 183:1 203:21  
**interfaces** 69:22  
**intergenesis** 435:3  
**interim** 29:14 191:17  
**internal** 54:21  
**internally** 119:21  
 153:14  
**international** 2:14  
 39:15 41:4 57:13  
 105:21 109:19 132:4  
 146:6 157:17 159:15  
 160:10 164:16 177:13  
 227:19 410:6 421:18  
 456:10  
**internationally** 228:6  
 393:1 437:6  
**interpret** 172:19 173:1  
**interpretation** 85:13  
 292:6 293:21 294:17  
 295:2  
**interpreting** 366:5  
**interrupt** 226:17  
**interstate** 421:18  
**interval** 188:14  
**interviews** 89:9 91:7  
**introduce** 7:8 9:1 19:7  
 105:7  
**introduced** 71:15  
**introduction** 103:20  
 107:15  
**introductions** 4:4 7:19  
 7:22 8:22 216:2  
**Intuition** 103:3  
**invaluable** 96:20  
**invasive** 146:12,16  
 148:11 152:15 300:6  
**inventories** 178:9  
**inventory** 160:16  
 161:13  
**invest** 19:4 39:8 157:22  
**invested** 6:20  
**investigate** 24:12 27:2  
**investigated** 74:10,12  
 309:4  
**investigation** 75:9  
 127:12  
**investigations** 23:19  
 25:14,18 30:20 40:7  
**investing** 36:20  
**investment** 39:8 112:13  
 158:16 375:17  
**investments** 194:10  
**invitation** 107:20  
**invite** 65:20  
**inviting** 144:9

**involve** 162:4,5 164:7  
**involved** 82:20 84:7  
 90:6 111:14 112:2,21  
 162:18 163:7 177:8  
 194:16 220:2 240:13  
 279:5 355:5 361:9  
 362:4 389:15 390:13  
**involvement** 239:13  
**involves** 89:8 90:20  
 133:4 170:7 171:3  
**involving** 39:17 159:2  
 283:20  
**Iowa** 3:4 12:1 288:11  
 386:3 451:1  
**IPM** 149:16  
**iron-inefficient** 499:5  
**ironed** 171:9  
**ironic** 423:19  
**irradiation** 149:19  
 151:16 392:19  
**irrelevant** 408:22  
**irrigate** 267:20  
**irrigating** 266:1  
**irrigation** 228:20  
 248:18 286:15 482:5  
**irritant** 234:11,17  
**irritations** 235:3  
**Island** 37:17  
**ISO** 54:13 56:11  
**ISO/IEC** 53:6  
**isolate** 356:3  
**isolated** 57:2 480:4  
**isothiocyanate** 210:6  
 210:13  
**issue** 58:21 105:4  
 182:13 195:20 202:21  
 206:1 247:9,15,19  
 249:5 261:16 290:10  
 296:4 298:15 306:4  
 309:4 313:4 323:2  
 342:4 344:3 346:6  
 368:6 374:21 378:9  
 381:18 382:14 383:16  
 389:16 390:4,19  
 403:17 454:8 456:7  
 460:8 473:8  
**issued** 27:13,15 133:9  
 214:9 221:21 431:15  
**issues** 71:4 92:14,19  
 100:19 139:13 143:19  
 145:19 146:4 208:22  
 234:6 247:3 250:11  
 285:8 295:21 339:20  
 343:15 378:9 402:8  
 408:6 451:5 499:7  
**issuing** 30:5  
**it'll** 202:12  
**ITDS** 109:18 110:1

111:16,18 132:3  
 153:14 191:8 194:15  
**item** 46:9 49:14 56:1  
 79:18 80:15,19 81:4  
 83:10,10 104:13  
 164:22 185:7  
**items** 8:17 97:4 99:5,9  
 165:20 224:9 241:1  
 303:6

---

**J**


---

**J.I** 330:14 331:3,5,20  
 332:15  
**Jack** 364:8  
**Jacksonville** 1:9,9 5:14  
 14:8 15:9 33:20,22  
 156:11 473:11  
**James** 283:16  
**January** 22:16 48:20  
 291:21  
**Japan** 46:3 434:18  
 438:10  
**Japanese** 423:7 437:4  
**Japones** 213:6  
**Jeff** 3:7 273:6 377:14  
 382:4,5,7 387:20  
**jelly-based** 234:20  
**Jen** 293:14 392:5 396:6  
 396:7  
**Jennie** 12:18,20 13:5  
**Jennifer** 2:6,11 5:8  
 156:5 197:3 396:11  
**Jenny** 7:12 8:2,22  
 59:20 60:9 63:9 67:19  
 68:1 73:18 78:8 81:18  
 82:11 84:22 87:8  
 89:22 91:18 92:7  
 95:10,17 96:3 106:22  
 109:13 117:14 144:1  
 166:9 169:11 172:3  
 177:12 221:12 224:1  
**Jenny's** 168:20 176:7  
 177:3  
**jeopardizes** 461:12  
**Jesse** 1:13 3:5 10:6  
 12:5 227:11 231:6,8  
 233:15  
**Jim** 2:15,20,21 3:10  
 273:20 282:17,19  
 285:5 287:7 325:11  
 329:10,19 330:2,5  
 334:4 354:12 363:12  
 363:14,17,20 366:11  
 367:21 420:10 427:5  
 427:7,9 430:3,7,10  
 433:3  
**Jim's** 363:15  
**Jo** 2:9 289:18 295:10,12

297:19 298:14 300:19  
**job** 11:19 73:11 88:12  
 88:16 89:2 90:6 91:1  
 425:7 433:6 470:5  
 472:19 473:19 475:3  
**jobs** 113:6  
**Joe** 256:10  
**Joelle** 1:17 9:17 238:2  
 250:2 482:6  
**Johanna** 3:6 363:13  
 367:22 368:1,4  
**John** 311:21 488:1,12  
**Johnson** 3:2 235:7  
 241:12,15,16 244:14  
 245:7,11 246:5 247:5  
 248:6,10,14,17  
 249:16,19 250:7  
 251:4  
**join** 468:2  
**joining** 157:6  
**jokes** 101:13  
**judge** 33:13 307:7  
**judicious** 303:8  
**July** 19:14 51:9 63:14  
 64:3,5,13 128:10  
 173:21 223:1 239:4  
 291:13  
**justice** 106:15 361:12  
**Justin** 251:6 255:13,14  
 255:15,15  
**Justus** 3:2 445:18  
 462:17 474:3,12,14  
 479:8 481:3 482:11  
 482:15 484:6,13  
 488:8,15 489:6,13  
 491:12 492:14,17  
 493:14,19 494:12  
 496:5 497:16 498:18  
 498:20 499:1,4,9,13  
 500:2,16 501:10

## K

**kaolin** 232:10  
**Karl** 2:21 441:7 448:21  
 449:1,3 458:2  
**Kastel** 3:3 282:22  
 347:19 354:12,15,15  
 357:16,19,22 358:7  
 358:15 359:14 360:4  
 360:16,19 363:7  
**Kathleen** 365:5  
**keep** 25:15 36:12 40:1  
 85:8 91:20 92:2  
 102:15 140:18 146:12  
 146:16 170:13 222:7  
 222:10,16 224:14  
 243:6 244:1 250:18  
 267:9,10 276:11

308:21 322:8,16  
 326:19 328:7,7  
 372:20 378:14 417:8  
 439:7 444:14 452:21  
 462:2 480:19 483:10  
**keeping** 25:14 30:8  
 53:22 85:5 328:22  
 474:4  
**keeps** 279:11 373:2  
 423:20  
**keepsake** 222:16  
**kelp** 229:6  
**Kempner** 3:3 347:21,22  
 350:13 351:5,8  
 352:20 354:10  
**kept** 91:22 131:8  
 159:19  
**Kevin** 15:19,20  
**key** 20:19 21:20,22 22:8  
 32:8 47:5 108:6 109:9  
 141:22 142:14 151:3  
 151:19 414:16 477:3  
**keys** 152:10  
**kid** 242:2 388:18 417:18  
**kidding** 403:2  
**kidney** 434:15  
**kids** 238:19 326:14  
**killed** 233:1  
**kinds** 69:12 244:22  
 273:2 346:1  
**kinks** 179:21  
**Kirschenmann** 3:4  
 334:7 339:14,15  
 343:5 345:3,7  
**Kitchen** 379:21  
**knife** 305:21 306:4  
 381:16  
**knock** 405:3  
**knotty** 457:22  
**knowing** 181:21 462:11  
**knowledge** 28:14,15  
 201:10 229:5 256:18  
 349:20 450:17  
**knowledgeable** 336:22  
**known** 152:14 193:11  
 233:6 234:10 247:18  
 283:9 308:2 318:9  
 383:1 402:1 420:17  
**knows** 81:5 125:21  
 331:11,19 372:18  
 406:12 467:13  
**Korea** 46:2  
**kumquats** 124:15  
**Kyla** 3:11 282:17  
 289:18,19,22 293:18

## L

**lab** 230:5

**label** 180:6 234:3  
 244:19 245:1 247:3  
 247:21 268:12 270:5  
 278:2 297:16 306:16  
 307:1,12,19,22  
 308:11 316:6,7 335:4  
 336:18 361:6,18  
 376:19 378:5,6,15  
 379:14 391:22 392:1  
 405:20 406:19 411:3  
 421:15 422:5 429:22  
 430:6 433:21 436:13  
 453:10 459:13 460:11  
 462:9,10 466:5 468:5  
 468:9,15 469:17  
 487:15  
**labeled** 48:9 50:5 104:7  
 272:12 278:17 290:21  
 291:12,18,19 292:8,9  
 294:14 434:11 436:4  
**labeling** 180:8 183:17  
 244:11 253:1 290:20  
 291:3,5 292:4 427:21  
 459:22 462:19  
**labels** 271:10 291:6,11  
 403:1 440:9 459:17  
 469:22 494:15  
**labile** 267:3,4  
**lack** 229:4 237:2 286:3  
 303:5 379:2 398:9  
 422:19 486:17  
**ladies** 235:11  
**Lady** 2:10,10 301:3  
 325:19  
**lag** 195:2  
**laid** 353:9  
**lamb** 402:6  
**land** 119:17 246:9  
 287:3 296:7,8,10  
 297:8,14 298:21  
 299:16 300:13 301:11  
 303:19 304:9,11  
 313:21 314:9,11  
 315:4,9,13 339:7,9  
 341:13,14,18,21,21  
 341:22 342:9 344:18  
 344:19 348:21 351:14  
 351:17,17 364:5,6  
 390:13 418:3,4,6,20  
 426:13 449:8,13,14  
 478:5  
**lands** 299:6,20 300:15  
 362:7 442:1  
**landscape** 67:11 157:1  
 258:9 483:18 484:7  
**landscapes** 444:11  
**language** 119:9 302:16  
 358:22 365:7 398:9

398:17  
**large** 132:5 168:17  
 194:3,10,10 247:8  
 321:2 387:21 437:13  
 460:4 463:12 486:15  
 486:21  
**largely** 403:10 408:9,21  
**larger** 16:11,13 361:10  
 399:3 497:10  
**largest** 44:14 301:4  
 313:17 356:15 361:1  
**lasted** 276:6  
**lastly** 103:2 113:21  
 128:22 258:18  
**late** 60:19 215:12  
 316:16 449:7 501:16  
**lately** 269:2  
**laudable** 394:15  
**laugh** 101:13  
**laughed** 101:17,21  
**Laughter** 12:21 92:3  
 101:14,18 408:3  
 422:10 474:6  
**launch** 55:7 59:8 270:6  
**launched** 34:7 36:16  
 37:8  
**law** 32:14 33:13,15  
 44:15 135:1 161:21  
 176:6 192:20 276:4  
 315:14 319:17 336:13  
 356:12 365:20 391:6  
 429:11,21 447:16  
 494:18  
**laws** 44:17 73:1,3  
 139:16  
**lawyer** 383:9 390:21  
**lawyered** 355:7  
**lawyers** 383:16 385:3,5  
**lay** 65:3 484:17  
**layer** 174:18 284:5,19  
 393:19  
**layers** 146:11  
**Lazor** 364:8  
**leach** 265:2 266:3  
**leaching** 263:17 481:6  
 482:1 484:3  
**lead** 231:19 274:17  
 283:2 298:14 307:21  
 318:11 321:9 476:1  
**leaders** 324:8 337:2  
**leadership** 15:14 17:18  
 17:21 18:2 80:21  
 136:18 427:15  
**leading** 155:8 227:17  
**leads** 140:5 180:17  
 183:19 318:3  
**Leaf** 278:21  
**Leahy's** 365:6

- leaning** 131:6  
**learn** 34:1 101:22  
 108:18 159:10,13  
 198:7 341:20 399:1  
**learned** 136:15 142:14  
 156:13,21 162:17  
 163:6 198:6,16  
 250:20 417:11 449:19  
 479:9  
**learning** 35:12,14 36:12  
 160:22 162:11 165:1  
 181:9 198:4,6,8 201:8  
 245:20 251:1  
**leave** 8:19 13:1 14:6  
 101:10 108:14 109:5  
 184:17 333:17 411:14  
 411:17 413:13 446:6  
 451:11  
**leaves** 370:22 476:7  
 485:8  
**leaving** 411:19  
**led** 40:20,21 41:1  
**left** 5:18 18:17 44:7  
 115:15 169:19 283:3  
 403:11 407:18  
**legacy** 95:15 132:9  
 409:17 411:12,14  
**legal** 129:8,9 137:11,12  
 137:15 138:6,18  
 172:2 186:2,16  
 355:21 356:7 494:15  
**legalize** 357:10  
**legally** 32:22 123:18  
 495:2  
**legislate** 357:10  
**legislative** 175:8  
**lends** 151:3  
**lens** 35:15  
**leonardite** 229:16  
**Leopold** 341:11 344:4  
**lessons** 142:14  
**let's** 9:3 22:7 26:3 33:17  
 47:2,11,14 48:11 54:1  
 61:4 107:14 130:17  
 162:12 182:6 297:16  
 444:9 460:8 473:5,9  
**LETIS** 37:16  
**letter** 73:3 355:5,8  
 365:14 379:18 381:3  
 382:2 447:16  
**letters** 73:8  
**lettuce** 256:20 321:5  
**lettuces** 256:6  
**level** 30:21,22 31:15  
 45:6 52:20 53:3 68:11  
 74:16 78:16 89:15  
 91:5 120:1 135:19  
 136:18 139:3 142:19  
 168:18 169:16 170:22  
 186:22 307:7 320:11  
 332:3 401:18 462:6  
 463:11 482:17 495:9  
**leveled** 128:18  
**levels** 26:20 75:22  
 138:22 248:11 305:11  
 482:9,10,19  
**leveraging** 193:13  
**levied** 24:4 204:15  
**Lewis** 2:4 3:4 18:17  
 80:13 83:17 84:16,19  
 103:19,21 130:17  
 143:20 155:7 166:7  
 205:13 221:11 396:7  
 401:5,8,8 404:11  
 406:1,15 407:2,17  
 408:4 409:3  
**liability** 123:19  
**license** 119:6  
**lieu** 207:14  
**life** 284:4,12,17,21  
 326:18 337:4,11  
 342:8,9 344:12 394:2  
 408:17 419:6,8  
 445:14 481:11 483:6  
**life-long** 330:16  
**lifting** 361:19  
**light** 107:22 225:4,5,7  
**ignite** 229:17  
**likewise** 148:7  
**Lima** 1:15 9:10,11  
**limb** 186:8  
**limelight** 113:7  
**limit** 174:13 225:10  
 235:21 236:1,5 257:6  
 257:8  
**limitation** 400:10,13  
**limitations** 349:7  
**limited** 45:10 71:2  
 265:5 275:12 285:10  
 348:21 351:16 443:1  
**limiting** 238:10,13  
**limits** 442:19 449:20  
**line** 55:8 112:16 121:22  
 168:21 253:2 287:18  
 294:17 299:11 318:19  
 318:22 373:19 381:7  
 444:1  
**lines** 201:3 249:15,18  
**lining** 168:10  
**link** 25:21 152:5 154:16  
**linked** 382:18  
**links** 428:17  
**Linley** 2:17 329:11,20  
 334:6,7,9  
**linoleic** 74:15  
**lip** 356:1  
**liquefied** 230:15,20  
 248:16 414:10 451:20  
 452:1  
**liquefying** 414:7  
**liquid** 236:1 257:8,15  
 257:16 302:8 303:5  
 316:13 333:3 362:22  
 367:6 388:3,9 451:8  
 452:7,15 457:1  
 480:10,14 497:19  
**liquidly** 424:10  
**liquids** 452:10  
**Lisa** 1:15 2:3 3:12 9:10  
 18:19 95:18 206:14  
 221:15,18 222:10,22  
 223:7,21 224:5 360:1  
 367:22 374:10,10,14  
 377:10,11,11  
**Lisa's** 222:1  
**list** 2:3 8:9 15:20 18:19  
 19:16 20:1,15 21:6  
 25:22 37:20 40:16  
 82:13,17,22 85:3,5,9  
 143:18 149:8 171:12  
 171:19 207:4 208:21  
 211:3 213:1 215:4  
 217:4 218:16 219:1  
 223:12 233:7 242:10  
 254:11 346:10,13  
 355:11 356:3 359:12  
 369:10,12 371:5,8,11  
 397:2,4,5,9,21 399:7  
 400:11 416:13 434:6  
 435:8,11 437:7,8,17  
 439:8 493:5 495:5  
**listed** 68:5 151:13  
 155:4 369:1 400:2  
 401:3  
**listen** 14:13 227:1  
 331:11 383:6  
**listened** 468:4  
**listening** 100:18 328:10  
**listeria** 465:3  
**listing** 371:16 400:21  
 428:13  
**listings** 33:21 207:3  
 217:13  
**lists** 99:5 437:4,6,14  
 438:5 492:11,17  
**literally** 15:20 16:20  
 121:10 174:4 258:8  
 286:11,20  
**literature** 387:15  
 446:13  
**lithosphere** 284:13  
**Lithuania** 189:15  
**litter** 248:4  
**little** 23:3 60:19 70:11  
 77:22 81:18,20 87:16  
 101:12 107:21 108:22  
 110:3 118:16 119:5,7  
 170:5 184:9 196:17  
 223:5 244:10 250:8  
 254:22 265:14 269:12  
 270:16 305:12 306:7  
 310:8 317:14 329:8  
 340:3 351:2 367:10  
 383:8 388:20 392:13  
 404:2,9 406:18  
 407:13,16 422:19  
 423:12 424:5 445:17  
 451:1 454:14 462:20  
 468:2 476:7 480:13  
 497:6  
**live** 29:1 347:11 364:10  
 365:13 411:15 481:12  
**livelihoods** 379:7  
**lives** 95:15 306:10  
 411:9 470:14  
**livestock** 8:15 10:16  
 11:12 68:15 113:18  
 115:2 208:7 211:6,15  
 211:22 233:1,7 234:6  
 234:18,21,22 286:1  
 286:21 301:16 337:17  
 358:1 359:7,11,17  
 362:12 370:7 371:18  
 396:18,20 397:1,19  
 398:5,8 435:9,20  
**living** 275:19 284:12  
 285:21 323:22 327:16  
 337:5  
**load** 118:14 121:6,12  
 123:7 124:15 125:8  
 216:15 263:11 402:14  
**loaded** 225:16  
**loading** 261:19  
**loads** 119:16  
**lobbied** 438:1  
**lobbyists** 356:1,5  
**local** 389:12 456:18  
 473:14,15  
**locally** 256:17 420:16  
 421:2  
**located** 147:18 256:6  
 258:4 458:11  
**location** 54:9 102:18  
 491:10  
**log** 116:1  
**logic** 294:12 302:12  
**logical** 204:16  
**logo** 276:12 406:22  
**long** 2:13 34:12 35:19  
 66:7 84:9 89:4 92:5  
 121:14 268:20 270:3  
 303:14 308:22 334:18

335:10,18 346:8,12  
 352:1,8 364:3 369:10  
 390:8 392:19 394:9  
 406:13 409:18 412:12  
 450:3 452:13 485:20  
 485:20 497:4  
**long-** 419:7  
**long-standing** 328:6  
**long-term** 111:8 223:13  
 385:22 386:2 419:6  
 475:7 482:22  
**longer** 50:5 55:21 60:14  
 60:21 65:17 125:11  
 125:18 251:14 341:7  
 342:15 388:2 403:9  
 463:21 466:6 487:16  
**longer-term** 323:20  
**look** 15:1 22:7 38:20  
 45:18 57:19 65:12,21  
 72:19 76:9,10,10,18  
 95:20 130:15 135:13  
 135:22 142:22 143:10  
 144:14,22 150:11  
 152:2 154:4,22 156:3  
 157:10 162:11 163:22  
 164:19 171:18 174:9  
 176:1,8 179:14  
 182:21 183:8 184:10  
 184:14 187:19 192:13  
 195:22 198:3,8,12,13  
 244:7 255:6 271:12  
 289:6 335:12 346:19  
 390:15 395:18 437:15  
 439:1 446:14 454:13  
 462:21 463:19 481:20  
 482:9 494:15  
**looked** 362:15  
**looking** 39:14 61:22  
 63:6 65:17 69:10  
 72:13 75:6 79:5 80:22  
 84:2 93:9 113:4,17  
 138:14 142:4 143:9  
 153:11,16,21 155:20  
 156:8 175:16 188:11  
 190:22 195:18 196:14  
 199:11 202:3 204:10  
 205:17,20 239:15,21  
 300:7 342:6 349:19  
 367:13 384:16 386:13  
 399:9 407:8 416:10  
 418:9 497:22  
**looks** 87:18 125:10  
 142:18 146:5 163:20  
 218:11 288:9 310:16  
 310:19  
**loop** 182:11  
**Los** 122:20  
**lose** 379:7,7 380:20

459:13 478:20 486:2  
 488:9,10  
**loses** 378:19 380:9  
**losing** 271:20  
**loss** 98:16 255:4  
**lost** 266:11  
**lots** 25:12 88:6 127:9  
 157:3 160:6 161:17  
 243:3 245:11 319:22  
 429:12 455:7  
**love** 13:8 92:8 96:14  
 321:6 414:17 458:22  
 488:17  
**Lovelock** 283:16  
**lovely** 465:6  
**loves** 96:3  
**loving** 361:14 499:5  
**low** 246:17 424:5  
 495:14 498:13  
**lower** 23:3 144:22  
 404:16  
**lucky** 35:10  
**lunch** 102:14,17 192:5  
 201:13 206:3

---

**M**


---

**M** 222:22  
**Macias** 3:5 255:18  
 264:5,6 266:21 267:7  
 267:18 268:4  
**macral** 360:17  
**mad** 426:8  
**Maddie** 347:22  
**Madison** 3:3 339:12  
 347:18,19  
**magazine** 440:13  
**magic** 450:14,16  
**magically** 314:11  
**magnitude** 451:6  
 454:19  
**mail** 222:12  
**mailed** 121:12  
**main** 263:1,2  
**Maine** 327:19 363:19  
**maintain** 27:8 28:22  
 394:17 406:8 421:19  
**maintained** 270:15  
**maintaining** 105:4  
 352:6,9 354:2 480:19  
**maintenance** 34:14  
 112:4 129:19 134:1  
 140:5 170:7,19 171:2  
 345:17  
**major** 53:19 113:20  
 130:9 139:8 140:2  
 253:14 340:6,8,10  
 341:4,5,14 395:9  
**majority** 22:21 24:11

215:6 216:22 238:5  
 397:12 422:1 442:14  
 460:13 480:22 489:4  
**makers** 335:19 336:10  
**making** 5:13 27:6 71:16  
 79:6 111:7 226:14  
 230:9 259:19 268:19  
 269:7 273:12 290:16  
 293:2 337:5 354:7  
 357:7 373:1 405:2,2  
 450:2 500:22  
**man** 101:20 326:4  
 383:1 488:4  
**man-made** 333:14  
**manage** 285:22 341:20  
 458:11 476:3 479:12  
 481:4 485:11 486:20  
 488:16 496:22  
**managed** 286:7 313:22  
 330:19 475:13 477:20  
 479:10  
**management** 20:16  
 37:18 39:9 54:21 55:9  
 55:11,13,17 59:7  
 71:12 90:14,16 106:5  
 106:19 124:6 145:16  
 148:2 149:17 254:9  
 314:6 331:1 377:1  
 429:2 441:22 442:6  
 475:9 477:3  
**manager** 2:3 18:20  
 55:18 89:8 293:15  
 396:12 441:12  
**managers** 18:6  
**managing** 62:1 384:6  
 476:20 479:12  
**mandated** 171:14  
**mandates** 442:12  
**mandatory** 141:18  
 143:7 194:20 220:4  
 398:11,12,12  
**mangoes** 149:18  
**manifest** 132:18  
**manipulate** 500:13  
**manipulating** 501:2  
**manner** 41:17 61:14  
 359:5 468:22 469:1  
 476:12 480:1  
**manpower** 121:21  
 138:13  
**manual** 61:22 62:9,15  
 97:6 128:17 135:9  
 151:10 152:18 224:10  
 227:2 373:5  
**manuals** 150:15 154:21  
**manufacture** 228:17  
 234:1  
**manufacturer** 372:14

372:21 374:1  
**manufacturers** 227:17  
**manufacturing** 228:1  
 372:16  
**manure** 246:7,10  
 262:10 314:14 413:12  
 413:13,15 414:1,3,11  
 449:19 450:1 451:20  
 464:21  
**manuring** 377:3  
**map** 137:11 454:14  
**Maranville** 3:5 227:11  
 231:6,8,9,12 233:14  
 233:17 234:2,8,14,19  
 235:5  
**Marble** 283:9  
**March** 147:6  
**marching** 148:9  
**Marian** 2:12 268:6  
 273:19,22  
**Marian's** 287:7,18  
**marine** 213:19  
**Mark** 3:3 282:22 347:18  
 354:11,12,15 357:15  
 357:18,21 358:4  
 360:9 363:4,6  
**marker-** 435:5  
**market** 9:11 36:7  
 114:22 115:1,21  
 117:12 144:16 148:13  
 148:21 149:4 160:21  
 272:8 278:1 280:15  
 327:12 354:17 378:3  
 402:8 403:11,15  
 405:14 407:9 420:18  
 492:1  
**marketer** 378:18 407:5  
**marketing** 2:18,19 5:11  
 13:11 15:18 16:3,12  
 16:14 104:4 105:9,9  
 105:14,17 107:2  
 108:3,11 111:18  
 114:11 115:5 116:11  
 116:16,18,20 117:2  
 117:16 125:17 131:17  
 145:2 203:15 223:3  
 316:5 327:8 361:18  
 378:2 470:3  
**marketplace** 94:19  
 270:9 288:9 290:11  
 320:22 402:21 421:13  
**markets** 389:8 438:11  
 458:15 459:10,21  
**marking** 357:8  
**Mars** 285:14  
**Mary-Scott** 3:11 255:14  
 255:16,22  
**Maryland** 144:13

**mass** 27:4 79:8 165:9  
187:17 189:9 197:20  
198:22 457:5 486:8  
**Massachusetts** 458:12  
**masses** 469:13  
**massive** 483:1 497:11  
**master's** 264:7  
**mastered** 223:18  
**match** 120:22 187:21  
204:21 316:8 475:22  
**matching** 314:20 477:5  
**material** 153:17 209:1  
211:8 214:17,21  
215:2 231:16 232:16  
232:17 233:20 317:3  
317:6 355:11 370:15  
370:16,19 371:10  
372:6 387:22 397:8  
399:7 437:8 450:12  
492:11 497:8  
**material-** 293:13  
**materials** 2:5 4:15 8:16  
11:15 18:20 66:4  
79:17 82:12 83:5 86:6  
87:1 200:10 206:13  
206:18,22 207:3,7,8,8  
207:13 208:16 211:1  
215:17,19,22 216:3,6  
216:10,14,16,20  
217:3,3,12 230:12  
254:10 263:18 265:20  
267:3,4 293:14 297:9  
314:13 356:2 368:5  
368:19,22,22 369:1,4  
371:14,22 372:3  
373:4,18 384:2,17,19  
385:1 396:11,17  
397:6 399:2,13 400:2  
437:6 452:11 495:20  
496:3  
**math** 430:18  
**matrix** 99:4,7,16  
**Matt** 108:4 113:14  
157:5 166:5 169:11  
179:11 190:18 193:22  
**Matt's** 189:18  
**matter** 103:11 170:1  
176:1 183:4 189:21  
190:21 193:15 195:2  
206:7 237:22 244:6  
273:8 301:12 329:15  
393:11,12 417:21  
445:20 485:22 486:2  
486:21 487:1 490:4  
501:3,20  
**matters** 33:14 37:1  
226:1 244:5 249:10  
451:7

**Matthew** 2:19 106:6  
144:5,10 155:7,10  
156:2  
**mature** 316:20  
**maturity** 117:4  
**max** 231:21  
**maximizing** 32:2  
**maximum** 186:7 340:17  
**McAvoy** 179:19  
**McEvoy** 5:18  
**Meadow** 3:9  
**Meadows** 409:10  
**meal** 236:19 262:14  
265:19,19,20 267:1  
267:11 423:5 424:4  
426:2,2,6,8  
**mean** 64:8,12 69:3 87:1  
109:16 112:11 119:10  
125:15 226:22 232:18  
244:20 260:15 262:15  
266:10 277:6,18  
280:22 317:15 327:2  
328:21 332:17 333:9  
333:21 336:11 350:22  
353:2 367:11 390:20  
425:4,7 426:19  
428:16 440:2 456:5,6  
467:18 470:16 478:12  
478:18 479:6,9  
480:17 483:7 485:2  
485:12,18,19 486:14  
489:18 490:3,5 494:8  
**meaning** 357:7 462:12  
**meaningful** 5:22 477:8  
**means** 64:13 123:17  
148:5 243:6 288:19  
301:21 337:4 348:16  
354:2 365:21 390:15  
390:16 402:5,6  
409:17 439:2 440:17  
462:11 474:4 486:12  
**meant** 269:19 303:18  
323:21,22,22 341:14  
**measures** 201:2  
**meat** 113:17  
**mechanics** 174:10  
224:19 452:8  
**media** 101:3 237:18,20  
237:21 362:22 446:1  
450:4 451:9 452:10  
454:7,9,10 455:1,8  
456:2,13 457:3  
486:22  
**medical** 11:3 397:15  
**mediums** 460:17  
**meet** 18:5 37:4 87:4  
88:21 117:3,18 118:2  
119:3,4 138:3 139:4

186:13 195:14 209:14  
218:7 257:6 303:21  
349:21 354:5 376:14  
402:9 405:2 434:3,18  
442:15 443:12,17  
447:15 465:5 469:19  
483:22  
**meeting** 1:5 5:7,17 6:8  
6:12,17 7:15 12:8  
14:22 15:3 92:5,13  
95:2 99:3,6 101:4,8  
102:16 103:4 156:11  
166:7 190:13 206:21  
207:3,5 208:13 209:9  
210:5 212:8 213:11  
213:20 214:3,12,15  
215:17 216:18,18  
217:12 218:4 228:16  
229:9 269:13 291:8  
309:10 313:5 323:8,9  
329:14 334:12 353:19  
354:19 367:17 369:8  
391:18 434:2 458:19  
**meetings** 5:17 20:2,4  
21:3 144:12 206:20  
210:2 211:16 213:22  
217:14 246:18 268:14  
365:2 369:15 432:1  
464:5 465:5  
**meets** 120:4 123:20  
485:14  
**Melody** 3:6 241:12  
251:5,7,9  
**member** 6:17 8:19 10:3  
98:5,11,12,21 227:19  
309:11 313:13 330:7  
366:18 372:3 382:9  
**members** 7:20 9:1,3  
14:9 18:9,14 83:4  
96:11,12 97:7,18,21  
99:5,6,20 100:2,18,21  
102:14 103:22 105:6  
107:16,18 108:1  
140:13 141:11 166:12  
166:22 215:10,13  
223:13 225:12 226:1  
338:4 339:18 341:18  
348:10 358:13 382:10  
395:8 396:15 427:18  
429:9 432:8 477:16  
**membership** 215:14  
359:20  
**memo** 52:13 162:14  
214:9,13  
**memorandum** 45:7  
83:2 144:2  
**memory** 332:15  
**men** 411:8

**mental** 63:17 360:12  
**mention** 7:4 16:10  
75:10 92:11 155:21  
294:10 298:22 369:6  
**mentioned** 39:3 45:14  
57:4 62:2 67:22 75:19  
76:17 80:20 95:14  
124:19 132:4 136:2  
137:1 138:20 139:9  
141:4 144:1 146:9  
154:15,19 155:10  
159:1 160:3 171:3,7  
171:21 193:7 203:10  
223:15 245:4 253:18  
278:13 279:16 298:6  
302:15 381:3 386:22  
400:19 404:4,14  
411:6 413:5 425:15  
496:2  
**mentioning** 142:2  
**mere** 357:8  
**merely** 316:2 452:14  
**merged** 141:6  
**merits** 316:6  
**Merrigan** 365:5  
**mess** 366:4  
**message** 44:1,2,8 46:6  
46:7 112:7,12 115:18  
126:21,22 127:5  
136:5,5,7 141:17,18  
142:9 159:6,8 160:4  
168:16 174:5,8  
176:22 182:18 193:16  
194:8 292:18 359:16  
383:5 477:13  
**messages** 116:6  
**messaging** 143:16  
**met** 1:8 121:6  
**meta-analyses** 445:7  
**metaphor** 305:21  
**methionine** 21:15 81:19  
**method** 230:5 233:22  
236:10 254:5 256:14  
288:4 315:22 316:5  
351:12,15 352:7  
476:18  
**methods** 93:21 252:7  
259:12 260:19 277:14  
306:11 316:8 348:21  
349:2 435:5,8 442:5  
460:18 461:3 499:22  
**methyl** 151:15  
**Mexican-based** 264:8  
**Mexico** 158:8 361:5  
**Meyer** 3:6 241:13 251:6  
251:9,9 255:8,12  
**Miami** 153:6  
**mic** 131:6 363:16 463:2

- Michael** 2:12,13,15,18  
105:8,13 130:17,21  
167:3 184:8 203:13  
374:10 377:13,14,17  
380:8 381:2 389:2  
392:4,5 394:19 416:7  
420:10,11,13 425:11
- Michael's** 155:8
- Michelle** 2:2 18:22  
95:18 130:18 225:1  
225:15,17 226:13  
269:16
- Michigan** 472:19  
473:18,22 488:13
- microbe** 229:3
- microbes** 266:7 267:13  
341:15 342:7 465:21  
486:4
- microbial** 481:11  
495:13 500:7
- microbiology** 271:21  
273:10 386:18
- microgreens** 457:9
- microns** 232:9
- micronutrients** 229:2  
248:3 428:13,17,19
- microphone** 358:8
- microphones** 276:21
- mid-80s** 365:4
- middle** 3:8 389:6 432:5
- middleman** 495:13
- midterm** 56:4
- midterms** 57:9,14
- mightily** 331:15 332:7
- Mike** 131:7,19 132:4  
134:5 139:9 142:2  
157:6 160:3 166:5  
169:10 170:5 171:7  
392:8 394:22
- mile** 365:2
- miles** 5:18,20 95:10  
323:9 391:1 473:11
- Miles'** 59:21
- Miles's** 95:7,15
- milk** 40:18,20 77:7,17  
77:20 399:3 449:21
- milked** 417:1
- millennial** 350:4,17
- milling** 232:7
- million** 34:4 92:11  
126:13 188:13,13,15  
313:19 361:2 364:14  
408:13,14 453:2
- millions** 315:20 403:13
- mind** 185:22 239:1  
268:21 360:22
- mine** 109:7 231:16  
309:14 445:19
- minerals** 245:12 267:1  
316:18 341:2
- minimal** 233:12
- minimize** 233:10
- minimizes** 233:9
- minimum** 115:7 117:3  
117:18 120:4 186:6  
252:16
- Minnesota** 427:10,11
- minor** 170:10 412:20
- minority** 237:16 318:21  
359:21,21 360:3  
482:10
- minute** 102:19 114:13  
116:7 123:6 127:3  
274:11 285:3 374:19
- minutes** 12:7,20 224:21  
226:20 227:9 228:15  
251:7 301:1 325:14  
326:1 329:9 360:11  
363:14 382:13 432:19
- Mirenda** 3:6 363:13  
368:3,4 369:22 370:9  
370:21 371:18 372:13  
373:15 374:8
- mis-mix** 311:20
- misconception** 374:5
- misconceptions**  
228:16
- Miskell** 3:7 313:9 322:2  
322:5,6 324:14,21  
325:4 352:15
- Miskell's** 3:7
- mis-labeled** 187:8
- mislabeling** 187:12  
422:3
- missed** 95:10 428:12
- missing** 56:20,20
- mission** 16:14 144:15  
145:10,12,17 169:22  
256:12,20 380:20  
381:1
- missions** 106:3 133:6  
140:10
- Mississippi** 10:7 301:5
- Missouri** 11:9 77:10  
405:16 451:16
- mistake** 366:5,9
- misunderstood** 440:20
- misused** 197:12
- mites** 211:20 233:9,10
- mitigate** 444:7
- mitigation** 149:17
- mitigations** 149:13
- mix** 208:17 253:11  
260:3,3 262:20 454:3  
485:18 498:5 499:17
- mixed** 10:14 267:5  
268:1 388:19
- mixing** 191:5,5
- mixture** 266:22
- mode** 17:5 445:12
- model** 69:11 144:16  
146:10 452:16
- modeling** 225:18
- modern** 259:10 283:12
- modernization** 34:4  
112:5 463:16
- modifications** 86:21
- modified** 287:9,16,19  
287:21 289:3,11
- modifying** 396:2
- Module** 37:9
- MOFGA** 364:22
- moisture** 423:20 452:9
- molluscicide** 210:8
- molten** 231:22
- mom** 241:22
- MOM's** 9:11 403:15
- moment** 130:18 221:17  
275:5 277:9 281:5  
364:5 452:19
- money** 126:14 168:19  
276:6 461:10
- monies** 147:14
- monitor** 54:16
- monitoring** 139:2
- monitors** 114:19
- mono-culture** 335:5
- Monte** 339:12
- month** 18:11 322:12  
402:18
- monthly** 365:2
- months** 14:1,14 17:12  
27:12 61:9,19 70:18  
71:16 74:11 89:12  
95:2 127:13 157:22  
168:6 173:3 319:21  
404:15 465:1 476:16
- Montpelier** 449:4
- Moon** 2:10,10 301:3  
325:20
- morning** 2:15 5:3 7:21  
8:13 9:10 13:3 16:3  
22:4 31:13 39:16  
104:10,22 105:7  
107:13,16,16,18  
189:10 194:1
- Mortensen** 1:16 10:2,2  
63:9 66:10,19 82:11  
84:6,12,18 90:1,5  
91:9,12,15 188:8  
191:12 261:15 287:7  
288:21 289:16 350:16  
351:7 352:12 360:9  
360:18 363:3 380:8
- 394:22 395:12 423:10  
424:8 445:2 446:9,12  
471:1 498:8,19,22  
499:3,8,12 500:1,10  
501:7
- moss** 485:19 499:11
- Mosso** 1:17 9:17,17  
238:3,10 239:3 250:3  
251:2 482:7,12
- mother** 395:21 458:16
- Mother's** 153:8
- motion** 214:18,19,21  
216:21,22 235:19  
304:16 312:14 328:16  
333:22 366:15,19  
395:15 415:1,8 420:3  
461:19
- motions** 215:5,12
- motivate** 36:21
- motivated** 94:5
- motivation** 103:5
- motivations** 421:4
- motor** 134:16
- motto** 364:10
- MOU** 45:5,6 48:21 83:7  
86:18,21 87:4 179:19  
181:6
- move** 8:5,13,21 12:17  
15:11 21:17 35:18  
66:19 82:12 83:1,6  
91:19 97:3 118:16  
146:18 147:15 156:18  
166:11,22 225:17  
227:7 244:3 250:2  
308:18 320:15 321:22  
329:20 330:2 340:20  
347:15 368:11 403:17  
409:4 411:13 420:9  
454:16 455:17 457:4  
457:15 462:15 469:18
- moved** 17:22 82:16  
93:17 94:2 145:6  
150:3 183:2 231:22  
339:6
- movement** 94:19  
102:15 151:12 335:12  
338:13 353:10 378:15  
441:20 469:6
- moves** 182:17 328:22
- moving** 44:12 51:18  
100:9 108:17 109:8  
111:9 148:12 167:20  
191:9 211:6 212:5  
216:13 340:15
- Moyer** 3:7 377:14 382:5  
382:7,7 385:20 387:9  
387:14 388:13,17
- MRP** 16:15

**much-needed** 442:13  
**muck** 450:14,16  
**muddy** 411:5  
**mulch** 216:9  
**multi-** 361:1  
**multi-faceted** 145:11  
**multi-pronged** 290:14  
**multi-species** 336:3  
**multiple** 22:5 94:9,11  
 136:7 199:12  
**Musgrave** 3:8 433:9  
 441:10,11 444:20  
 445:16 446:11,22  
 447:3 448:1,4,11  
**mushrooms** 383:2  
**mushy** 487:19  
**mutated** 355:2  
**mutual** 33:1  
**mycorrhizae** 316:18  
**mystery** 453:18

---

**N**

---

**N** 4:1,1  
**nailed** 119:8  
**naive** 186:19  
**name** 5:8 13:4 15:18  
 144:10,11 225:20  
 226:5,9 227:12,14  
 231:11 235:8,11  
 241:13,15 251:8  
 253:3 255:19 264:3,5  
 268:7,8 273:21,22  
 276:17 282:19 289:19  
 289:21 308:20 313:9  
 322:3,5 325:18 330:3  
 334:8 339:13 347:20  
 347:21,22 354:13  
 363:15 368:1,3 373:4  
 374:11,13 377:15,17  
 382:6 389:3 392:6  
 396:7,8,11 401:7  
 409:8,9 416:14  
 420:12 427:7 433:10  
 441:8,10 449:2  
 451:17 458:6,9 463:5  
 474:11,14  
**named** 264:9 283:16  
**names** 226:11 227:5,5  
 243:2  
**narrow** 296:6  
**natamycin** 210:6 211:2  
 211:4  
**nation's** 44:14  
**national** 1:3 2:2,3,3,4,5  
 2:6 4:6,15 5:6,10,10  
 5:18 8:9 13:6 18:19  
 19:16 20:1,15 21:6,7  
 21:8 40:16 52:5,9

80:21 82:22 85:3  
 104:1,2,5,14 107:3,17  
 107:20 109:8 111:10  
 126:4 134:13 149:3  
 155:15 206:12 207:4  
 208:21 209:19 210:19  
 211:3 217:4 218:16  
 219:1 221:16 222:5  
 222:14 223:3,12  
 233:7 254:10 268:13  
 277:12 313:2 325:9  
 339:18 345:8 354:20  
 355:11 359:12 365:13  
 369:10 371:5,8,11  
 376:17 397:2,3,9,21  
 399:7 434:5 435:11  
 443:13 468:16  
**Nationalist** 369:4  
**Nativa** 379:21  
**native** 253:17,22 296:2  
 296:7,11,12,20,22  
 297:10 299:8,19,21  
 300:3 390:5,15 491:5  
**natural** 3:4 106:19  
 145:18 237:7,11  
 243:13,13 285:21  
 296:15,19 300:16  
 340:14,15 341:21  
 346:12,20 347:2,7  
 359:5 370:2 371:10  
 384:9 399:1,8 401:8  
 401:13 403:18 444:8  
 444:11 465:13,13  
 490:5 499:11 500:6  
**natural-based** 230:12  
**naturally** 229:11,19  
 231:1 491:3,16,17  
 492:3  
**nature** 226:17 333:13  
 344:13 404:9  
**nature's** 379:21 442:3  
**Naturopathic** 11:3  
**nearly** 390:8  
**neat** 152:21  
**necessarily** 85:11  
 115:6 138:3 174:12  
 179:4 181:11,13  
 187:19 193:10 220:2  
 262:18 374:4  
**necessary** 215:21  
 237:4 271:13 285:1  
 297:10 353:18  
**neck** 261:12  
**need** 22:20 26:11 27:3  
 27:5 36:14 37:4 45:18  
 49:12,13 58:10 60:17  
 63:21 64:7,21,22 67:7  
 72:12 79:6,12 83:2,7

95:1 112:8,17 115:17  
 116:2,2 120:3 122:19  
 129:8,18,22 130:11  
 139:6,14 163:12  
 167:4 170:10 174:19  
 178:18 195:5 198:7  
 215:20 218:1 236:22  
 238:18,20 245:13,18  
 248:3 250:2 252:1  
 253:7,9 262:10  
 285:13 290:13 293:1  
 293:19 295:19 296:5  
 302:22 307:13 319:19  
 320:10 335:12 342:20  
 343:1,7 349:8,20  
 358:12,18 384:11  
 385:5 394:5,16 411:3  
 422:22 424:6 426:14  
 439:1,7 440:13  
 449:20 461:8,11  
 464:12 466:5 468:18  
 469:17 472:5,10,10  
 477:13 483:22 486:19  
 486:20 495:10  
**needed** 20:13 30:3  
 34:17 36:22 80:6  
 99:13 122:15 136:17  
 139:7,20 158:19  
 170:16 228:10 256:14  
 358:14 385:3 410:2  
 418:6 419:8 491:19  
**needing** 285:9  
**needs** 34:9 40:21 46:18  
 46:22 54:5 64:11,19  
 75:20 89:2 112:16  
 125:3 133:16 165:21  
 168:8 228:21 230:13  
 236:10 239:20,21  
 240:4,10,12 248:13  
 248:22 249:21 258:22  
 270:15,20 276:8  
 307:12,19 308:9  
 350:1 366:9 427:2  
 455:8 461:3 468:18  
 481:11  
**negative** 327:9 330:21  
 434:15  
**negotiates** 42:6  
**neighbors** 100:11  
**neither** 236:19  
**net** 298:21 299:12  
**Netherlands** 274:2,20  
 275:15 278:1,15  
 280:7,9,14 287:8  
 289:14  
**network** 147:22  
**networks** 161:3  
**neutral** 188:21

**never** 111:6 199:8  
 200:16 232:14 296:8  
 300:13 313:4 355:15  
 436:20,22 453:10  
 456:20 464:18 465:4  
**new** 2:15 3:8 4:16 15:21  
 17:9,22 20:14 25:3,21  
 29:14 35:15,16 37:6  
 39:6 41:1 43:22 47:9  
 57:9,18 70:8 73:8  
 78:11,12,18 79:1,3  
 80:2,21 82:17 83:14  
 84:4 95:21 106:16  
 108:20 123:12 124:1  
 129:21 147:21 163:11  
 164:12,20 168:16  
 179:14 185:14 206:13  
 209:16 210:20,21,21  
 214:4 219:18 220:3  
 220:10,21 221:4  
 223:14 253:4 254:17  
 254:22 259:7 270:2  
 347:4,21 351:18  
 384:13 389:6,6,7,10  
 390:6,11 406:12  
 408:17 413:16 421:22  
 463:15 474:20 475:4  
**newly** 24:20 147:10  
**Newmark** 324:8  
**news** 114:22 115:1,21  
**newspaper** 209:5  
**Nexight** 219:16  
**next7.org** 3:12 374:15  
**NFT** 452:3 467:17  
**NHTSA** 134:14  
**nice** 18:4 317:5  
**niche** 410:5  
**nicotine** 370:1,18 371:9  
**night** 91:21 103:3  
 305:14 416:11 450:11  
**nine** 41:20 63:21 89:12  
 126:21  
**nine-month** 319:22  
**ninth** 50:19 393:13  
 401:12  
**nip** 429:15  
**nitrate** 236:16 260:19  
 262:14 317:7 443:1,3  
 443:9 476:2,20 477:5  
 494:19 495:1,10  
**nitrification** 472:3  
**nitrogen** 235:22 236:2  
 236:4,15 257:7,9  
 262:15,17 263:1,3  
 266:5,5,9,13 311:19  
 316:20 318:10 319:19  
 442:19 443:7 475:22  
 476:4,6,15 477:2,4

479:5 480:10,15  
 483:22 484:2 487:10  
 487:12,14 488:6  
 494:14,21,22 495:6,6  
**nitrogen-fed** 318:7  
**Nobel** 287:1  
**NOC** 291:8  
**nodding** 175:13  
**NOFA** 348:14  
**NOFA-VT** 3:3  
**nominated** 221:22  
 222:1  
**non-** 252:4 369:4 439:9  
 439:12  
**non-acid** 500:15  
**non-agricultural**  
 368:10 369:5  
**non-binding** 309:20  
**non-certified** 70:22  
**non-chemical** 151:15  
**non-competitive** 128:1  
**non-compliance** 181:7  
**non-disclosure** 220:18  
**non-equivalencies**  
 173:15  
**non-GMO-certified**  
 327:20  
**non-liquid** 316:14  
**non-organic** 201:1  
 213:3 434:22 437:10  
**non-profit** 433:14  
**non-retail** 291:6,19  
**non-retail-labeled**  
 294:20  
**non-substantial** 366:19  
**non-synthetic** 368:11  
 368:15 371:19  
**nonagricultural** 215:1  
**nonanoate** 209:10  
**noncompliant** 28:8  
 32:17  
**nonconformances**  
 53:19  
**nonsynthetic** 214:22  
**Noonan** 3:8 382:5  
 389:2,5,6  
**NOP's** 41:3 99:12  
 168:19 239:11 254:16  
 293:20 295:16 365:18  
**normal** 219:10 465:20  
**normally** 348:8 478:12  
**Northeast** 348:1  
**northeastern** 11:18  
 491:3  
**northern** 241:17 287:8  
 363:19  
**NOS** 376:16  
**NOSB** 2:2 4:11 7:14

14:9 19:18 20:2,4  
 22:1 31:11,14 52:13  
 80:1 83:5 85:1 86:19  
 91:19 96:10 97:5,7,18  
 97:21 98:17,21 99:5  
 156:10 162:13,16,19  
 167:7 186:22 206:20  
 207:20 208:1 217:17  
 228:11,16 239:16  
 252:14 253:10 259:10  
 268:14 276:14 282:18  
 296:3 297:5,6 309:17  
 323:8 355:11 356:2  
 366:1,18 369:8 382:9  
 382:10 383:10 389:17  
 390:1,5 392:16  
 394:10,11 401:10  
 408:11 429:5 431:7  
 431:11,19 436:6  
 463:20  
**NOSB's** 368:20 371:7  
 428:20 435:20  
**note** 51:13 53:3 336:5  
**noted** 30:12 157:13  
 232:22  
**notes** 42:17 167:2  
**notice** 150:3 152:8  
 154:18 181:17 192:4  
 210:11  
**noticed** 184:3 203:13  
 297:19  
**noticing** 182:9  
**notification** 178:22  
 179:4 185:12 202:12  
**notifications** 143:17  
 183:11  
**notified** 47:18 48:15  
 120:1  
**notify** 50:1,3 180:19  
**notifying** 60:12,18  
 180:21  
**notwithstanding**  
 226:21  
**nourishing** 301:11  
**November** 52:14  
**now-expired** 442:22  
**NSOB** 458:18  
**nuance** 300:7  
**nuanced** 93:20,22  
**number** 17:20 31:6  
 41:10,12,15 54:9  
 83:20 118:9 130:2  
 168:6 187:13 190:16  
 207:11 208:14 210:3  
 218:16 247:14 260:11  
 266:6 298:5 309:5  
 322:22 360:10 374:16  
 395:1 407:15 426:12

454:1 457:9 482:21  
**numbers** 22:8,20 73:15  
 96:5 127:6 190:5  
 360:3 490:6  
**numerous** 105:16  
 428:9  
**nurture** 304:11  
**nurtured** 314:15  
**nurturing** 302:20  
**nutgrass** 417:20,22  
**nutrient** 32:20 33:8  
 75:22 228:12 236:18  
 236:21 238:15 245:18  
 248:21 249:21 260:18  
 262:19 310:22 311:7  
 320:6 333:2,7,11,13  
 384:22 385:17 388:20  
 423:14,18 425:9  
 427:2 465:3 466:2  
 471:21 479:17  
**nutrients** 237:9 245:14  
 263:15,18 265:11  
 266:3 303:5,17 318:2  
 318:10 333:4 362:15  
 377:5 472:4,6  
**nutrition** 237:11 267:8  
 357:1 402:11 403:5  
 456:22 475:12  
**nutritional** 317:18  
 362:11 387:6  
**nutritious** 257:2 330:20  
 362:3 375:7 406:3  
 442:2

---

**O**

---

**O** 4:1  
**o'clock** 416:9,11  
**Oakley** 1:17 11:17,17  
 70:5,19 234:10,16  
 246:18 254:21 263:6  
 278:21 293:7,11,16  
 297:19 304:15 312:12  
 318:16 328:14 333:20  
 334:3 342:18 352:14  
 366:13 395:14 399:22  
 400:6 414:22 415:6  
 419:21 420:2 424:18  
 461:16 489:2,7  
 490:22  
**Oakley's** 498:12  
**oasis** 286:12,14  
**oats** 413:14  
**Obama** 84:8 355:10  
**objected** 432:2  
**objection** 12:14,16  
**objective** 434:9  
**objectivity** 98:11  
**obligation** 379:11,12

**obliged** 495:2  
**observable** 254:6  
**observation** 344:10  
**observe** 7:14  
**obsolete** 369:12  
**obtain** 120:19  
**obtained** 141:5  
**obtaining** 152:1 442:17  
**obvious** 242:2  
**obviously** 62:11 125:19  
 134:6 319:9 359:3  
 447:4 485:13 486:4  
**Occasionally** 249:19  
 371:21  
**occur** 54:11 56:3,4  
 139:2 152:14 214:17  
 300:15 475:19  
**occurred** 137:4 141:3  
 253:14 432:1 453:11  
**occurring** 229:19 231:2  
**OCIA** 177:15  
**octanol** 208:18  
**OCTOBER** 1:7  
**OFA** 427:17,17  
**offer** 189:19 190:18  
 294:4 404:15 427:20  
**offers** 254:4  
**office** 4:7 13:21 17:22  
 19:9 39:21 40:2 54:10  
 55:9,11 63:3 83:21  
 90:13,16,17 91:8  
 99:13 105:22 106:10  
 124:22 125:3,6 144:3  
 144:13 176:4 177:8  
 256:8 365:6  
**Officer** 74:18  
**officers** 8:20 147:7  
**offices** 28:1,2 55:12  
 125:2  
**official** 2:7 5:16 45:1  
 203:19  
**officially** 5:5 34:13  
 133:1 137:4  
**officials** 45:9,17 49:8  
 230:7 463:18  
**offshore** 146:15 151:5  
**offsite** 102:16  
**OFPA** 172:4 207:21  
 253:15 268:20 271:2  
 273:15 302:14,18  
 303:11 323:16 356:10  
 357:13 363:10 365:7  
 365:14,18,19,22  
 366:10,16,17,21  
 376:21 427:22 428:8  
 434:19  
**Ohio** 386:8  
**OID** 68:22

**OIG** 40:2,2,6,8 41:6  
42:9,13 44:22 45:16  
46:9,14 47:3 48:12,13  
49:6,14 50:8,9,13,20  
51:10 64:6 65:10 66:4  
156:19 159:3 160:6  
167:9 172:17 173:22  
**OIG's** 51:7  
**oil** 335:10 355:2,14  
**Oklahoma** 11:18  
450:22 491:4  
**Olam** 9:18  
**old** 2:15 22:1,2 232:1  
283:10 299:3 350:21  
401:13 420:14 423:6  
426:7 449:10,10  
453:4 485:19 501:5  
**old-fashioned** 309:16  
**older** 306:7 353:15  
409:17  
**Ole** 10:6  
**Omaha** 16:1  
**omega-3** 74:14  
**omega-3s** 77:13  
**Omni** 1:9  
**OMRI** 3:6 232:20 260:1  
368:5,13 370:22  
372:14,18,20 373:2  
373:17  
**OMRI's** 370:8,10  
**on-the-ground** 164:3  
189:13  
**onboard** 84:4,20  
338:14  
**once** 23:8 48:16 77:16  
82:5 98:19 127:15  
138:16 139:21 141:9  
143:5,8 159:13 169:2  
170:14 174:10 176:9  
194:19 212:3 215:2  
219:5 225:7 238:20  
266:5,9 391:3 397:13  
423:13  
**one-size-fits-all** 252:20  
**one-to-one** 384:12,16  
384:21  
**ones** 93:22 186:11  
218:9 223:14 278:16  
371:15 399:18 432:6  
**ongoing** 53:14 84:16  
111:22 112:5 137:3  
153:12 170:6 196:13  
205:16 293:3  
**online** 15:5 25:11 29:16  
40:4 219:7 254:18  
**onsite** 30:9 41:15 50:10  
56:9 76:7,8  
**open** 30:16 33:18 60:2

81:5 83:3 89:5 105:10  
107:11 162:20 166:19  
173:11 235:13 268:2  
306:10 402:4 437:11  
444:15 482:20 483:10  
485:9  
**opened** 128:9 162:13  
**opening** 5:5 107:6  
151:3  
**operate** 449:4  
**operated** 256:7 463:10  
**operates** 26:14  
**operating** 27:21 54:17  
55:5 164:8 167:13  
182:3 193:18 199:13  
199:14  
**operation** 11:20 30:21  
37:16 38:22 64:12  
68:11 158:14,18  
162:11 175:21 181:12  
197:17 198:1,19,20  
199:12 200:22 201:20  
250:4 290:22 320:21  
372:12 380:16 406:4  
406:6 448:8 472:17  
472:21,22,22 484:14  
489:20 497:11,13  
**operational** 149:15  
150:19 151:2,7  
**operationally** 150:14  
**operations** 22:12,13,22  
24:6,10,12,15,16,20  
26:1 27:14 30:10,11  
32:4 34:13 38:12 40:8  
61:18 64:14 65:3  
69:15 70:22 92:10  
104:17 112:4 129:19  
134:1 140:5 158:8  
170:7,18 171:1  
173:18 174:1 194:4  
199:17 201:21 264:15  
274:15 278:4 290:4,6  
294:13 315:10 320:21  
324:20 325:1 335:6,9  
336:15 356:16 364:16  
371:22 381:5 384:4  
389:9 396:13 397:5  
399:14 402:20 404:6  
404:14 429:7 451:16  
496:9  
**opinion** 270:21 316:1  
318:18 319:2 342:22  
385:16 481:20  
**opinions** 302:6  
**OPM** 90:11,13  
**OPP** 84:17  
**opportunities** 19:22  
53:21 73:12 115:7

353:6  
**opportunity** 81:13  
104:19 166:14 183:3  
226:8 235:16 287:11  
293:5 339:16 348:5  
361:14 377:17 398:19  
399:1 402:11 441:13  
444:6 454:17 455:4  
458:21 460:9 462:6  
474:15 489:19  
**oppose** 359:15 451:8  
**opposed** 231:15 232:1  
242:12 244:11,18  
304:17 372:20 394:6  
436:2,3  
**opposite** 289:9 350:5  
421:22  
**optimal** 284:3  
**option** 38:21 55:15  
152:17,19 265:1  
305:17 390:12 425:3  
**optional** 37:8 398:11  
**options** 31:9 47:20 48:8  
56:8 65:4 152:15  
162:9 305:3 390:11  
494:1 495:7  
**oral** 15:6 360:22  
**orange** 272:4  
**oranges** 260:16 415:12  
**orchard** 479:14  
**orchards** 47:15  
**order** 2:18 4:2 63:22  
83:1 105:9,14 108:11  
116:11,20 117:16  
125:18 133:8 137:1  
206:11 215:6,11  
216:14,22 243:19  
270:16 276:16 373:17  
448:13,17  
**ordered** 355:8,19  
**orders** 105:17 114:11  
115:5 116:18 203:15  
451:6 454:19  
**Oregon** 282:22  
**org** 144:19 145:7,9  
**Organic's** 271:8  
**organic-specific**  
183:12  
**organically** 256:13  
299:6 301:7 330:19  
346:8 385:1 386:4  
387:7 420:15 432:11  
499:22  
**organically-approved**  
314:13  
**organically-certified**  
320:17  
**organically-managed**

301:18  
**organics** 2:11 3:7,11  
10:7 21:8 239:7 242:5  
264:10 308:16 343:2  
345:8 357:7 361:8,9  
377:22 379:22 405:20  
431:9 441:11 470:5  
470:11  
**organism** 286:21  
**organisms** 145:14  
284:7,12 482:21  
**organization** 6:10 77:8  
144:6 149:3 186:1  
220:1 274:3 370:12  
379:4 433:14 438:1  
**organizational** 16:9  
99:1  
**organizations** 190:7  
379:18  
**organize** 285:19  
**origin** 150:20 152:20  
**original** 392:1  
**originally** 170:15,21  
**originator** 330:14  
**ornamentals** 236:6  
275:22  
**OSPs** 295:20  
**OTA** 251:15 356:6  
**OTA's** 251:22  
**outages** 140:19  
**outbreak** 148:6  
**outbreaks** 148:6  
**outcome** 185:6 276:3  
421:22  
**outcomes** 109:4 252:15  
**outdoor** 250:12 315:2  
315:10 355:18 412:21  
426:22 460:21  
**outdoors** 384:10  
**outer** 269:15  
**outermost** 284:5,16  
**outgoing** 8:18  
**outlaw** 281:19  
**outlined** 148:15 291:5  
**outlining** 45:13  
**output** 490:18  
**outreach** 130:8  
**outside** 91:5 98:22  
100:13 102:21 159:16  
329:21 330:2 419:17  
425:15 429:10 431:4  
**outstanding** 4:16  
206:14 222:6 223:2  
**over-application** 477:2  
**over-used** 444:8  
**overall** 33:22 53:17  
71:12 112:13 145:17  
246:3 452:9

**overarching** 182:20  
**overcome** 467:15  
**overlap** 131:12 493:20  
 493:21 494:3  
**overlooks** 230:13  
**overly** 443:17  
**overnight** 194:21  
**overriding** 378:9  
**overruled** 356:6  
**oversaw** 111:20  
**oversee** 111:22  
**overseeing** 29:18  
 162:18 204:17  
**overseen** 169:16  
**oversees** 26:22 105:15  
 118:7 175:21  
**oversight** 29:7 32:11  
 41:3 62:18 104:3,16  
 124:11 138:22 143:15  
 161:19 162:3 166:16  
 294:10 461:3  
**overspray** 285:9  
**oversupply** 77:7  
**overturned** 355:19  
**overview** 4:3 13:12,21  
 53:16 63:10 105:11  
 132:3 142:11 164:14  
 206:18  
**overwhelmingly** 309:21  
**owe** 173:22  
**owned** 110:4 313:21,22  
 463:10  
**owner** 120:13 256:10  
 463:7  
**ownership** 161:11  
**owns** 66:1  
**Owusu** 432:8  
**oxalic** 211:19  
**oxidative** 230:3,8  
**oxidized** 229:17  
**oxymoron** 420:22  
**oxytocin** 337:21 358:5  
 358:10 359:1,11  
 396:22 397:3,6  
 398:22 435:10  
**ozone-depleting**  
 134:11

---

**P**


---

**P** 156:10  
**P-R-O-C-E-E-D-I-N-G-S**  
 5:1  
**p.m** 102:7 206:8,9  
 329:16,16 501:21  
**pace** 143:4  
**package** 233:20 291:11  
 462:20  
**packaged** 232:12

291:17,18  
**packaging** 214:6,10  
 291:10  
**packers** 145:6  
**page** 25:22 140:21  
 154:17 293:20  
**paid** 250:14  
**pallet** 118:10  
**panel** 4:13 8:5 22:4  
 31:12 39:16 52:11  
 67:18 89:7 91:6,14  
 103:8,17 104:19  
 105:6,11 148:17  
 156:12 166:11 192:5  
 205:17,18  
**panelists** 106:20 205:8  
**panelists'** 130:15  
**panels** 91:4  
**paper** 111:9 119:12,13  
 119:16 120:9,12,15  
 120:20 121:2 122:5  
 142:7 184:11 190:17  
 209:5  
**paper-based** 197:6  
**paperwork** 45:20  
 184:14,20 185:1,20  
 197:16 198:17  
**para** 370:6  
**paragraphs** 398:10  
**parallel** 289:8,12  
 293:22  
**parameters** 244:22  
**parasiticide** 370:7  
 397:18 398:13  
**parasitoides** 396:19  
 398:4,7  
**pardon** 110:9  
**parentheses** 440:11,14  
**parents** 102:12 304:9  
**Paris** 277:10  
**parking** 102:17 455:7  
**part** 5:11 16:11,13  
 20:15 24:14 33:8  
 34:18 40:9 47:7 57:1  
 59:1 61:17 66:1,2  
 67:19 75:22 79:11  
 85:8 104:12 105:3  
 130:20 135:11 158:12  
 165:18 172:17 174:21  
 175:3 182:16 196:20  
 199:17 200:5 205:16  
 205:19 212:7 215:17  
 216:11 217:17 218:5  
 219:9 228:19 233:2  
 242:3 245:18 246:10  
 249:5 257:21 270:3  
 271:2,8,9 281:21,22  
 350:6 367:12 371:3

399:7 407:17 422:2  
 430:5 436:22 455:22  
 486:21 499:15 500:13  
**partial** 191:5  
**partiality** 98:16  
**partially** 456:10  
**PARTICIPANT** 408:2  
**participate** 7:14 20:20  
 86:12 239:9 336:17  
 453:17  
**participating** 14:21  
 111:11 139:6 142:13  
**particle** 232:8  
**particular** 75:9 81:8,9,9  
 97:11,21 128:5 165:4  
 218:14 334:15 404:12  
 476:13 480:3,21  
 485:2,12  
**particularly** 165:15  
 346:19 485:10 490:2  
 492:19  
**parties** 280:2  
**partly** 249:3  
**partner** 31:7 48:13  
 110:15,17 130:9  
 132:15 133:5  
**partnered** 28:3  
**partners** 47:6 50:18  
 130:22 133:13,13  
 134:5 155:9 156:16  
 157:2 298:11  
**partnership** 45:1  
 161:22 376:10  
**partnerships** 111:14  
**parts** 86:13 108:17  
 261:9 292:1  
**pass** 59:11 168:3  
 203:19 215:6,11  
 217:1 313:6 363:9  
 375:14  
**passed** 125:8 139:16  
 179:20 184:6 222:8  
 252:2 286:20 304:21  
 309:21 335:14 367:20  
 369:8 376:16 421:5  
 427:17  
**passes** 161:13 292:10  
**passing** 312:22  
**passionate** 94:14 465:7  
**pasture** 299:3,4 319:5  
 326:14,14 336:2  
 384:7 385:3  
**pasture-based** 402:5  
**pastured** 402:5  
**pastures** 76:11 384:10  
 449:12  
**pasturing** 319:16  
**Patagonia** 2:12 377:18

379:22  
**patchwork** 94:4  
**path** 2:13 94:6,9 245:20  
 379:22 392:9 395:2,4  
**paths** 444:15  
**patience** 94:21  
**pattern** 181:17 354:21  
 383:18  
**Pattillo** 2:5 18:20  
**Paul** 2:4,22 18:16 78:8  
 79:16 95:18 103:19  
 107:14 130:16 162:13  
 205:12 409:6 416:6  
 416:14,16  
**Paul's** 95:11  
**pause** 42:15  
**pausing** 325:12  
**pay** 147:14 171:10  
 356:1 417:8 459:4  
**paying** 192:4 362:20  
 389:20  
**PCC** 403:15  
**PCO** 290:3 292:16  
 293:2 396:13 397:2  
 397:19,21 398:5  
**PCO's** 290:8  
**peas** 413:14  
**peat** 229:18 485:19  
 496:2,11 499:10  
**pedo** 452:22  
**pedogenesis** 452:22  
**pedosphere** 283:21  
 284:6,8,15  
**peer** 4:9 8:2 12:18 14:2  
 14:4 52:5,7,15,17  
 53:4,8 54:16,20 57:15  
 58:22 59:1 221:22  
 307:9  
**peers** 222:1 461:2  
**pelletized** 413:15  
**pellets** 267:11  
**pen** 222:11  
**penalties** 24:5,14 26:18  
 193:13  
**pending** 211:21 395:15  
**Penn** 10:3 311:22  
**Pennsylvania** 2:11 3:11  
 10:4 290:1 301:6  
 330:6,12 392:9,10  
 396:12 498:16  
**pens** 222:12,13  
**people** 14:21 15:6,9  
 16:21 23:9,12 31:6  
 32:16 61:13 74:5  
 85:16 86:7 101:22  
 129:22 130:2,5  
 144:11 190:16 191:3  
 192:3 193:10 201:13

- 227:5 234:22 242:16  
242:19 243:7,10,11  
244:3,3,16,21 256:14  
263:11 285:7 323:7  
331:13,22 332:5  
337:10 338:16 341:10  
343:9,10,20 353:2  
362:19 374:16,17  
375:2,21 379:5,6  
394:1,3 395:1,7,11  
404:14 407:6 408:13  
409:16 410:12,19  
411:11,15,16 414:2  
414:17,17 415:14  
423:4 425:14 455:6  
456:16 457:9 464:14  
465:6 467:4,4 470:7,8  
487:17 493:21 496:10  
**people's** 421:4 467:6  
468:11  
**peoples** 362:6  
**pepper** 213:6  
**peppers** 310:20 403:9  
404:3 405:5,17  
**percent** 24:9 70:21  
74:13 75:16 128:7,7  
185:6,10,12 190:11  
192:14,19,19,22  
193:2,8 194:22 195:1  
195:13 231:21 235:21  
236:1,15 237:18  
238:15,20 246:6  
257:7,9 259:5 261:18  
261:20,21 263:10  
264:10 266:8 282:3  
297:8 311:3 312:20  
316:13,14,17 319:19  
320:2,9,11 380:15  
388:3,9 390:7 393:10  
393:11 434:9,11,21  
435:12 437:11 439:12  
439:14 443:2 473:2  
475:11 484:21 485:15  
487:18 489:21 490:6  
**percentage** 246:1,3  
261:1 362:8 363:9  
425:18,22 437:12  
481:5 489:10 494:19  
494:19,20  
**percentages** 261:5  
262:10  
**perception** 343:6 351:3  
**percolation** 476:20  
**Perdue** 15:15  
**perennial** 447:4 475:7  
480:18 485:3  
**perennials** 236:4 447:1  
**perfect** 249:2 365:19  
410:2 463:4  
**perfectly** 349:1 468:3  
**perform** 56:9 149:12  
**performance** 165:10,18  
223:2  
**peri-** 390:17  
**period** 16:18 87:15  
89:18 117:2,20  
179:13 188:17 189:5  
220:7 246:8 284:18  
297:2 303:14 362:18  
440:18  
**perlite** 496:11  
**permanent** 17:13 87:17  
**permit** 146:19 150:18  
152:8 154:13 389:7  
434:22  
**permits** 154:5  
**permitted** 376:2 421:7  
**permitting** 146:18  
**perpetrated** 186:20  
**persevered** 418:16  
**person** 6:17 11:20 90:5  
98:10 175:20 184:3  
293:10 307:9 337:21  
348:12 351:19 372:6  
385:21 389:19 469:8  
**person's** 350:21,22  
**personal** 51:13 98:15  
135:3 226:14 232:12  
375:18 378:12 465:22  
**personally** 191:18  
242:12 377:21 380:5  
**personnel** 90:14,16  
115:22 119:2 120:7  
135:2 138:5 180:13  
196:5 200:11  
**perspective** 105:12  
108:3,4 109:5 118:16  
130:21 155:16 156:5  
269:13 335:11 340:5  
370:11 409:19  
**perspectives** 22:5  
104:20 173:13 496:8  
**pertaining** 225:22  
**pesky** 369:11  
**pest** 47:15 48:1 147:16  
147:21 148:2 149:8  
149:12,16 152:11,13  
195:20 250:13 442:5  
493:3,22  
**pest-free** 150:8  
**pesticide** 397:18  
**pesticides** 134:11  
185:18 186:3 246:21  
303:4 318:5 402:13  
**pests** 49:9 146:13,16  
148:1,11 151:12  
152:22 153:11 233:4  
423:2  
**Pete** 241:15  
**Pete's** 3:2 241:16  
**Peter** 3:2 235:7 241:12  
241:13 251:3  
**petition** 8:9 149:1  
207:17,22 208:17,19  
209:6,9,10,13,14,19  
209:21 210:16,19,20  
210:21 211:8,17,19  
211:21 213:8 223:10  
368:22 375:1 397:17  
**petitioned** 80:2 206:22  
207:8,15 208:16  
211:2,18 212:22  
214:15  
**petitioner** 211:3 213:5  
**petitioners** 210:17  
**petitioning** 208:20  
**petitions** 4:16 21:6  
80:10 206:14 210:3  
211:10,13 212:1,6,17  
213:7 219:14 396:17  
**petroleum** 234:20  
**PGA** 110:16 136:4,5  
141:17 178:20 179:10  
181:4 182:14,15  
183:2  
**PGAs** 110:16 111:19  
113:11 132:16  
**pH** 498:13,16,20 499:6  
499:11,18  
**Ph.D** 2:3,4,6  
**Pharma** 355:1  
**phase** 194:18  
**phased** 192:15  
**phases** 20:20  
**phasing** 132:11 193:6  
**Philadelphia** 122:21  
**philosophical** 285:3  
**philosophy** 359:4  
**Phoenix** 122:20  
**phone** 120:10 161:7  
180:21 269:5,6  
**phones** 100:12 224:12  
**phosphate** 434:4,17  
437:2 438:9,18  
**phosphate's** 438:5  
**phosphorous** 261:19  
**phosphorus** 260:18  
262:16 434:14  
**photography** 101:2  
**photosynthesis** 393:16  
**physical** 200:6 284:2  
**physically** 119:18 200:8  
**physics** 454:20  
**phytosanitary** 108:3  
111:2 150:9 151:7  
152:9 154:11 180:19  
202:5,10  
**pickative** 346:18  
**picking** 180:21 418:14  
**picture** 18:10 80:4  
119:5 131:15 153:4  
283:1  
**pictures** 18:4 77:14  
223:5  
**piece** 193:20 246:13  
270:7 292:17 326:20  
364:11  
**piggyback** 272:10  
**pilgrimage** 330:12  
**pillars** 32:11  
**pilot** 128:8 130:11  
141:7,13,20 193:7  
194:19  
**piloting** 128:3  
**pine** 501:3  
**pioneer** 401:15  
**pioneered** 375:10  
**pioneering** 334:22  
**pipeline** 71:6 189:2  
**pitfalls** 319:11  
**pivotal** 194:2  
**place** 48:1 51:9 58:8  
137:17,19,20 138:4  
139:12,22 171:16  
172:2 184:21 185:20  
190:16 194:20 201:2  
201:19 300:2 306:13  
314:4 373:3 380:19  
411:19,20 437:14  
**placed** 100:15 265:22  
267:22  
**places** 36:14 120:16  
247:12 302:14 404:17  
491:15 497:18  
**placing** 265:14,17  
266:8  
**plain** 119:9 332:12  
341:18 365:9  
**plan** 46:10 54:17 55:5  
64:14 101:11 149:15  
150:19 151:4 236:13  
376:22 428:1,5 447:7  
447:15,15,19 448:14  
**planet** 284:18 285:8  
347:12 375:18 379:10  
**planning** 32:6 148:20  
173:20  
**plans** 30:7 50:16 69:14  
393:8 457:13  
**plant** 28:5 106:7,8  
113:13 143:22 144:3  
145:4,10,20,21 146:2

- 146:6,12 147:7 149:3  
149:10 153:18 155:10  
179:17 229:20 230:6  
235:22 236:2,18,21  
236:22 237:9,10,14  
238:18 254:9 258:19  
258:21 259:22 266:12  
266:13 301:10 311:21  
386:16,17 387:22  
395:22 412:15 423:13  
454:16 464:1 475:18  
476:1 478:21 499:19  
500:9 501:6  
**plant's** 236:15 257:7,9  
478:21  
**planted** 236:3 257:11  
258:17 261:11 412:10  
447:9,22 465:12  
**planting** 263:12 448:6  
476:7 479:13,14  
483:1 497:2  
**plantings** 447:10,20  
448:7  
**plants** 236:7 238:21  
257:14 263:14,17  
287:20 289:7 299:7  
300:16 301:16 302:7  
303:1 318:11 327:19  
330:20 375:13 377:4  
383:12 423:17,22  
446:1,4 452:16 453:1  
455:11 465:12,17,21  
466:3,21 467:6 472:5  
479:4 485:3 498:10  
498:11 499:5,5  
**plaque** 222:19,20  
**plastic** 423:19  
**play** 113:19 165:5  
168:21 169:21  
**played** 138:19  
**player** 113:20 161:13  
**players** 105:1 161:3  
331:14 332:1  
**playing** 73:14 128:18  
249:10 305:12 357:3  
462:7 496:18  
**plays** 277:4  
**please** 14:18 100:12  
224:14 225:7 226:19  
275:3 286:16 313:9  
329:20 330:1 357:12  
403:13 407:11 446:11  
452:6 458:7  
**pleased** 13:4,9 18:2  
73:14 144:4  
**pleasure** 390:2  
**plow** 417:19  
**PLU** 253:4
- plug** 181:22  
**plural** 182:19  
**plus** 231:18 267:3  
347:9 402:2 403:19  
**podium** 255:22  
**point** 76:22 110:11,14  
117:11 143:6 148:3  
153:13 155:5 162:21  
174:2 176:7 180:3  
188:5 193:20 197:10  
201:22 202:5 216:5  
218:13 219:17 226:21  
232:11 258:3 263:7  
263:19 276:16 289:12  
294:3 301:1 303:22  
304:21 306:18 309:13  
325:14 342:14 344:1  
345:13 352:21 370:8  
404:2,18 432:1,3  
454:21 455:10 456:1  
460:10 464:22 465:11  
**pointed** 344:6,9  
**pointing** 108:8  
**points** 97:10 108:6  
191:11 259:6 382:16  
**poised** 83:6  
**poisoned** 258:8  
**policies** 56:7 224:9  
277:12 287:17,21  
289:10 368:17 373:4  
427:15  
**policy** 97:5,6 106:10  
147:2 224:17 251:10  
254:3 268:18 275:2  
289:1 334:10,15  
335:19 336:10 389:16  
427:16 433:11  
**political** 137:6 169:3,6  
275:5 281:22  
**pollute** 259:2  
**polluted** 285:8  
**pollution** 477:1  
**polyoxin** 210:6,13  
**ponder** 468:10  
**pondered** 464:3  
**pondering** 473:4  
**ponic** 306:11  
**pool** 53:13  
**poop** 467:9  
**poops** 472:2  
**populating** 158:7  
**population** 297:14  
342:21 343:18 344:2  
344:16 460:13  
**porch** 355:18,20  
**porosity** 486:2,18  
**port** 47:10 147:1 153:6  
180:6 195:17 199:5,8  
199:13,15,15 200:5  
200:16 201:6 202:16  
**portal** 115:19 116:1  
176:18 204:18  
**ports** 41:11,13 44:17,18  
46:13 130:10 138:11  
147:8,13 150:17  
189:14 196:5 199:12  
200:17  
**posed** 99:12  
**position** 70:8,10 87:22  
88:2 89:4,17 187:19  
252:1 288:6 305:7  
366:14 377:22 397:2  
397:19 400:2,7  
431:21 454:10  
**positioning** 162:6  
**positions** 17:18,21 88:5  
88:9,15 253:12  
427:16 467:20  
**positive** 465:4  
**possibilities** 162:12  
**possibility** 397:8  
**possible** 34:9 86:20  
101:1 136:14 162:10  
181:7 192:9 199:6  
225:11 257:2 321:17  
324:3,4 341:7 406:3  
452:11  
**possibly** 80:9 184:14  
205:18 328:5 431:5  
**post** 59:4 74:10 77:1  
219:7  
**post-2016** 134:2  
**post-core** 133:11,19  
170:18,22 171:1  
**post-reproduction**  
358:16  
**posted** 25:3,16,20 29:3  
29:5,7 98:20 156:1  
209:20 212:3 214:6  
218:9 220:7  
**posting** 25:7 29:6 61:1  
**postings** 25:2  
**postulated** 283:18  
**pot** 479:21  
**potash** 424:6,7  
**potassium** 213:12  
368:9,14  
**potatoes** 364:1,7  
**potential** 98:13,22  
178:14 184:2 349:15  
352:2 357:9 454:15  
**potentially** 31:1 110:16  
111:12 123:21 129:3  
165:3  
**potter** 236:6  
**potting** 381:6
- poultry** 233:8,21 234:7  
435:22 439:20 440:5  
440:14  
**pound** 232:13,13  
**poverty** 343:13  
**powders** 234:1  
**power** 175:15 473:7  
**powerful** 382:22  
**PPQ** 153:15 179:17  
**practical** 254:5  
**practice** 140:4 141:21  
204:16 275:12 278:22  
292:2 448:10,12  
475:15  
**practiced** 201:19  
**practices** 29:20 30:15  
59:7 76:10 163:12,16  
202:2 207:14 254:14  
255:9 271:6 291:14  
324:2 373:19 375:9  
376:6 428:6 448:18  
448:19 475:16 477:12  
477:18  
**Prairie** 2:21 363:18  
**pre-clearance** 151:4  
**pre-existing** 139:18  
**pre-petition** 148:20  
**pre-populate** 158:15  
**preamble** 391:7  
**precedents** 460:10  
**precepts** 323:16  
**precious** 298:19  
**precise** 57:5  
**precision** 52:20  
**predicting** 248:22  
**predominantly** 454:22  
**preface** 74:9 424:20  
**prefer** 245:1 304:19  
312:16 328:16 395:16  
415:2,6 420:4 490:3  
**preferably** 406:4  
**preference** 359:18  
381:19,19 407:14  
425:1,2,5  
**prejudiced** 259:7  
**premier** 300:3  
**premise** 285:17  
**premium** 3:7 327:12  
362:20,20 403:11  
**prep** 286:13  
**preparation** 246:15  
369:15  
**preparations** 286:17,22  
**prepare** 46:18  
**prepared** 451:9 453:6  
**preparing** 166:10  
**preps** 286:14  
**prerequisite** 327:22

- presaging** 306:15  
**prescribes** 97:13  
**prescriptive** 442:12  
 443:17 477:18  
**presence** 44:21 237:6  
 276:2  
**present** 1:11 2:1,8 3:1  
 191:9 230:1 233:6  
 296:14 329:19 482:21  
 494:17  
**presentation** 9:2 31:9  
 73:19 85:1 108:6  
 131:8,9 155:8 159:19  
 203:13 206:17 225:14  
 291:9  
**presentations** 107:11  
 445:4  
**presented** 85:16 191:16  
 193:2  
**presenter** 225:13  
**presenting** 84:3 124:8  
 364:18  
**Presently** 229:15  
**preserve** 299:9  
**preserving** 257:2  
 444:10  
**president** 11:11 227:16  
 231:12 378:1 389:10  
**presidential** 106:5  
**presiding** 1:10  
**pressure** 274:16 351:5  
 417:14  
**presumably** 387:2  
 399:16  
**presumed** 121:6 471:9  
**pretending** 237:5  
**pretext** 421:16  
**pretty** 63:14 77:13  
 113:6 126:12 141:15  
 142:19 148:15 180:1  
 248:21 317:22 325:5  
 383:11 405:16 438:11  
 456:18 482:4 485:8  
 489:15,22 493:3  
**prevent** 49:10 138:1  
 151:11  
**Prevention** 134:19  
**preview** 217:10 218:10  
**previous** 5:17 40:11  
 106:11 133:7 209:7  
 213:21 220:9 226:21  
 246:14,18 277:2  
 324:7 418:10 484:10  
 492:20  
**previously** 106:4  
 214:19 230:18 268:10  
 299:22 339:7  
**price** 66:17 191:1  
 327:12 380:15 403:11  
 404:7 426:8  
**prices** 246:16 265:12  
 405:7,7,8  
**pride** 442:2  
**primarily** 113:22 313:21  
 346:16 377:1 420:17  
 423:5  
**primary** 331:1 364:1  
 377:5  
**principle** 275:17 279:14  
 301:9 331:22 332:6  
**principles** 270:22 276:9  
 315:1,9 428:21  
 441:21 444:1 478:3  
**prior** 99:3 118:1 136:14  
 141:17 170:16 211:11  
 398:13 438:1 440:14  
**priorities** 21:22 254:7,8  
 254:15 421:6 429:12  
**prioritization** 139:22  
 167:6 169:2 171:8  
**prioritize** 112:15 133:14  
 139:19 167:4,8,20  
 218:6 239:11  
**prioritized** 168:11  
 169:8  
**prioritizing** 84:5  
**priority** 28:18 169:12  
 170:19 171:12,19  
 218:8 247:14  
**pristine** 298:19  
**private** 466:8  
**Prize** 287:1  
**pro-hydro** 350:20  
**probably** 113:5 120:14  
 126:8 128:6 142:15  
 167:12 184:12 187:7  
 195:4 201:16,17  
 240:18 247:13,14  
 294:10 309:1 310:3  
 331:9 339:17 354:1  
 359:21 365:2 389:17  
 389:18,19 425:13  
 426:20 445:2 451:18  
 469:18 481:9 483:1  
 498:4  
**problem** 125:21 163:18  
 189:12,13 260:14,21  
 261:7,8 262:3 285:12  
 293:16 318:6 343:6  
 344:5 365:17 366:8  
 387:17 405:6 406:13  
**problematic** 238:11  
 442:20  
**problems** 142:22  
 164:13 170:9 234:21  
 260:13 264:20,22  
 281:1 303:1 318:3,9  
 365:11,16 443:8  
 475:20 486:3 489:15  
**procedure** 51:5 54:5,8  
 58:9,10 373:13  
**procedures** 49:15 50:3  
 50:21 52:21 53:1,6,11  
 53:18,22 54:2,15,16  
 55:21 56:2,7 58:20  
 62:16 78:11,18 88:6  
 97:6 104:16 151:9  
 224:10  
**proceed** 25:18 83:16  
 125:15,16 206:11  
**proceeding** 496:13  
**processed** 231:17,19  
 355:12  
**processes** 39:9 43:17  
 55:19 57:22 59:8  
 230:8 245:20 442:6  
**processing** 58:3 208:8  
 208:10 232:6,7  
**processor** 128:2  
 161:15 174:4  
**Processor/Handler**  
 9:20  
**processors** 27:5 38:9  
 274:4  
**proclaimed** 276:7  
**produce** 46:13 148:22  
 241:17 242:15 245:14  
 256:13,15,21 257:2  
 259:9 280:13,14  
 291:17,18 317:18,22  
 340:9 343:7 387:4,8  
 395:6,10 402:20  
 404:4,7 407:8,18  
 422:3 444:9 451:9  
 459:9 460:20 462:3,7  
 465:3,17 473:10  
 477:11 491:14 492:5  
 492:10 498:4  
**produced** 231:14 252:6  
 261:22 275:18 278:15  
 281:6 356:21 383:1  
 491:14  
**producer** 232:18 279:6  
 354:18  
**producers** 10:8,13  
 31:20 38:14,17 117:5  
 117:10 119:4 128:19  
 158:3 229:6 279:2,12  
 279:13 310:5 320:17  
 348:19 359:17,18  
 387:21 397:11,22  
 398:22 399:12,16  
 400:20,22 401:2  
 440:1 442:14 443:12  
**producing** 148:8  
 249:12 343:8 356:17  
 443:14 458:13  
**product** 35:8 36:8  
 38:15 43:1,4 45:20  
 49:11 60:21 94:14  
 113:7 117:1,11  
 118:10,13 119:20  
 120:13 123:17 127:21  
 128:19 129:3,5,11  
 133:17 160:20 161:10  
 172:8,11 179:1,9  
 185:19 187:14,18,20  
 200:8 201:1 202:4  
 204:3,8,14,15 227:18  
 232:11,17 233:2,8  
 234:20,21 272:8  
 288:9 291:11 292:7,8  
 294:19 346:8 362:21  
 372:7 373:11 439:14  
 439:15  
**productive** 418:20  
**productivity** 490:16  
**products** 3:12 24:7  
 26:8 27:5,7 29:19  
 30:3 37:21 41:5,13  
 43:6,8,18,19 45:3,15  
 46:16 48:5,16 49:1,5  
 49:8,16,17 50:4 71:1  
 79:19 104:4,18,21  
 108:2 111:3 114:20  
 116:9 117:7 124:4  
 161:4 166:16 187:8  
 188:12 192:17,22  
 201:22 204:20 212:10  
 227:16 228:10,14  
 229:3 232:19 243:18  
 251:13 259:9 270:9  
 276:12 278:14 281:6  
 291:15 356:17 372:10  
 400:3,15 425:16  
 427:22 429:20 436:3  
 438:12,16,17 493:22  
 495:4  
**professional** 475:15  
**professionally** 228:1  
**profit** 331:15 332:7,12  
**program** 2:2,3,4,5,6,18  
 4:6,15 5:10,19 11:6  
 13:6 17:10,17 28:19  
 40:12 51:11,14,19  
 52:6 53:9 61:22 62:9  
 62:15 63:1 80:22  
 82:17,18 83:21 93:11  
 99:3 104:1,5 106:9  
 107:3,20 109:7,8,11  
 111:11 114:18 115:22  
 126:4 128:8 180:12

- 180:20 186:17 193:7  
193:8 194:19 203:17  
203:20 204:2,13,17  
206:12 207:18 215:20  
217:5 221:17 222:5  
222:14 241:5,8  
243:21 246:11 270:8  
271:5 292:12,16,20  
293:14 299:17 313:3  
316:13 321:5 325:9  
354:20 365:13 376:17  
396:12 423:12 431:7  
431:15,20 441:11  
443:14 468:16  
**Program's** 223:4  
**program-wide** 40:15  
55:4  
**programming** 69:22  
137:2  
**programs** 15:18 16:4  
16:15 40:7 62:21  
93:12 105:16,18  
115:5 145:2 146:15  
155:15 157:3 159:7  
203:14,16 204:4  
205:3 270:5 493:1  
**progress** 93:16 94:1  
95:14,22 139:4  
206:19 369:18 443:10  
477:13  
**progressive** 289:5  
**prohibit** 324:21 429:19  
435:13 439:19  
**prohibited** 48:6,18  
93:21 179:2 200:10  
370:2,18 371:2,6,10  
371:16 373:14 429:21  
438:10 442:17  
**prohibiting** 435:21  
**prohibition** 388:8  
434:16  
**prohibitive** 297:8  
**prohibits** 172:8 440:11  
**project** 109:20 131:16  
132:5 136:19 138:21  
188:21 223:16,21  
256:12  
**projects** 39:17 126:20  
140:2 268:12 456:17  
456:18  
**proliferating** 321:13  
**prominent** 93:11  
154:18  
**promise** 375:22  
**promote** 145:18 236:13  
277:7 336:18,20  
**promotes** 429:2  
**promoting** 145:13  
308:12 419:7  
**promotion** 115:4,8,22  
204:1,12 205:2  
**promptly** 206:4,5  
329:10,13  
**promulgated** 146:1  
**proof** 120:8  
**propagative** 153:17  
**proper** 314:15 365:20  
377:2 406:2 457:6  
**properly** 242:21 336:14  
457:3  
**proponents** 342:19  
**proposal** 46:6 164:11  
203:17 211:11 235:17  
238:6 251:21 252:2,8  
253:20 256:3 274:7  
290:6,18,19 291:4  
292:16 304:16 305:4  
312:14 313:1 318:19  
324:15 348:7 368:8  
368:13 381:13 390:6  
396:18 398:3,9  
430:20 435:2,10  
436:6 441:14,19  
442:11,16,19 443:8  
443:18 444:16 461:18  
474:17 475:6 476:3  
476:22 477:20 487:7  
**proposals** 98:20 162:19  
207:1 208:15 211:8  
467:21  
**propose** 299:18  
**proposed** 19:22 20:3  
21:3,9,11 27:13 41:20  
82:1,5 159:5 252:10  
254:1 292:21 296:4  
298:3 319:7 322:9  
392:17 398:17 429:8  
**proposes** 283:18  
**proprietary** 262:8 372:1  
372:4,10,18 374:2,7  
467:17  
**propriety** 260:3  
**protect** 26:20 30:13  
49:19 51:21 59:15  
104:11 145:18 254:4  
285:9 304:1,10 357:6  
379:4  
**protected** 300:1 373:8  
393:19  
**protecting** 21:21  
145:12 163:4 296:2  
298:18 349:10 433:21  
435:18 481:22  
**protection** 2:14,19 28:6  
32:1 43:9,10 105:20  
106:8,13 110:5 121:5  
129:17 134:10 140:9  
145:21,22 146:7,12  
147:6,7 149:3 150:16  
155:12 179:17 296:7  
**protective** 176:20  
**protein** 311:20 312:7  
356:3 480:11,13,14  
495:12  
**protozoas** 472:7  
**proud** 309:7 450:16  
490:17  
**proudly** 222:21  
**prove** 118:3 199:1  
464:11  
**proved** 443:4  
**proverb** 453:7  
**provide** 34:21 36:9  
53:14 82:19 85:19  
89:18 97:19 104:15  
105:2 115:7 131:14  
132:3 143:17 149:8  
162:19 163:2 166:15  
181:6 191:8 196:1  
205:22 209:16 292:12  
304:12 395:10 450:4  
455:8  
**provided** 15:6 34:20  
104:1 120:8 133:21  
180:11,13 183:19  
203:4 225:15 297:1  
368:17  
**provides** 23:11 29:20  
30:14 99:4 110:10  
140:22 210:21 254:2  
375:7  
**providing** 23:6 68:17  
105:11 155:18 156:5  
200:10 442:1 490:19  
**provision** 116:20  
**provisions** 127:19  
291:3 376:22 428:2,9  
**proxies** 226:13  
**pruning** 485:3,4,10  
**Prussack** 3:9 401:6  
409:9,10 412:3,8  
413:7,11,18 414:10  
415:4,9 416:2,5  
**public** 4:18 8:10,12 9:8  
11:9 12:8 15:3 19:8  
20:1,3,7,17 34:5  
53:12 57:20 69:19  
81:4,12 82:6 85:4,6,7  
85:19 86:13,14 93:12  
96:2,6 97:16 98:20  
100:11,16,20 101:2,4  
101:6 106:2 132:14  
155:22 156:3 166:2  
200:4 209:8,11,22  
219:7 224:7,8,15,17  
224:21 225:9 227:4,8  
246:19 260:11 263:9  
279:18 327:10 329:20  
330:1 350:19 356:7  
372:2 376:18 435:19  
466:8 489:3  
**public's** 94:21  
**public-private** 161:21  
**publically** 42:10 70:2  
**publish** 69:21 373:3  
**published** 19:14 21:4  
29:14 40:3 82:6  
207:18 295:22 355:15  
356:5 373:13 446:13  
**publishing** 37:22  
**pull** 25:22 115:10 116:1  
130:18 162:7 224:11  
321:8  
**pulled** 94:11  
**pulling** 204:18  
**pumpkins** 242:1  
**purchase** 220:10  
356:20 375:17 434:11  
**purchased** 39:12  
393:10  
**purchases** 462:10  
**Purchasing** 378:2  
**purely** 171:1  
**purity** 252:3  
**purple** 146:22  
**purpose** 206:16  
**purposes** 114:4,4,21  
115:11 116:4 117:13  
**pursue** 353:7 446:9  
**pursuing** 137:8 138:16  
**push** 169:15 467:9  
**pushed** 158:19 323:10  
**pushing** 126:9  
**put** 60:15 64:19 66:4  
67:15 75:2 77:9 79:17  
79:22 88:12 89:15  
109:16 119:9 127:22  
135:7 150:10 151:5  
151:17 153:3 167:21  
175:2,20 190:16  
194:19 199:19 235:20  
251:17 255:17 274:16  
277:11 319:17 320:11  
334:13 337:20 345:15  
355:11 380:5 403:1  
403:17 411:9 440:11  
440:13 470:18 472:11  
472:11 478:19 479:4  
480:5,6 481:13  
487:10 488:6 492:4  
494:17,18,21 495:3  
500:20

**puts** 299:15 344:11  
354:6  
**putting** 79:13 260:6  
273:12 324:15 402:20  
414:6 491:20

---

**Q**

---

**QCS** 103:2  
**QR** 38:5  
**quagmire** 288:3  
**qualifications** 88:18,20  
88:22 91:2  
**qualified** 70:13 377:8  
**quality** 20:12 35:19  
36:17,19,21 39:4,5  
53:7 55:18 59:1  
114:18 115:6 117:4  
117:18 129:1,6  
157:14,14 242:3,17  
242:17 264:21,21  
314:19 317:17,21  
459:1,4 461:1 476:17  
**quandary** 391:3  
**quantify** 360:2  
**quantity** 20:12 35:19  
39:4 157:15  
**quarantine** 2:20 106:9  
106:10 146:7 147:7  
151:8,18 153:17,22  
179:18  
**quarrel** 332:9  
**quarter** 221:19,19,21  
222:5,7,8,15,17,22  
**quarterly** 221:21  
**quarters** 235:1  
**quest** 465:9  
**questioned** 418:15  
**questionnaire** 359:19  
**questions** 13:1 14:6  
23:6,7,13 25:12 36:15  
59:17 60:2,3,5 63:7  
67:17 70:5 72:6,9  
78:7,12 89:21 107:6  
125:22 130:14 148:13  
148:16,19,22 155:2  
166:19,20 185:21  
192:1,7 196:3,22  
201:14 220:14 223:11  
224:16 225:13 226:3  
231:5 233:14,15  
237:22 238:1 254:20  
259:16 266:18 269:8  
280:6 312:4 315:21  
316:9 324:11,13  
327:9 337:13 347:2  
350:14,15 357:20  
377:11 385:12 392:4  
416:12 419:12 422:8

430:9 433:1 436:21  
438:13 444:20 446:20  
451:12 455:19 460:2  
461:15 466:13 478:8  
501:13  
**quick** 67:13,15,22  
86:16 119:5 142:11  
157:9 175:5 181:8  
182:6 183:10 201:14  
217:10 220:16 224:11  
233:19 240:4 250:3  
263:5,6 280:6 281:14  
294:7 350:12 490:21  
**quicker** 424:5 486:13  
**quickly** 16:9 25:22  
66:15,21 71:3 72:19  
72:20 73:13 143:1  
147:16 148:16 149:21  
151:17 156:9 180:1  
182:3 225:11 245:17  
339:10 449:21 496:16  
499:7

**quiet** 103:16 224:15  
329:21  
**quietly** 356:16  
**quite** 63:10 113:19  
132:8 157:4 188:10  
238:13 246:17 264:21  
275:2 279:9,9 307:16  
325:6 415:4 483:16  
**quorum** 329:18  
**quote** 239:7 332:17,19  
355:18 356:10,18

---

**R**

---

**R** 3:10 268:9  
**R&P** 204:17  
**rabbit** 195:10  
**radical** 178:3  
**rains** 257:21  
**raise** 383:22 444:22  
**raised** 167:2 185:22  
275:10 282:13 304:9  
393:19 432:2 456:1,4  
**raises** 327:9 438:13  
**raising** 393:12  
**Rakola** 73:10  
**Raleigh** 149:11  
**rallies** 322:12 323:2,7  
324:7  
**rally** 102:16 322:16  
323:8  
**ran** 316:22  
**ranchers** 92:12  
**Rangan** 3:10 264:2  
268:8,9 271:17  
**range** 96:8 191:4  
242:16 343:15 381:4

402:4,4 454:6 483:8  
487:15 498:16,20  
499:2,6  
**ranged** 421:4  
**ranges** 153:1 445:7  
446:13  
**rapid** 26:9  
**rapidly** 27:9 227:7  
374:18  
**rare** 297:11 298:18  
397:14  
**raspberries** 321:12  
412:20 497:5  
**rate** 495:14  
**rates** 476:14  
**ratings** 268:13  
**ratio** 191:20  
**rationalizations** 392:22  
**raw** 176:18 232:16  
414:2,3 464:20  
**re-** 47:22 48:9  
**re-approved** 310:13  
**re-export** 152:19  
202:19  
**re-exported** 127:18  
**re-exporting** 127:20  
**re-list** 20:6  
**re-looking** 71:11  
**re-negotiate** 281:3  
**re-negotiating** 281:13  
**re-petition** 209:15  
**re-petitions** 209:18  
210:15  
**reach** 135:17 139:13  
155:3 266:6  
**reached** 465:14  
**reaches** 344:10  
**reaching** 39:1  
**read** 14:12 21:14  
181:16 224:18 226:22  
273:15 294:8 358:20  
390:22 391:1 430:20  
453:6  
**readily** 261:13 469:13  
472:4,6  
**readiness** 142:21  
**reading** 227:4 418:12  
445:5 459:17  
**reads** 428:22  
**ready** 103:6 168:19  
218:4 369:22 463:1  
466:15  
**reaffirmed** 51:20  
**real** 16:17 71:18 75:5  
76:7 77:5 121:1  
160:15 173:3 175:5  
176:11 183:10 312:21  
321:16 336:13,20,21

337:3 366:8 456:7  
**real-time** 111:7 123:3  
123:11  
**realist** 381:22  
**realistic** 288:13 334:14  
334:20 335:1,13  
**reality** 197:19 331:10  
476:22 478:2  
**realize** 60:20  
**realized** 91:21 102:3  
418:2 449:21  
**realizing** 459:2  
**reams** 119:13  
**reason** 193:9 222:11  
275:1 276:2 320:4  
364:3 435:15 475:17  
**reasonable** 456:15  
**reasoning** 475:11  
**reasons** 36:1 94:5  
128:4 170:17 274:9  
348:20 349:2,3  
362:18 390:9 464:18  
499:10  
**reassurances** 93:8  
**recalcitrant** 487:15  
**recall** 431:14 432:7  
**receive** 30:22 53:14  
96:9 125:4 153:9,10  
185:11 201:22 209:9  
377:5  
**received** 80:14 211:19  
359:22 397:21 407:7  
**receives** 98:5  
**receiving** 27:7 161:14  
**reception** 103:3  
**recess** 103:9 206:3,6  
501:18  
**recipient** 221:18 222:8  
**reciprocal** 33:4  
**reciprocity** 393:1  
**reclassification** 213:12  
**reclassify** 213:15  
**recognition** 8:18 50:11  
50:22 51:3 57:16  
**recognize** 6:2,15 18:15  
72:8 180:4 221:15  
253:13 340:6  
**recognizes** 222:21  
**recognizing** 7:3 73:12  
**recommend** 276:14  
296:21 329:11 347:1  
455:10 462:1  
**recommendation** 42:12  
45:22 46:17 47:4  
49:20,22 50:20 51:4  
52:13 85:10 199:22  
200:2 216:12 217:18  
237:17 253:19 292:11

- 313:15 318:17 319:1  
319:4,5,9,10,17  
320:19 321:10 345:16  
369:9,16,19 383:11  
388:7,12 427:19  
428:11 429:20 435:21  
475:3 477:15
- recommendations** 21:7  
21:10 41:20,21,22  
42:14 44:11,13 47:3  
48:12 51:8 56:11  
64:11 104:15 156:19  
159:4 160:7 166:15  
205:21 235:18 239:10  
253:12 346:1 429:7  
441:15,17
- recommended** 19:18  
42:9 44:22 45:16  
46:10,14 48:13 49:6  
49:14 50:9,20 54:12  
199:5 215:19 290:17  
438:2
- recommending** 388:7  
454:10 476:14
- recommends** 29:20  
50:13 85:2,12
- recompete** 223:15
- reconcile** 120:18 121:2  
121:14 126:2 168:7
- reconciliation** 185:13
- reconciling** 123:8
- record** 23:19 30:8 53:22  
55:17 103:12 161:12  
206:8 225:21 226:8  
235:9 241:14 255:20  
261:15 264:4 273:21  
329:15 330:4 339:13  
354:14 374:12 377:15  
389:4 395:3 409:8  
427:8 432:6 441:9  
474:11 501:21
- records** 38:2 56:16,19  
57:8 59:6 75:4 76:6,9  
198:22
- recover** 300:14
- recovered** 296:10 300:1  
300:13
- recovery** 300:15
- recruited** 95:16
- recruiting** 17:13
- recusals** 99:8,17,19,22
- recycled** 209:5
- red** 225:3,5,7
- redefine** 383:14
- redefining** 336:12
- redistribute** 217:18
- reduce** 38:8 158:13  
444:7
- reduced** 111:8 127:13  
417:13
- reduces** 38:3 344:13
- reducing** 383:20
- reduction** 402:12
- redundant** 110:3  
230:11 237:19
- reestablish** 406:7
- refer** 109:18 110:16  
398:15
- reference** 12:9 58:17  
99:8 288:1 439:8
- referenced** 54:19
- referencing** 369:11
- referred** 167:17 168:1  
168:20
- referring** 167:12 413:9  
492:14
- refine** 34:16 59:7  
228:10,13
- refinement** 155:18
- refining** 58:2
- reflect** 73:16 188:20
- reflected** 421:5
- reflection** 96:17
- reflects** 217:6
- refrain** 100:16 226:14  
226:18
- reg** 175:13,15,16  
179:14 181:7
- regard** 295:16 369:2  
398:21
- regarding** 70:22 148:19  
170:6 196:16 214:10  
228:17 251:21 252:8  
254:7 291:14 329:14  
368:7 369:7 485:17
- regardless** 230:14  
236:9 336:19
- regards** 234:12 443:9
- regenerate** 285:16  
300:18
- regenerating** 271:1
- regeneration** 299:7  
352:10 379:9 402:10
- regenerative** 269:20,22  
270:4,12 271:9,15  
324:9 375:9 406:3
- regimen** 417:4
- region** 27:19 261:17,22  
262:1 265:4 463:12
- regional** 28:2 92:22  
476:17 477:21
- regions** 27:22 31:5  
404:13
- Registry** 154:16,18
- regs** 129:14 174:21
- regular** 34:21 59:9  
140:15 369:14
- regularly** 242:8
- regulate** 115:6 122:14  
129:9 204:7 237:5
- regulated** 122:16 124:4  
187:10 481:22
- regulates** 114:17  
117:17 118:18
- regulating** 109:1  
114:13 145:13
- regulation** 89:4 108:2  
112:10,11 124:10  
194:20 297:2 428:9
- regulations** 23:1 29:22  
32:13 33:5,9,11,12  
41:8 42:8,8 56:2  
58:18 75:21 76:1  
108:16 116:14 127:20  
128:14 129:13 130:6  
138:1 159:22 171:13  
175:10 176:11,12  
187:17 195:17 208:11  
216:7 281:12 291:10  
292:14,22 303:11  
315:7 323:16,18  
346:3 357:14
- regulatory** 15:18 16:4  
16:14 29:18 76:2 93:5  
105:16 128:4 133:16  
139:15,17 144:16  
145:2 146:6 148:14  
150:13 159:18,20  
163:13 171:15 172:2  
172:5 173:7 174:19  
175:7,22 176:19  
177:5 178:18 185:16  
189:22 196:14 197:4  
203:18 376:9
- rehab** 470:15
- reinforced** 302:14
- reissue** 219:12
- reiterate** 141:22 368:6  
398:2
- reiterates** 30:10
- reject** 357:9
- relate** 160:7 303:9  
364:20
- related** 30:5 31:10 42:3  
44:13 47:3 53:20 54:2  
54:15 56:2,15 57:8  
58:20 67:17 70:20  
73:1,4 105:18 145:19  
189:10 207:12 254:8  
275:18 293:14 295:6  
295:20 380:14
- relates** 49:22 117:6
- relating** 474:19
- relation** 266:13,14  
360:14
- relations** 251:10
- relationship** 130:12,13  
141:16 361:15
- relationships** 99:2
- relative** 353:11
- relatively** 37:6 143:4  
353:5
- release** 34:5,7 121:7  
123:13 125:14 129:16  
475:21 478:15 487:16
- released** 118:1 123:17  
123:19 124:2 138:16  
266:6,10 333:5
- relevant** 225:22 227:13  
235:8 254:16 274:6
- reliability** 121:8
- reliance** 461:13
- reliant** 343:3
- relied** 121:9
- relisting** 358:6,11 399:5
- rely** 75:14 132:15,16  
138:13 159:17 269:6  
375:5 376:7,20
- relying** 367:5
- remain** 20:10 92:15  
130:14 397:3
- remaining** 34:11 217:16
- remains** 252:19
- remarks** 221:13 226:15
- remedying** 339:10
- remember** 43:16 46:7  
49:4 182:22 224:14  
283:10,11,17 418:14  
442:22 489:2
- remembered** 417:17
- remind** 99:20 101:2  
109:15 120:2 226:6
- reminded** 77:12 177:14
- reminder** 67:16 224:12  
226:12
- reminding** 162:14  
194:1 270:1
- reminds** 77:15
- remiss** 95:9
- remote** 225:16
- removal** 20:22 85:2,7  
85:17 86:8 215:19  
438:2
- remove** 215:4 216:21  
301:20 359:11 397:1  
400:10 435:10 437:9  
438:1
- removed** 19:15,19  
301:21 397:8 400:16  
434:5
- removing** 230:18 332:7

- renewable** 308:13  
 402:13  
**renewals** 56:3 57:10,14  
**renewed** 19:16  
**renewing** 342:7 344:12  
 345:2 346:17  
**reorganize** 216:12  
**repeat** 141:4  
**repeatedly** 431:6  
**repeating** 40:1  
**repel** 233:2  
**repetition** 109:17  
**replaces** 221:8  
**replacing** 70:9  
**replenishing** 349:10  
**replicated** 362:14  
**report** 4:5,6,7,11 8:1  
 12:5,6,14,17,18 13:22  
 39:22 40:3 45:12  
 50:17 52:2 56:13  
 58:11 59:5 60:8 68:13  
 91:19 159:3 182:6  
 188:12 190:7 208:1  
 213:9 214:5,12 218:3  
 218:14,22 219:9,11  
 219:12,19 220:1,5  
 221:1 223:15 295:22  
 371:13  
**reported** 22:16  
**reporting** 29:8 35:22  
 36:1,4 67:5 68:11  
 114:4 115:1  
**reports** 3:13 8:1 16:15  
 34:16 36:10 51:10  
 207:19 212:2,18  
 217:22 218:7,11  
 219:5,21 220:21  
 268:12 433:12,13  
**represent** 11:9 14:11  
 17:6 24:16 97:21  
 136:9 228:4 268:9  
 274:1 313:12 374:17  
 375:2 400:22 409:10  
**representation** 172:8  
 348:9  
**representative** 97:9  
 111:17  
**representatives** 8:6  
 97:8 163:1 164:15  
 194:14  
**represented** 50:5 98:4  
 113:13 193:1 408:10  
 452:16  
**representing** 24:6,13  
 71:1 98:12 227:15  
 377:18  
**represents** 350:1  
 352:10
- reputation** 414:18  
**request** 80:14 100:5  
 122:8 124:20 125:1,4  
 135:17 137:19 149:5  
 171:10,18 202:18  
 214:7 315:15  
**requested** 218:15  
**requesting** 46:4 202:7  
 211:4  
**requests** 104:14 133:15  
 157:11 171:4 218:8  
 397:22 441:19  
**require** 33:7 55:12 56:3  
 136:11 175:8 185:10  
 186:3,5,9 201:19  
 204:14 243:17,19  
 253:4 291:5 336:6  
 341:5 358:18 373:17  
**required** 42:19 43:6  
 44:5 46:2 58:14 68:5  
 68:7 75:16 100:7  
 117:10 141:13 174:14  
 174:16 195:13 203:7  
 290:21 291:3 356:12  
 372:15 443:2 465:19  
**requirement** 47:19  
 119:21 123:10 152:9  
 154:20 171:13,15  
 175:16 192:22 220:4  
 232:12 235:22 236:2  
 237:18,20 257:7,9  
 263:10 345:11,18  
 487:9 494:16 498:1  
**requirements** 29:18  
 30:2,7,11 41:18 134:7  
 134:9,9,12,16,22  
 136:8 138:3 139:21  
 146:20,21 150:5,5,9  
 150:22 151:1 152:5,7  
 154:22 173:19 183:1  
 196:21 236:8,16  
 251:22 303:21 442:12  
 442:15 443:7,17  
 491:22 498:2  
**requires** 26:19 112:13  
 142:10 231:2 237:6  
 356:10 495:12  
**Requiring** 27:17  
**research** 96:22 98:22  
 115:4,8,22 204:1,12  
 205:2 254:7,15,22  
 255:6 352:2 436:12  
 436:14 465:22 466:1  
 466:7 474:19 488:13  
 489:14  
**researched** 387:13  
**researcher** 469:8  
**researchers** 274:5
- researching** 239:9  
**resembles** 500:14  
**reshuffling** 195:4  
**reside** 114:12 146:7  
 147:10  
**resides** 302:21  
**residue** 33:7 186:10  
**resilient** 94:17  
**resolution** 309:20  
 363:10  
**resolve** 71:4 365:21  
 373:18 431:3 461:8  
 461:11  
**resolved** 168:14 313:5  
 369:11 408:9  
**resounding** 153:19  
**resource** 106:19 138:7  
 217:9 254:17 285:21  
 347:1 351:4  
**resources** 56:9 126:14  
 129:19 139:22 142:3  
 144:18 145:19 154:15  
 156:2 170:2 190:2  
 285:10 340:16 347:2  
 347:3,8 444:8,11  
**respect** 121:16 169:9  
 225:9,10 233:5  
 409:13 410:12,18  
 411:11 433:7  
**respectful** 96:17 101:5  
 361:14  
**respectfully** 369:16  
**respective** 144:6  
 156:15 163:3  
**respiratory** 234:5  
**respond** 121:4 148:5  
 159:3 245:17  
**responded** 51:7  
**responding** 156:19  
**response** 12:11,15 23:7  
 40:5 63:3 74:2 100:8  
 147:21 172:17 214:8  
 219:19 349:6,8  
 359:20 433:2  
**responses** 41:20 42:1  
 42:14 64:7,7 327:10  
**responsibilities** 30:4  
**responsibility** 79:12  
 128:14  
**responsible** 57:12  
 102:5 443:21 476:19  
**rest** 7:9 8:10 194:9  
 216:10 258:22 279:12  
 342:9 407:22 419:9  
**restrict** 437:9  
**restricted** 439:12  
**rests** 32:11  
**result** 20:7 22:19
- 139:15 209:6 263:17  
 454:11 465:4  
**resulted** 26:9  
**results** 38:12 127:7,7  
**resumed** 103:13 206:8  
 329:16  
**retail** 315:16  
**retailer** 395:9  
**retailers** 9:12 97:17  
 403:15 458:14  
**retain** 124:13  
**retained** 126:19  
**rethink** 341:6 347:10  
**retired** 378:1  
**retirement** 95:7  
**retiring** 55:20  
**retract** 355:8  
**retracted** 431:16,18  
**return** 340:19  
**reused** 495:22  
**reveal** 374:2  
**reverse** 349:16 352:3  
 352:19  
**reversed** 355:9  
**review** 4:9 7:18 8:2,17  
 12:18 14:2,4 19:13  
 24:11 37:21 45:11  
 52:5,7,15 53:4,8  
 54:16 56:6,16 58:4,19  
 59:2 70:15 76:9 79:18  
 87:2 90:21 91:4,6  
 97:5 98:21 135:9  
 149:9 157:9 184:11  
 207:20 209:7,13,15  
 209:17 210:4,22  
 211:11,17 212:8,11  
 212:20 213:9,14  
 215:16,16,18 216:13  
 216:14,19 217:17  
 218:5,18 368:5  
 387:15 397:22 400:8  
**reviewed** 89:7 136:13  
 207:9 216:6,11  
 217:13  
**reviewing** 30:5 52:21  
 56:12 76:6 135:6  
 228:15  
**reviews** 23:19 50:17  
 52:17 54:20,21 57:4  
 57:15 58:22 211:13  
 212:11 219:14  
**revise** 51:5 58:16 369:9  
**revised** 54:15 298:2  
**revision** 231:3 276:4,5  
 276:8 279:18 281:22  
**revisions** 292:13,21  
**revocations** 25:10  
 26:18 27:13

**revoke** 62:6  
**revoked** 24:20 26:1  
 62:4,5  
**revolution** 375:11  
**rewarded** 361:16  
**Rhode** 37:17  
**Rica** 322:20  
**Rice** 1:18 11:4,4 200:17  
 293:18  
**Rich** 251:6 255:13  
**rid** 440:15  
**Riddle** 3:10 420:10  
 427:5,9,9 430:4,8,13  
 430:15,17 431:1,13  
 432:3,15,17,20 433:5  
**ride** 316:7  
**ridiculous** 383:8  
**riding** 361:17  
**right-hand** 145:1  
**rights** 362:7  
**rigorous** 230:5 358:21  
**rigs** 267:21  
**risk** 31:5 48:2 62:11  
 149:12 354:7 378:14  
 478:11  
**risk-** 65:12  
**risk-based** 47:12 62:17  
 62:21 72:18 76:18,21  
 78:10 79:6,11,14  
 153:18,22  
**risks** 62:1 63:4  
**Riverdale** 144:12  
**Rivers** 323:19  
**road** 176:22 321:11  
 403:19  
**roadmap** 51:18  
**rob** 481:10,15  
**robust** 53:10 57:8 58:12  
 76:14 87:4 113:14  
 115:1 128:11 145:9  
 179:6 278:1 301:13  
 358:21  
**rock** 245:12 316:18  
**Rodale** 3:7 273:6  
 330:14 331:3,5,20  
 332:15 382:8  
**Roger** 3:8 382:5 389:2  
 389:3,6  
**role** 5:17 6:9 17:12 18:2  
 87:14 116:8 131:2,20  
 131:21,21 138:19,20  
 165:6 168:21 169:22  
 239:12,14,19 277:2  
 344:19  
**roles** 16:22 156:15  
 163:3,15,21,22  
**roll** 331:5 408:8  
**rolled** 309:14

**Rome** 347:5  
**roof** 279:10 426:9  
**room** 102:9 176:5,9  
 215:13 270:11 334:17  
 378:11,12 379:5  
 394:6 408:11 409:16  
 450:9 476:7  
**root** 237:6 452:17 455:3  
 477:1 478:4 480:2  
 486:11,17 495:22  
 496:1 500:8 501:4  
**roots** 302:9 311:21  
 396:1 423:21,22  
 486:3  
**rotate** 250:13 447:17  
 457:5  
**rotating** 336:2 447:5  
 479:15  
**rotation** 241:19 250:5,5  
 250:9 286:2 314:15  
 364:3 377:3 412:6  
 422:16,18,21 446:20  
 447:4 457:13  
**rotations** 303:17 457:6  
**rough** 173:15  
**roughest** 173:16  
**roughly** 188:15  
**round** 6:3,11 14:17  
 365:2  
**routine** 435:16  
**rows** 484:11  
**ruderal** 296:15 300:9  
**Ruihong** 17:11,11,15  
 17:22 18:3 87:13  
 95:21  
**rule** 13:17 19:13,13,16  
 20:3,6 21:9,11,16  
 82:1,3,5 230:9,22  
 236:21 258:19 296:4  
 296:12 319:7,8  
 355:15 356:4 392:17  
 442:22 443:5,9  
 456:10,11  
**rule-** 290:15 293:1  
**rulemaking** 20:5,8,14  
 21:5 85:4,18 86:9,14  
 128:6 149:22 150:2  
 215:21 357:9 438:3  
**rulemakings** 175:22  
**rules** 21:3 23:17 275:4  
 276:9 279:19,21  
 321:4 323:17,18  
 391:15  
**run** 107:10 182:6 192:5  
 232:2 241:20 242:21  
 249:17 286:15 307:1  
 308:6 358:2 393:9  
 401:14 452:3 473:1

499:6  
**run-out** 449:10  
**running** 101:11 204:13  
 268:11,12 270:6  
 307:18 325:13 363:14  
**runoff** 238:14 258:2,7  
 258:10 260:19 476:2  
 476:20  
**runs** 191:5 259:2 320:1  
**rural** 402:11  
**Russell** 3:12 227:10,11  
 227:15

---

**S**


---

**S** 4:1  
**sad** 321:19,19  
**safe** 7:16 232:16,16  
 408:20 433:17 455:12  
 464:11 469:14 470:9  
**safeguarding** 144:15  
 146:9,10  
**safer** 82:17 433:15  
**safest** 362:3  
**safety** 106:3 113:16  
 114:21 134:14 268:11  
 380:17 463:15,18  
 464:15,17 466:11  
 467:12 468:19  
**sale** 172:10,22 173:6  
 178:19 179:5 317:9  
 376:13  
**sales** 92:11 189:4  
 313:19 314:5 353:22  
 378:20 380:10  
**Salinas** 473:11  
**salinity** 264:22 475:18  
**salmonella** 465:2  
**salt** 210:7 268:2  
**salts** 210:14 265:2  
**salty** 486:19  
**sampling** 27:18 153:18  
 153:22  
**sand** 286:12,13  
**sanitary** 154:11  
**sanitizer** 212:10  
**sanitizers** 79:19 80:2  
 81:8  
**sapropel** 229:18  
**sat** 174:4 468:3  
**satellite** 27:21,22 54:10  
 55:9,11,12 63:3  
**satisfactory** 240:14,17  
**satisfied** 23:9  
**satisfy** 319:13  
**Saturday** 144:20  
**Savan** 219:16  
**save** 158:20 313:2  
 489:19

**saved** 491:20  
**saving** 304:2  
**savings** 142:3  
**savvy** 459:22  
**saw** 96:4 260:10 383:18  
 484:12 490:11  
**saying** 71:20 73:3  
 122:17 125:17 197:12  
 279:21 306:19 310:5  
 311:1,3 350:20 373:9  
 387:22 403:1 404:5  
 406:19 411:4 427:21  
 434:12 440:20 445:22  
 447:21 473:13 478:19  
 484:1 500:11  
**says** 58:9 116:20 117:7  
 124:14 125:8,10  
 194:20 222:4,13,20  
 263:4 332:17 364:8  
 374:17 375:4 382:2  
 428:14  
**scale** 174:13 185:4  
 360:20 387:21 395:1  
 451:5,5 454:13,18  
 460:20 462:4  
**scanned** 135:10  
**scarcity** 348:22  
**scene** 74:12 401:19  
**schedule** 74:19 251:7  
**scheduled** 74:21 216:7  
 217:15 434:1  
**schedules** 151:10  
**scheme** 201:19 242:14  
**school** 385:7 388:18  
 484:22  
**school-age** 385:4  
**schools** 477:16  
**science** 17:17 67:3  
 106:17 149:10 249:3  
 268:18 269:5 284:6  
 403:4 409:1 463:15  
 463:19  
**science-based** 67:9  
**scientific** 269:8 478:3  
**scientist** 66:11 283:16  
**scientists** 97:15 331:12  
 465:15  
**scofflaw** 319:14  
**scope** 186:17 218:21  
 296:6 360:13 429:10  
**Scott** 1:18 11:4 200:13  
 200:16 293:17  
**screen** 323:13 374:16  
**screening** 90:19  
**scrutiny** 62:10  
**SDBS** 212:16  
**se** 273:10  
**sea** 119:17

**seabird** 317:1  
**seal** 222:4,15 290:11  
 307:20 308:1,1,15  
 320:22 436:4  
**search** 25:6 38:12  
 88:14 90:8,9 382:21  
**searchable** 25:4  
**searches** 90:6,6  
**season** 77:3 249:1  
 412:12  
**seasonal** 118:22  
 404:16 412:9  
**seasonally** 405:15  
**seasons** 404:13  
**seat** 5:21 9:6,12,16,20  
 10:8,13 11:1,6 12:2  
 70:9,14 255:17  
**seats** 10:1 11:21 103:16  
**seaweed** 249:20  
**second** 10:22 11:7,16  
 52:19 61:2 70:19 78:8  
 105:18 112:1 115:16  
 135:22 163:22 167:1  
 215:3 216:18 226:13  
 274:22 301:3 306:7  
 320:2 326:1 392:16  
 483:20  
**second-generation**  
 307:9  
**secondary** 309:9  
**secondly** 129:12  
 155:18 193:17 258:11  
 403:7  
**seconds** 286:18 357:4  
**secret** 356:14  
**secretary** 1:13 10:10  
 12:5 15:15,16 16:16  
 30:19 91:9 95:3,4  
 169:13,13,16,17  
**Secretary's** 4:5 12:5  
**section** 32:9 51:6 52:4  
 56:16 58:4 99:21  
 116:14 128:13 213:1  
 213:1 291:2 294:13  
 294:17 307:17 430:21  
 441:17  
**sections** 292:4 315:7  
 315:13  
**sector** 155:21 288:8  
 429:19 443:11  
**sectors** 115:3  
**securing** 290:10  
**security** 105:20 106:6  
 106:13 110:22 111:2  
 111:2 131:3 147:5  
 466:10  
**seed** 213:8 251:22  
 252:3,5 364:1 451:2

**seedling** 455:1  
**seedlings** 275:21  
**seeing** 12:13,16 89:21  
 155:22 283:12 362:8  
 417:19 462:10  
**seeking** 459:16  
**seeks** 284:2  
**seen** 74:8,9 148:7  
 277:16 307:2 336:15  
 370:22 447:12 460:6  
**sees** 489:19  
**Seitz** 1:18 10:21,21  
 84:22 85:15 86:2  
 184:8,18 185:14  
 186:11,18 188:6  
 272:16,21 317:13  
 371:21 373:9 386:22  
 387:10,17 404:1  
 405:10  
**SEKEM** 286:7,8  
**select** 137:20  
**selected** 91:8  
**selecting** 151:8 252:20  
**selection** 435:6  
**selenium** 231:19  
**self-** 342:6 345:1  
**self-regulating** 283:19  
**self-renewal** 342:1  
**self-renewing** 341:9  
 342:12 345:6 347:12  
**selfish** 361:22  
**sell** 48:5,8 172:13  
 177:20 242:1 280:9  
 280:10,14,15 288:17  
 372:3,6 380:18 395:9  
 407:18 420:16 449:21  
 450:12 453:22  
**seller** 454:9  
**sellers** 36:7  
**selling** 47:21 72:22  
 280:10 377:22 455:20  
 459:9  
**sellout** 306:18  
**semantics** 302:2  
**semi-desert** 265:4  
**semi-inert** 362:22  
**semi-natural** 296:15,19  
 300:8  
**Senate** 239:5  
**Senator** 365:6  
**send** 17:7 73:2 128:2  
 143:17 159:6 181:14  
 197:22 253:20 297:5  
 391:19 477:9,13  
 497:18  
**sends** 125:1  
**senior** 88:1,3 91:3  
 378:1 433:11

**sense** 18:12 66:8,11,20  
 70:7 84:9 108:14  
 260:17 326:16 331:11  
 331:19 360:11 395:1  
 400:22 488:5  
**sensible** 253:9  
**sensitivity** 63:17  
 189:11 360:12  
**sent** 162:14 174:8  
 355:4 391:1  
**sentence** 183:7 225:8  
 356:5 428:22  
**sentences** 476:5  
**separate** 15:7 29:2  
 55:13,14 65:9 253:1  
 307:12,22 308:9,10  
 308:11 314:5  
**separates** 92:1  
**September** 5:19 22:10  
 34:6,7 37:8 147:4  
 223:1  
**sequence** 457:6  
**sequester** 349:16 386:9  
 386:11,16  
**sequestered** 333:4  
**sequestering** 386:15  
 446:4  
**sequesters** 386:5  
**sequestration** 272:17  
 272:22 277:3,6,8,15  
 277:19 385:17 386:19  
 386:20 393:13 408:7  
**serious** 260:12 309:6  
**seriously** 244:8  
**servants** 355:4  
**serve** 14:14 17:11  
 111:17 113:12 290:1  
 389:22  
**served** 17:16 97:20  
 106:4 364:21 429:5  
 438:11  
**server** 268:1  
**serves** 105:13 141:20  
**service** 2:19 5:11 6:2  
 7:3 13:11 16:12 23:11  
 28:5 35:17 40:10  
 72:16 88:2,3 96:15  
 104:4 105:9 106:8,14  
 107:3 111:18 113:8  
 113:13,17,21 126:15  
 131:17 138:11 144:1  
 144:4 145:4,11 146:6  
 146:6,8,8 147:17  
 155:3,11 169:9 222:6  
 293:4 356:1 389:22  
 390:3 417:11 430:11  
 433:6 444:17 478:7  
**Service's** 223:3

**services** 108:12 113:1  
 134:22 143:16 196:15  
 442:4  
**serving** 5:15 17:19,20  
 51:17 53:9  
**SES** 88:2,3,4,4,5,9,9,14  
 88:15,21 89:15,16,17  
 90:10 91:5  
**SEs** 90:20  
**session** 292:1  
**set** 38:17 44:1,2,8 46:6  
 46:7 68:16 88:22 89:3  
 106:20 107:4,5  
 112:12 127:5 133:7  
 136:5,5 141:17,19  
 142:9 167:5,6 168:16  
 174:5,11 176:21  
 182:18 226:8 261:15  
 319:13 376:15 391:15  
 401:15 421:2 443:12  
 460:9 468:19  
**sets** 26:21 112:7 115:18  
 126:21,22 136:7  
 159:6,8 160:4 174:8  
 176:22 182:19 193:16  
**setting** 92:22  
**settings** 455:9  
**settlement** 25:10  
**seven** 34:7 126:8  
 218:11 309:18 321:10  
 339:6 408:18  
**sewage** 261:20  
**shade** 235:13  
**shake** 479:21  
**shaking** 479:20  
**shales** 229:18  
**shallow** 449:7,20  
**shamelessly** 453:12  
**shape** 51:10  
**share** 13:9 42:10 247:1  
 335:4 352:18 373:20  
 380:15 421:12 459:6  
 473:20  
**sharecropping** 450:1  
**shared** 30:18 49:18  
 71:13 137:15  
**sharing** 155:16 166:1  
 367:16  
**Shea** 15:19  
**shed** 107:21  
**shell** 114:18,19,20  
**shift** 143:21  
**ship** 101:11 117:11  
 127:22  
**shipboard** 118:11  
**shipment** 43:1 44:5  
 47:11,16 48:1,10  
 113:4 118:10,11

123:22 125:5,16  
 137:18 152:12,16  
 180:7,18 182:9  
 195:18 202:10,15,19  
 202:21  
**shipments** 31:1 48:22  
 66:16 104:6,11 135:6  
 153:9,10 162:5 180:5  
 180:5 183:15 185:10  
 185:17 193:3 197:11  
**shipped** 104:7  
**shipper** 120:13 125:6  
**shippers** 119:4  
**shipping** 117:11  
**ships** 65:14 189:2  
**shoes** 59:21  
**shop** 126:16  
**short** 31:18,18 71:9  
 121:15 189:5 350:14  
 450:3 453:6  
**short-term** 340:18  
**shortcut** 315:3 316:2  
**shortcuts** 315:2  
**shortcutting** 93:1  
**shortens** 150:4  
**shorter** 497:6  
**shorthand** 402:10  
**shot** 283:8  
**show** 50:11 120:7 357:2  
 360:20  
**showed** 20:9 391:17  
 434:20 487:17  
**showing** 176:19 352:2  
**shown** 314:1  
**shows** 367:7 434:18  
 438:12  
**sick** 467:14  
**side** 5:20,20 22:6 123:5  
 138:9,9 142:12 145:1  
 146:2,2 163:20,21  
 180:16 196:7,8 287:2  
 327:4,13 336:5 448:8  
 470:3 479:20,21  
**side-by-side** 433:14  
**sides** 44:20 319:14  
 450:2  
**signal** 122:16 125:20  
**signature** 56:20  
**signatures** 58:14 363:8  
**signed** 15:9 375:3  
**significant** 25:1 57:17  
 71:16 127:11 157:5  
 169:7,7 298:5 489:22  
**significantly** 55:11  
 300:10 325:13  
**silence** 100:12,12  
 224:12  
**silos** 232:5

**silver** 212:13  
**similar** 42:5 154:2  
 160:12 186:14 188:9  
 218:20 248:10 312:16  
 419:3 438:17 443:8  
 479:12 492:18 493:2  
 493:12  
**similarities** 308:11  
**simple** 179:1 276:9  
 311:10 314:12 332:12  
 382:17 384:14 393:15  
 394:4 460:12 462:2  
 464:7 483:11  
**simpler** 320:5 425:3  
**simplified** 476:11  
**simply** 213:20 252:4  
 253:2 340:17,22  
 341:18 344:17 383:22  
**sincerely** 348:3  
**single** 110:10 121:20  
 122:9 137:10 185:7  
 197:17,18 198:1  
 237:13 448:12 489:16  
 489:20  
**single-window** 110:12  
 131:15  
**sir** 240:14 453:12  
**sit** 9:7,22 10:7,12 11:6  
 11:20 12:1 14:9 176:3  
 192:6 227:7 251:12  
**SITC** 147:20  
**site** 29:4 120:13 279:6  
 380:20 425:19,22  
 426:2,3 444:4 496:4  
 497:10  
**site-** 296:21  
**site-specific** 236:11  
 349:6  
**sites** 279:5 280:3  
 296:17  
**sitting** 5:21  
**situation** 126:6 127:14  
 249:13 288:3 300:12  
 353:12 439:11 454:15  
 461:9  
**situations** 300:9 397:14  
 451:10 473:2  
**six** 5:21 13:7 89:11 95:2  
 217:15 218:11 400:3  
 430:13,14,15 476:16  
 488:16  
**sizable** 359:21 360:3  
**size** 117:4 232:8 310:9  
 310:15 391:15  
**sizes** 117:18  
**skilled** 53:13 165:14  
**skills** 91:1 165:18  
**skin** 234:10,13,16,21

235:2 284:8  
**skip** 488:20  
**skyrocketed** 265:12  
**slaughterhouses** 36:5  
**sleight** 410:22  
**slide** 47:2 110:14 218:9  
 219:8 226:13 283:6  
 357:2 360:20  
**slides** 107:14 117:16  
 130:19 152:6 155:22  
 156:8 224:11 225:17  
**slightly** 438:21  
**slippery** 244:15 366:7  
**slogan** 357:8 453:11  
**slope** 244:15 366:7  
**sludge** 392:18  
**slurry** 452:12  
**small** 10:13 53:9 77:6  
 228:9,19 253:6 256:8  
 261:1 267:9 355:17  
 391:17 410:5,15  
 415:20 460:19 462:4  
 489:9  
**smaller** 280:18 500:4  
**smelly** 317:4  
**Smith** 3:11 272:19  
 273:3,18 282:17  
 289:18,21,22 293:9  
 293:13 294:6,22  
 295:3 312:6  
**Smithsonian** 147:17  
**Smuggling** 147:19  
**snakes** 483:7  
**snuck** 81:18  
**so-called** 275:10  
**social** 287:2 343:15  
 384:9  
**Society** 227:20  
**sodium** 21:12,13 210:7  
 212:14,15 220:22  
 236:16 262:14 317:7  
 434:4,17 437:2 438:5  
 438:9,18 443:1,3,9  
**software** 39:12 194:6  
**soil-** 275:17 387:7  
**soil-based** 272:18  
 273:1 274:21 311:5  
 338:8 343:1 404:5  
 415:10 500:11  
**soil-grown** 250:4 289:7  
 407:12 458:13 462:3  
 462:7  
**Soil-less** 428:7  
**Soil-organic** 304:5  
**soil-related** 276:3  
**soilless** 252:11  
**soils** 277:4 284:7  
 301:19 314:16 333:3

333:9 381:6 449:20  
**sold** 48:17 49:11,17  
 50:5 60:14 61:15  
 177:18 181:20 417:6  
 472:21  
**sole** 377:1  
**solid** 232:1 259:18  
 270:12 480:7,10,13  
**solidify** 232:4  
**Solomon's** 306:3  
**soluble** 228:8,21  
 230:16 236:17,20  
 260:2 263:12 267:3  
 318:2,10 480:14  
 488:6 494:21 495:5  
**soluble-** 318:7  
**solution** 228:9 253:10  
 264:19 265:8,9,11  
 310:22 311:7 375:8  
 386:7 414:7 423:14  
 452:3 480:16 492:2  
**solutions** 182:18  
**solve** 489:15  
**solved** 490:19  
**somebody** 89:16  
 161:10 174:3,6  
 177:14 306:5 370:4  
 381:15 472:9  
**somebody's** 411:6  
**somewhat** 367:14  
 393:21 417:9  
**son** 306:6  
**Sonny** 15:15  
**sons** 314:4  
**soon** 63:14 108:18  
 122:13 219:5 391:10  
**sooner** 78:20  
**sophisticated** 28:12  
 198:5 356:20 362:9  
**sorry** 21:15 70:11 73:5  
 90:3,14 97:22 131:20  
 231:7,10 234:14  
 240:15 255:17 272:19  
 312:1 322:12,17  
 324:7,10 325:16  
 345:3 360:4,19 396:9  
 406:16 415:5,6  
 419:21 429:14,14  
 439:17 440:4,19  
 457:16 458:4 471:6  
 472:13 474:10 488:20  
 489:1 495:20  
**sort** 21:19 61:17 64:5  
 65:18 67:9 83:3 87:20  
 88:19 89:1 137:6  
 138:12 141:8 186:9  
 246:14 247:19 249:20  
 250:11 272:10 316:12

320:4 330:12 353:3,8  
 353:15 380:14 391:4  
 418:1 491:21 496:12  
**sorts** 43:19 496:18  
**sound** 290:18  
**sounds** 184:11,18  
 191:14,15 426:11  
 455:20  
**soup** 384:22 388:20  
**source** 230:14 256:16  
 262:19 263:1,2 312:8  
 467:1 473:17  
**sourced** 385:1  
**sources** 20:5 32:21  
 230:19 259:2 262:9  
 262:16 265:18 317:2  
 494:4  
**South** 117:22,22 317:2  
**Southern** 420:16  
**Southwest** 361:5  
**soy** 104:6 262:13  
 311:19 312:7  
**soy-based** 265:20  
**soybean** 236:19 262:14  
 265:19  
**soybeans** 189:8  
**space** 250:9 270:2  
 391:2 460:21  
**Spargo** 311:21  
**sparked** 64:20  
**speak** 15:9 144:9  
 194:18 231:21 242:4  
 253:16 274:2 287:11  
 296:1 339:16 348:12  
 377:17 397:10 409:12  
 416:18 436:19 458:21  
 465:18 482:12  
**speaker** 277:2  
**speaking** 39:15 276:18  
 353:5 389:13 445:19  
**speaks** 142:2  
**special** 6:6 44:16  
**specialist** 2:2,5,14  
 18:22 72:8 105:21  
 153:5  
**specialists** 18:21 24:3  
 150:16 152:21  
**specialization** 474:18  
 485:16  
**specialized** 89:1  
**specialty** 2:18 105:18  
 109:11 114:15 115:2  
 190:4,4,8  
**species** 296:13 297:11  
 300:6 344:5,7,8,10  
 453:1  
**specific** 27:18 31:15  
 33:6 51:2 57:6 93:20

100:6 109:2 110:7  
 114:20 116:15,19,21  
 142:19 157:11 159:18  
 164:2,4 259:20 444:4  
 484:7  
**specifically** 30:6  
 145:19 149:6 155:15  
 235:19 237:17 261:18  
 266:5 278:17 292:3  
 302:16 371:16 376:21  
 436:17  
**specifics** 53:1 75:9  
 162:15  
**specified** 286:2  
**specify** 50:21 291:2  
**spectrum** 247:6 381:6  
**speed** 71:8 226:22  
 227:1  
**speeding** 154:14  
**spell** 176:12  
**spelled** 129:14  
**spells** 146:22  
**spend** 38:9 72:12  
**spending** 62:19 109:14  
 197:15 269:10 445:4  
**spent** 268:10 315:20  
 367:9 384:4  
**Spice** 9:18  
**spiders** 483:7  
**Spiral** 2:13 392:9 395:2  
 395:4  
**spiraling** 461:9  
**spirit** 268:22 354:5  
 365:13,22 366:17  
 388:6  
**split** 200:21,22  
**splits** 299:19  
**spoke** 104:9 130:21  
 205:16 352:15  
**spoken** 298:15  
**spot** 175:2 184:16  
 185:3 199:19 469:14  
**spot-checking** 184:13  
**spouse** 102:5  
**spray** 234:4 384:14,15  
 417:12  
**sprayed** 339:8  
**spraying** 414:7  
**spreadsheet** 25:4  
**spreadsheets** 121:14  
**spring** 59:3 210:5  
 216:17 217:11,14  
 218:4 412:14 489:3  
 491:18  
**Springs** 11:18  
**sprouts** 236:6 275:21  
 391:11  
**sprung** 315:11

**SQF** 463:11 464:16  
**stability** 485:22  
**stabilize** 34:15  
**stable** 158:18 193:18  
 316:20 341:3 486:21  
 487:1,2,12  
**staff** 2:1 18:9 23:14  
 35:13 45:2 55:8 71:2  
 71:9 72:17 95:16  
 129:19 239:8 256:9  
 265:17 355:8  
**staffing** 93:14  
**stage** 106:20 107:4,5  
 167:19 170:6  
**stages** 162:9 167:15  
 487:13  
**stainless** 232:4  
**stake** 114:10 169:11  
**stakeholder** 140:6  
 154:16,18 219:19  
 298:2 458:10  
**stakeholders** 130:8  
 134:4 219:20 223:12  
**stamp** 119:22  
**stance** 195:12  
**stanchions** 100:15  
**stand** 32:13 33:12  
 69:12 180:2 204:2  
 304:1 331:15 332:6  
 375:4 385:21 463:14  
**stand-** 378:17  
**standard** 52:9 53:7 82:4  
 92:22 129:5,10 150:2  
 186:13 243:5 252:3  
 257:6 272:14 288:2,6  
 288:15 293:22 312:17  
 370:14,17 371:4  
 402:3 421:17 433:22  
 448:9 456:21,22  
 468:22 477:8 500:18  
**standards** 1:3 2:4 5:6  
 18:17 21:8 26:14,21  
 31:10 41:9 42:4 53:13  
 69:16 104:2,14  
 107:17 115:6 117:3,4  
 117:19 118:2 119:3  
 120:4 195:14,19  
 201:20 242:9 243:17  
 244:1 252:10 280:8  
 315:12 325:8 345:8  
 353:20 373:5 376:15  
 401:16 402:8,9 421:2  
 421:4,5,20 431:4  
 432:12 434:3,17  
 435:13 443:12 444:1  
 460:12 464:13 468:18  
 475:5 485:15  
**standing** 22:22 80:12

203:7 339:18 478:11  
**Standish** 3:11 255:14  
 255:16,21,22 260:1  
 260:22 262:12,17  
 263:2,22  
**standpoint** 118:19  
 125:18 128:21 186:19  
 335:15  
**stands** 43:14 88:3  
 90:13 182:21 475:6  
**start** 9:3,4 12:22 39:11  
 59:2 99:20 103:7,17  
 120:21 121:13 126:12  
 144:8 160:4 163:14  
 166:19,21 182:9  
 206:3,5 217:11 224:8  
 225:1,4,19 226:7  
 227:12 231:11 235:8  
 241:13 243:22 251:8  
 255:19 256:19 264:3  
 267:7 268:7 273:20  
 276:21 281:12 283:3  
 283:6,15 289:19  
 296:4 308:19 313:9  
 322:3 325:17 329:10  
 330:3 334:8 339:12  
 344:16 347:19 348:3  
 354:13 356:17 363:15  
 368:1,6 374:11  
 377:14 382:6 389:3  
 392:6 396:7 401:6  
 409:7 416:14 420:11  
 427:7 441:8 449:1  
 458:6 474:10 484:1  
 499:14,18 501:16  
**started** 5:4 51:13,16,21  
 92:13 93:16 103:15  
 132:3 156:13 164:5  
 166:3 174:2,7,9 227:3  
 241:21 264:15,16  
 266:1 279:17 282:7  
 316:15,17 329:18  
 330:16 365:4 409:14  
 409:21 416:22 417:5  
 417:15,19 418:9  
 421:1 432:4,21 449:6  
 449:15 450:1,13  
 484:15  
**starting** 16:2 66:4 158:6  
 160:9 162:21 173:13  
 174:16 273:11 295:18  
 329:12 457:13 459:13  
 498:5  
**starts** 124:13 225:2  
 266:7 270:17 349:13  
 390:20 440:6  
**starves** 310:21  
**state** 3:4 10:3,4 11:5

38:14 106:16 119:2  
200:18 261:2,3  
282:21 297:6 298:1  
311:22 386:3,8 390:7  
394:4 401:18 413:16  
488:13  
**stated** 70:21 290:19  
291:8 292:6 294:18  
431:2 445:21  
**statement** 37:20 100:7  
237:2 279:17 291:16  
357:13  
**statements** 100:6  
**states** 1:1 29:19 43:2  
43:19,20 117:2,9,12  
117:21 118:5,21  
129:15 132:1 146:14  
146:21 149:5,7,14  
151:13 152:14 185:8  
187:18 193:4 256:19  
294:14 322:20 323:3  
376:21 393:4 401:14  
421:19 428:1  
**stating** 225:20 342:22  
355:5  
**stations** 153:19  
**statistical** 114:3  
**statistics** 92:9  
**stats** 96:3,3  
**status** 8:9 32:18 38:4  
203:17  
**statuses** 35:8  
**statute** 110:7 116:16  
176:2 207:10 208:3  
208:12 215:8  
**statutes** 172:4  
**statutory** 139:16,19  
177:5 189:22 315:12  
**stay** 102:9 140:20  
163:13 328:17 501:16  
**stays** 270:17 297:16  
501:5  
**steel** 232:4  
**Steering** 427:12  
**stemming** 362:2  
**step** 17:2 108:21 160:2  
167:19 173:17 290:9  
435:18  
**stepped** 453:2  
**steps** 39:3 104:10  
148:15 150:13 151:6  
151:22 160:8 438:3  
**sterile** 273:11  
**Steve** 1:16 9:21 15:16  
197:2 244:9 245:3  
260:8 269:18 276:21  
316:10 328:13 332:22  
333:18 385:13 406:17

407:3 444:21 445:1  
446:18 451:14 453:20  
478:10  
**steward** 304:8 478:5  
**steward** 314:18  
**stewardship** 315:4,9  
351:4 353:14 441:22  
**stick** 175:1  
**stifle** 442:13  
**stock** 93:9 370:6,20,21  
371:1  
**Stokie** 408:19  
**Stokke** 3:12 360:2,6  
367:22 374:13,14  
377:12  
**stole** 92:8  
**stomach** 384:2  
**stone** 380:1 407:21  
**stop** 73:4,4,5 146:17  
172:10,10,13,22  
173:5,6 178:19 179:5  
250:1 282:6 287:5  
312:5 318:15 347:15  
360:8 394:20 423:9  
440:22  
**stopped** 15:21 28:8  
**stops** 320:7  
**store** 44:3 102:10 232:5  
**stored** 58:6 232:14  
**stores** 401:14 407:12  
408:16 410:8  
**story** 245:13 415:18,19  
415:19,20,22 450:3  
470:13,16  
**Stowe** 323:8  
**straight** 226:8 255:17  
261:16 301:22 488:17  
**straightforward** 382:17  
425:5  
**strategy** 252:21  
**straw** 488:4  
**strawberry** 474:8  
**stream** 44:8  
**streamline** 129:22  
**streamlined** 111:6  
**streamlines** 150:4  
**streamlining** 154:5  
**Street** 1:9  
**strength** 327:17  
**strengthen** 251:21  
**strengthening** 276:2  
460:11  
**stress** 292:18 444:8  
**strict** 325:15  
**stricter** 279:22  
**striking** 446:14  
**striving** 254:4  
**strong** 53:10 95:12,16

128:11 270:17 279:20  
301:13 302:16,21  
305:11 423:21 456:8  
**stronger** 77:11,22  
175:11  
**strongly** 85:5 236:14  
239:12 276:14 435:2  
435:19 473:20 489:8  
**structure** 16:9 139:10  
163:7 398:9 488:9,10  
**structured** 36:9,14 88:6  
161:21 164:10  
**struggle** 55:1 92:18  
93:3,13 410:1  
**struggling** 288:22  
**stubborn** 350:3,6  
**students** 97:1 445:5  
**study** 118:17 124:9  
193:2 265:16 315:18  
347:5 362:13  
**stuff** 196:16 267:1  
326:15 327:1 367:7  
419:5 469:10 473:14  
**stupid** 487:11  
**subcommittee** 8:14,16  
12:3 79:17 82:12 83:5  
99:21 207:1 208:14  
209:13 210:2 211:7  
211:12,16 212:5,7,8  
212:21 213:11 214:8  
218:15 229:10 256:3  
274:7 297:5 359:11  
365:4 381:13 397:1  
398:6,15 428:10  
435:20 436:6 441:13  
461:18 477:9  
**subcommittee's** 304:16  
312:13 318:18 368:8  
427:19 435:10  
**subcommittees** 218:6  
219:6  
**subcontractors** 220:12  
**subfolder** 156:11  
**subject** 30:10 150:6  
295:14 313:16 319:11  
331:12 445:20  
**subjected** 129:2 230:3  
**subjective** 408:5  
**subjects** 360:10  
**submission** 141:16  
**submissions** 207:22  
**submit** 15:4 152:22  
210:19 241:4  
**submitted** 71:5 136:12  
210:3 213:6  
**submitting** 46:5  
**subscriptions** 143:16  
**subsequent** 85:3,18

**subsequently** 376:16  
**subsets** 199:15  
**subsoil** 275:19  
**substance** 48:19 85:2,9  
85:17 179:2 207:15  
208:6 213:14,15,16  
213:17 214:6 215:4  
216:21 228:13 230:19  
368:10,12,15,16  
373:11 437:22 439:10  
439:13  
**substances** 19:15,17  
20:7,10,18,21 21:11  
48:6 134:11 208:5  
210:12 212:22 213:2  
214:1,10,16 215:15  
227:20,21 368:11  
373:14 437:10 439:9  
**substandard** 129:3  
**substantial** 263:13  
439:15  
**substitute** 76:4,14  
384:1  
**substitution** 314:12  
366:20 384:13,17,19  
384:22  
**substrate** 81:9 258:11  
258:13,14,16 259:3  
260:6 267:8 384:4  
388:1  
**substrates** 452:8 455:7  
**suburbanized** 390:10  
**success** 13:8 35:20  
109:6 129:7 153:20  
223:4,20 242:4 301:8  
**successes** 28:12 41:1  
**successful** 34:18  
109:10 246:15 316:7  
463:11  
**successfully** 303:3  
421:12  
**successor** 132:9  
**succinct** 226:19  
**sudden** 410:8  
**suddenly** 403:5  
**Sue** 1:13 11:8 247:22  
286:5 405:12 411:22  
413:1 439:16 451:14  
471:4,8 488:19,21  
492:7 493:10  
**suffering** 77:6  
**sufficient** 172:1,5  
209:16 237:21 294:11  
325:2 398:14 457:3  
**sufficiently** 167:8  
**sugars** 393:15  
**suggest** 473:20  
**suggested** 177:12

398:16  
**suggesting** 255:6  
 321:14  
**suggestion** 230:11  
 281:16 463:19  
**suggestions** 140:17  
 241:4 254:13  
**suitable** 493:8  
**sulfate** 21:12 370:2,18  
**sulfated** 424:7  
**sulfonate** 212:16  
**sulfur** 3:5 210:7 211:10  
 231:13,13,17,19  
 232:8,15 234:10  
 397:17,20 398:1  
 400:21 500:3,17,20  
 501:3  
**sum** 284:7  
**summarize** 22:8  
**summary** 4:16 29:8  
 132:19 155:5 206:13  
**summer** 22:1 25:3  
 28:20 29:6 162:15  
 217:22 491:7  
**Summers** 16:7 91:11  
**sun** 332:19  
**sunset** 13:16 19:13  
 80:11 207:5,9 209:7  
 213:14 215:16,16,18  
 215:21 216:4,8,12,15  
 216:16 217:3,4,8,10  
 217:16,19,21 218:1  
 218:12,17 219:14  
 356:7 369:1 396:17  
 396:22  
**sunsets** 217:9  
**super** 32:4 319:21  
**superb** 73:11  
**superior** 356:22 362:20  
**Supervisor** 389:11  
**supper** 450:10  
**supplement** 455:22  
**supplied** 235:22 257:8  
**supplier** 262:21  
**suppliers** 327:6  
**supply** 26:10 28:22  
 38:10 160:10,14,17  
 160:19 161:4 164:6,7  
 164:9,16 165:15  
 177:13 178:13 198:1  
 202:8 290:6 342:21  
 349:11 374:7 404:20  
**support** 22:3 31:11,14  
 31:20 39:12,20 45:7  
 67:9 93:14 106:11  
 126:9 145:17 205:14  
 218:1 219:13 224:3  
 239:8,12 252:9

259:10 290:9 292:14  
 297:11 298:2 304:15  
 305:4 312:13,22  
 324:14 325:21 333:22  
 334:1 358:5,10  
 359:12 366:14,16  
 381:13 386:4 395:15  
 396:3 399:4 407:1  
 415:1,8 420:2 427:18  
 435:2,9 436:6 456:5  
 459:7 460:15 461:20  
 476:18 477:7  
**supported** 67:3 82:18  
 129:13  
**supporter** 441:18  
**supporters** 331:15  
 332:2  
**supporting** 198:14  
 259:12 296:22 303:19  
 363:10 366:2  
**supports** 30:19 45:5  
 253:1 292:16 345:1  
**suppose** 200:3 383:16  
 414:12  
**supposed** 197:8 354:6  
 491:4  
**surface** 424:1  
**surprise** 402:18,22  
 403:7  
**surprised** 350:19  
 446:15  
**surprising** 74:4  
**surprisingly** 418:1  
**surrounded** 300:14  
**surrounding** 102:2  
**surveillance** 62:20  
 147:22  
**survey** 148:1 269:4  
 279:17 434:7,20  
 435:11 436:16  
**surveys** 268:13 269:4  
 436:19  
**survive** 418:5  
**suspect** 45:20 185:17  
 186:11,12 247:12  
 403:6  
**suspended** 24:16,17,20  
 26:1 302:9  
**suspensions** 25:9  
 26:18  
**sustainability** 268:11  
 337:1 351:4 352:11  
 379:9 390:17 392:1  
**sustainable** 34:12  
 239:6 256:14,22  
 259:11 269:11,16  
 308:13 317:11,15  
 375:8 433:18 441:22

442:9 443:15,21  
 444:6,10 445:12  
 463:9 473:21,22  
 490:19  
**sustains** 284:1  
**Swaffar** 1:12 10:11,11  
 81:17 82:8 240:21  
 244:10 259:15 260:8  
 262:6 263:4 282:7,12  
 337:14 338:1,3,5,21  
 358:3,9 406:18 412:1  
 412:5 419:13,16,19  
 422:12,15 441:1  
 492:8,16  
**Sweden** 275:13  
**sweet** 413:14 418:14  
**swimming** 467:6  
**switched** 317:1  
**Switzerland** 46:2  
**sworn** 15:22 16:5  
**symbolism** 460:11  
**sync** 461:4  
**synthetic** 208:10  
 213:16 214:21 228:9  
 228:13 246:20 340:14  
 346:9 368:10 369:4,5  
 396:19 398:4,7,13  
 399:10 402:13  
**synthetically** 230:14  
**Syracuse** 106:17  
**systems** 61:13 69:12  
 69:18 111:10 116:3  
 123:8 149:16 157:18  
 158:19,21,22 162:17  
 163:6 167:5,16 172:2  
 179:22 180:14 194:6  
 243:1 252:12,18,18  
 252:20 264:17 265:13  
 269:22 272:3 277:5,7  
 277:17 286:2 302:2,4  
 303:12 305:14,16  
 316:12 338:16,18,18  
 338:19 384:6,19  
 386:1,2,5 428:7 436:3  
 444:3 456:9 466:3  
 473:21,22 474:20  
 476:13 478:18 492:12  
 493:15

---

**T**


---

**T** 4:1,1  
**tab** 12:9  
**table** 116:22 164:10  
 305:17 363:11 429:13  
**tacit** 391:4  
**tackling** 290:9  
**tactics** 459:22  
**tail** 361:17

**taken** 24:21 25:13,17  
 25:19 73:20 104:10  
 136:10 144:20 169:19  
 197:14,14 283:8  
 333:5 393:9 403:11  
 453:12,13 496:4  
**takes** 6:9 27:8 30:12  
 72:9 126:14 139:22  
 150:2 161:11 173:21  
 246:16 303:14 314:22  
 473:7  
**takings** 298:22 299:14  
 299:14  
**talk** 13:13,16 28:11 31:8  
 42:1 47:5,8 87:19  
 114:12 121:18 131:10  
 131:11 136:5 144:5  
 149:22 156:9 157:6  
 164:5 174:19 226:20  
 269:20 271:20 339:1  
 351:2 358:7 383:6,7  
 392:15 425:19 450:8  
 470:7 471:15,22  
 472:16 473:5,9,13  
 488:2  
**talked** 112:17 173:13  
 244:10 306:5 307:14  
**talking** 46:12 62:19  
 80:17 81:1 92:14  
 110:1 118:6 139:8,9  
 178:18 183:11 205:18  
 225:4 240:8,9 271:17  
 271:18 298:7 305:13  
 331:6 333:9 378:15  
 379:19 381:4 426:4  
 437:2 454:6 469:10  
 480:12  
**talks** 116:6  
**tamarind** 213:8  
**tank** 231:22 232:2  
**tape** 357:2  
**target** 232:22 495:9,11  
**targeted** 258:1  
**targeting** 481:5  
**tariff** 180:9 183:12,17  
 183:22  
**tartrate** 213:13 368:9  
 368:14  
**task** 309:3  
**tastes** 438:20  
**tasty** 414:14  
**taught** 337:3,5  
**taxes** 417:8  
**taxonomies** 35:9  
**taxonomy** 36:8 38:15  
 182:1  
**Taylor** 3:12 227:10,14  
 227:15

- teach** 350:17 403:3  
**teaching** 72:17  
**team** 7:9 18:8,10,14  
 19:6 24:1 35:4,4  
 59:12 126:18 196:20  
 358:2 489:14  
**teas** 259:19  
**teat** 211:18  
**technical** 88:22 89:2  
 207:19 208:1 210:4  
 211:11,13 212:2,11  
 212:18 213:9 214:12  
 217:22 218:3,6,20  
 219:9,11,12,18  
 223:14 264:19 265:8  
 265:17 357:4 368:4  
 371:13 400:8  
**technically** 90:22 138:1  
 281:6 454:8 471:16  
**technique** 464:6  
**techniques** 304:7 435:5  
**technological** 444:12  
**technologies** 35:16  
 39:19 160:12,13  
 163:12 354:4 442:7  
**technology** 17:17 31:16  
 31:19 34:3 39:8 44:7  
 47:1 59:8 108:13  
 111:16 126:15 128:15  
 149:10 159:2 161:2  
 163:20 165:4 194:11  
 332:4 460:15  
**teens** 449:7  
**tell** 49:13 75:1 96:5  
 262:9 336:8 374:22  
 378:18 379:17 384:18  
 386:8 388:18 389:16  
 392:21 412:5 413:4  
 422:15 423:11 425:22  
 440:12 445:11 470:10  
 470:11,11 475:5  
 484:13,22  
**telling** 49:21,21 431:7  
**tells** 24:19 49:7 125:14  
**tellurium** 231:19  
**temperature** 486:9,11  
**template** 58:17 207:18  
**temporarily** 89:16  
**temporary** 17:12  
 179:16 335:10  
**ten** 118:11 366:6 416:9  
 483:2  
**ten-fold** 127:10  
**TenBroeck** 3:13 458:4  
 463:1,3,5,6 466:14,20  
 467:2 468:1,17 470:1  
 470:20 471:2,8,14  
 472:18
- tend** 267:8 289:6  
 339:22  
**tends** 318:11  
**tenet** 301:15  
**tens** 120:20  
**tenure** 95:17  
**term** 34:13 35:19 44:1  
 65:17 66:7 87:11  
 110:16 126:21 140:4  
 141:7 160:22 253:22  
 393:20 419:8 430:11  
 432:5  
**terminology** 435:4  
**terms** 42:15 44:9 65:8  
 72:18 81:7,10 83:16  
 84:4,20 89:4 105:4  
 106:21 107:4,6 109:1  
 109:8 114:13 130:21  
 131:1 155:10,14,19  
 155:20 162:15 164:19  
 166:13 192:16 205:21  
 207:6 209:1 214:14  
 216:4 229:11 268:21  
 269:15 270:19 317:17  
 340:15 341:21 343:16  
 344:3,17 370:9 372:4  
 372:10 425:14 450:20  
 466:17 496:20  
**terrestrial** 229:16  
 284:17 383:12 395:22  
**terroir** 451:1  
**test** 32:20 130:10 141:8  
 141:16 185:16 186:3  
 186:4,5 246:14  
 268:12 367:2  
**testament** 283:14  
**tested** 186:9 288:7  
 442:5  
**testified** 239:5 348:14  
**testify** 325:21  
**testimony** 85:16 100:18  
 329:22 348:18 359:15  
 367:3 382:4 396:5  
 407:7 489:3  
**testing** 27:18 33:7  
 141:10 165:13 185:18  
 230:5 428:15,18  
 496:15  
**tests** 33:8 74:14 232:22  
 248:2 303:17  
**thanking** 59:14 166:5,9  
 348:3 396:15  
**thanks** 13:14 15:14  
 19:2,10 75:7 81:17  
 91:16 131:6 157:7  
 166:6 178:5,14 188:6  
 192:2 220:15 251:4  
 273:18 276:22 293:18
- 377:16 424:8 427:3  
 433:5 474:12  
**that'd** 177:17  
**thee** 405:19  
**Theo** 231:7 240:21  
**Theojary** 2:16 231:6  
 235:6,11  
**theory** 283:18 284:1  
**THF** 3:13 463:7  
**Thicke** 1:19 6:15 11:22  
 11:22 73:18 74:8  
 76:15,22 177:11  
 239:4 240:15,18  
 266:19 267:2 276:16  
 280:5,19 281:14  
 379:17 387:20 388:16  
 487:6 488:11  
**thin** 284:18  
**things** 7:10 63:10 64:11  
 65:9 67:6 71:8 77:22  
 79:1,3 116:13,17  
 122:4 128:3 131:9,11  
 136:15 138:14,15,16  
 140:3,19 143:9,10  
 152:12 178:7 181:9  
 185:20 188:20 197:20  
 214:14,19 239:1  
 240:9 242:17 243:3  
 245:12 249:4 250:21  
 251:20 270:18 271:21  
 336:6 360:14 365:3  
 385:10 389:16 394:13  
 403:3 417:10,16  
 429:12 447:18 454:16  
 456:3 462:19,21  
 469:3,5 478:15 480:8  
 483:10 484:5,11  
 485:9,11 496:15,21  
 500:12 501:4  
**thinkers** 337:1  
**third** 9:12 10:19 106:6  
 152:19 164:14 170:22  
 276:1 362:17,17  
**Thoreau** 77:15  
**thorough** 30:8  
**thought** 34:8 78:10  
 156:22 190:19 225:8  
 255:1 319:6 334:16  
 334:18,21 367:5,15  
 367:18 431:4 439:18  
 477:16 484:10 485:1  
 492:2  
**thoughtful** 96:16 477:3  
**thoughtfulness** 96:8  
**thoughts** 109:5 200:14  
 319:3 433:4  
**thousand** 15:2 22:15  
 120:20
- thousands** 29:5 120:19  
 120:20  
**thread** 198:15  
**threat** 304:4  
**threatened** 349:11  
**three** 11:18 12:20 19:16  
 19:19 20:6,9,17 32:11  
 41:12 42:13 44:10,13  
 48:12 52:11 56:5  
 74:11 98:12 106:19  
 115:15 120:14 126:7  
 126:12 127:13,14  
 152:15 156:8 157:8  
 169:15 187:1 194:13  
 212:16,21 224:21  
 226:20 241:18 246:6  
 246:8 247:16 250:19  
 259:6 274:9 316:21  
 326:1 356:2 360:10  
 364:7 367:6 392:18  
**three-** 274:10  
**three-fold** 191:20  
**three-quarters** 310:3  
**threshold** 186:6,7  
 192:16 215:7  
**threw** 346:2  
**thrive** 303:1 417:22  
 481:12  
**thrives** 310:22 311:7  
**thriving** 418:19  
**throw** 102:11 127:6  
**throwing** 238:22 419:5  
**thrown** 109:13  
**Thursday** 7:4 8:15  
**thymol** 211:22  
**tight** 101:11  
**tightly** 283:21  
**till** 386:7,8 412:14  
 416:10 479:16 485:5  
 501:18  
**tillage** 377:3  
**tilling** 370:10  
**time-consuming** 316:3  
**timeline** 132:22 140:22  
 173:12  
**timeliness** 121:3  
**timely** 41:17 50:8,12  
 54:5 61:14  
**timer** 12:22 224:22  
**times** 60:18 74:11  
 94:10 171:21 246:8  
 253:18 274:10 298:16  
 310:15 318:1 339:6,8  
 348:14 351:1 407:15  
 445:8,9 450:19  
**timing** 84:21 427:2  
**tired** 299:3  
**tireless** 251:17

- tirelessly** 349:18  
**tobacco** 370:1,10,15,17  
 370:22 371:5,11  
**tocopherols** 213:22  
**today** 5:21 6:1 7:14 9:3  
 13:4,13 14:9 16:2  
 17:7 34:22 51:11 95:1  
 102:3,7,14 107:21  
 108:7 109:18 113:14  
 121:18 138:21 144:9  
 144:14 147:11 155:3  
 155:22 166:2 169:21  
 199:2 205:12 206:17  
 206:19 227:15 228:4  
 231:13,20 232:1  
 240:1 292:11 293:15  
 297:12 313:15 314:3  
 322:16 331:3 335:2  
 337:9 348:6 361:4  
 365:12 378:7 389:13  
 396:16 430:19 463:14  
 474:17  
**today's** 104:18 166:11  
**toiling** 168:6  
**told** 50:14 74:21 169:19  
 423:7 451:17  
**Tom** 1:9,12 2:9,10 6:6,7  
 7:11 10:18 103:21  
 166:8,17 182:12  
 205:14,21 263:4  
 276:16 310:13 322:3  
 324:8 325:11,11,13  
 325:17,19 326:5  
 328:11 329:7 374:13  
 424:11 448:21 458:3  
 458:6,10 478:12  
**tomato** 310:10 315:19  
 320:1 327:19 412:17  
 413:19,20 414:14  
 415:14  
**tomatoes** 116:22  
 124:16 310:19 318:2  
 318:7 404:3 405:17  
 406:11 412:1,3,10,15  
 412:18 414:15 419:13  
 420:17,18 422:12,20  
 423:13 426:20  
**tomorrow** 8:12 103:3  
 216:1 488:3,12  
 501:16  
**ton** 232:13 318:9  
 491:20  
**tonnage** 192:16  
**tons** 483:7 492:22,22  
 492:22  
**tool** 75:18,19 76:21  
 229:7 358:16 359:2  
**tools** 75:11 290:15
- top** 146:14 170:18  
 171:19 218:8 242:10  
 267:19,21 268:21  
 449:11 479:19,22  
 480:7,7  
**topic** 22:1,6 32:8 33:17  
 81:7 84:2 166:4  
 254:14,22 271:19  
 291:9 292:1 387:15  
 477:10  
**topics** 93:18,20,22  
 144:14 157:8  
**topping** 313:18  
**topsoil** 271:1,19,20  
 273:9  
**torn** 306:4 308:8 326:21  
**tortured** 396:9  
**total** 15:8 22:13 178:1  
 264:10 284:7 319:19  
 399:14 465:2 473:3  
 476:6 490:11  
**totality** 221:4  
**totally** 249:14 298:18  
 306:12 328:18 370:13  
 415:12 420:6 486:1  
 488:20  
**touch** 31:16 66:6 155:2  
 337:20 445:17  
**touched** 131:19  
**touches** 131:10  
**touching** 171:22  
**tough** 288:14,14 410:4  
**tour** 483:15  
**toured** 286:7  
**town** 169:19 418:11  
**toxic** 356:22 362:21  
**toxicity** 207:12  
**toxicologist** 268:16  
**trace** 27:3 160:16 164:9  
 198:19  
**trace-back** 79:8  
**traceability** 36:3 160:11  
 164:17 177:13  
**traceback** 165:9 197:21  
 198:22  
**TRACES** 158:11  
**tracing** 160:20  
**track** 25:6 36:10 49:5  
 50:1,9,15,17 54:20  
 55:3 65:13 127:17  
 185:1 186:14 188:19  
 416:10  
**tracked** 54:3  
**tracking** 45:15 49:16  
 55:9 162:4 178:9  
 189:2,12 196:15  
**traction** 126:10  
**trade** 2:14 3:12 25:6  
 41:4 50:1 61:11,14  
 65:3 80:8 105:21,22  
 106:3 109:19 110:12  
 132:5,16 133:6,13,15  
 133:20 140:7,14  
 141:11,15 143:3  
 147:20 154:14 158:4  
 159:16 163:9 171:6  
 183:1 190:6 194:14  
 194:17 195:5 199:4  
 227:16 280:22 281:1  
 421:18  
**trade-related** 140:10  
**traded** 281:8  
**traders** 274:4  
**trading** 50:17  
**traditional** 376:6  
**traffic** 134:14 187:18  
 450:7  
**traffickers** 450:10  
**tragacanth** 219:3  
**trail** 30:8  
**train** 58:15 295:8  
 404:19  
**trained** 72:7 76:8 79:5  
 180:4 294:1 295:4  
**training** 28:21 29:2,3,10  
 29:12 32:7 53:14,15  
 55:20 59:9 78:14,15  
 79:10 180:12 291:22  
 292:15 294:2  
**trainings** 29:5 464:16  
**transaction** 162:1  
 177:15,19,21,22  
**transactions** 160:14  
 161:4,16  
**transcriber** 276:18  
**transcript's** 432:13  
**transcripts** 431:8 432:4  
**transduction** 435:6  
**transfer** 121:9 200:6  
**transferred** 147:8,9  
**transformation** 44:7  
**transition** 13:15 16:18  
 17:5 80:21 83:11,12  
 87:15 94:21 132:12  
 220:6 303:14 430:4  
**transitional** 430:2  
**transitioning** 297:7  
 314:8  
**transitions** 340:7  
**translated** 78:12,19  
 136:4  
**translates** 137:13  
**translation** 142:8  
**transmit** 61:13  
**transmits** 124:16  
**transmitted** 123:1  
 125:9 197:16  
**transparency** 42:3  
 402:16 405:22 406:8  
 459:16  
**transparent** 41:9 53:12  
 168:7 373:7  
**transplant** 258:12,13  
**transplants** 236:6  
 245:6 282:11  
**transport** 452:11  
**transportation** 134:15  
 445:15  
**transposons** 435:7  
**travel** 119:16 205:11  
**traveled** 7:16 274:10  
**traveling** 7:13  
**travesty** 332:11  
**treat** 102:6 195:21  
 202:19,20 364:9,9  
 469:1,2  
**treated** 47:16 48:18  
 49:1,1 50:4 181:20  
 202:4 296:19  
**treating** 474:5 501:15  
**treatment** 149:18 151:7  
 151:9 152:17,18  
 180:19 202:11 203:1  
 203:3,7 421:9  
**treatments** 151:9,13,14  
 151:15  
**trees** 449:12  
**tremendous** 6:9 19:5  
 26:6 115:10 198:16  
 223:8  
**tremendously** 40:12  
**trend** 24:9 352:19,22  
**trends** 36:10 181:21  
 182:10 460:6  
**trial** 418:12  
**trials** 264:16 386:1,2  
**trick** 73:7 102:6 187:17  
 459:21 474:5 501:15  
**tried** 442:5  
**tries** 336:20  
**trigger** 192:17  
**trimmings** 485:10  
**trio** 212:9  
**trip** 330:11,16,22 365:2  
**triple** 265:13  
**tripled** 188:16  
**trophic** 482:8,10,16,18  
**trophy** 222:3  
**trouble** 328:20 351:14  
**troubling** 417:16  
**trout** 77:20  
**trowel** 367:10  
**truck** 425:17 426:14  
**trucking** 426:11

**trucks** 232:1,2  
**true** 5:22 98:8,16  
 323:11,15 352:10  
 357:7 374:8 394:4  
 395:21 462:8 465:15  
 500:15  
**truly** 15:10 23:15 35:9  
 45:20 156:16 164:9  
 269:9 279:13 294:18  
**trust** 376:19 410:11,17  
 411:1,7 461:13  
**trustee** 251:13 254:12  
**Trustees** 9:14  
**trusting** 276:11  
**truths** 336:10  
**try** 55:1 91:20 92:2  
 128:17 131:14 135:14  
 140:20 143:9 168:3  
 191:3,21 225:11  
 308:21 326:19 339:22  
 348:9 352:18 382:16  
 403:8 440:10 457:13  
 492:20 493:7  
**trying** 67:16 68:19  
 112:15 119:8 121:1  
 169:11 178:20 185:4  
 186:21 188:18 189:9  
 189:11 194:16 243:6  
 261:11 265:1 272:9  
 277:13 278:7 288:21  
 299:9 319:12 328:20  
 331:13,22 332:5  
 352:5 359:16 366:8  
 372:9 383:13 470:14  
 470:17 489:14 496:17  
**tub** 326:8  
**tube** 377:6  
**Tucker** 2:6 5:3,8 6:5,14  
 6:20 7:8 12:22 13:5  
 14:20 19:4 61:7 62:17  
 64:4 66:18 67:2 68:6  
 69:3,6,9 70:10 71:10  
 74:7 75:7 76:16 78:4  
 78:21 80:20 81:22  
 82:9 83:9 84:11 85:13  
 85:22 86:4 87:6,19  
 90:9 91:10,13 104:9  
 107:1 109:13 151:19  
 155:6,16 156:5,7  
 169:11 172:7 173:8  
 173:17 175:9 178:5  
 181:8 196:6 197:13  
 199:10 201:4 221:12  
 221:14  
**TUESDAY** 1:7  
**tunnels** 482:20  
**Turkey** 104:7 189:14  
**turn** 13:17 16:13 19:12

26:3 33:17 39:21  
 48:11 107:7 143:21  
 149:7 155:6 156:4  
 158:9 162:12 166:7  
 221:11 287:2 314:11  
 345:21 362:19 394:1  
 460:2 473:7 479:16  
 480:20  
**turned** 239:17 286:11  
 315:18 355:16 497:2  
**turning** 50:7 460:10  
**turns** 72:4  
**tweaking** 140:3  
**tweaks** 63:20  
**twenty** 110:13  
**twice** 309:17 391:1  
**two** 9:9 15:2,7 20:2  
 22:15 23:10 37:15  
 41:10 47:20 48:8  
 50:13,22 54:11,11,12  
 56:4,10 60:6 70:5  
 72:1 78:7 98:11  
 114:21 115:13,16  
 123:15 152:6 153:8  
 169:15 180:14 186:4  
 187:1 194:12 198:10  
 201:14 210:14 211:7  
 213:5,21 214:16  
 219:15 221:3,9 243:1  
 246:6,14 247:16  
 274:10 279:3 289:8  
 296:18 305:13 310:5  
 316:21 320:8 355:16  
 360:16 380:12 390:13  
 409:21 413:13 440:6  
 440:15 450:11 455:19  
 460:7 484:4 493:2  
**two-** 11:19  
**two-thirds** 215:6,7  
 216:22 364:4 391:8  
**type** 88:11 160:18  
 201:6 212:10 230:1,2  
 248:8 370:16 446:2  
**types** 36:5 123:16  
 128:2 252:11 254:3  
 386:6 404:7 454:7  
 474:22 480:10  
**typical** 186:19 187:1  
 231:20 322:15  
**typically** 118:9 205:2  
 214:20 228:18 231:17  
 248:20 405:8

---

**U**

---

**U** 3:5,10 264:9 268:9  
**U.S** 2:14 28:9 30:3,11  
 31:20 38:14 41:8,11  
 41:13 42:6 43:4,8,11

44:16 45:4,15 46:13  
 46:16 49:5 69:16  
 106:1,14 114:8  
 134:17 138:10,17,22  
 145:13 148:1,20  
 158:2,7 181:21  
 198:10 201:21 239:5  
 280:8,10,19 282:20  
 288:2,6,9 313:18  
 376:11 438:17  
**UC** 9:13  
**Ugo** 347:3  
**ultimately** 87:2 119:20  
 120:17 123:3 150:19  
 152:16 182:19 366:9  
**Um-hum** 84:18 91:15  
**umbrella** 274:3  
**un-inspectable** 364:16  
**unanimously** 356:4  
**unannounced** 74:20  
 75:10,13,15,17 76:16  
 76:20 402:21  
**unapproved** 346:13  
**unaware** 202:15  
**uncertified** 24:6,10,12  
 24:15 291:15  
**unclear** 253:13 398:10  
 398:12  
**uncomfortable** 454:10  
**undefined** 254:1  
**undercover** 391:8,9,11  
**underestimate** 274:12  
**undergoes** 44:7  
**undergoing** 210:4  
**underline** 169:7  
**undermine** 270:8  
**underneath** 244:13  
 270:13 306:20 465:17  
 481:13  
**undersecretary** 15:17  
 15:22 16:3,15,19 17:4  
 95:4 145:1 169:18  
**understand** 36:6 42:13  
 67:11 102:17 111:13  
 157:1 178:17 184:9  
 185:4 186:21 197:3  
 199:12 200:11 234:15  
 238:4 269:14 270:11  
 272:5 294:1 303:18  
 349:15 362:10 372:9  
 375:16 391:3 393:4  
 394:5 399:6 409:1  
 456:11 460:14 468:11  
 476:9  
**understanding** 44:10  
 45:7 68:4 83:3 144:2  
 159:22 204:1 237:3  
 254:2 371:7 397:11

422:19  
**understands** 152:1  
 247:9 249:13 462:12  
**understood** 84:22  
 255:1,5 453:13  
**undertake** 133:5  
**undertakes** 133:20  
**undertaking** 179:15  
**underway** 17:14 70:16  
 84:13 193:7  
**undoubtedly** 195:1  
**unethical** 356:8  
**unfair** 98:13 249:10  
 257:12 429:18  
**unfairly** 128:20  
**unfavorable** 477:1  
**UNFI** 3:6 251:10,11  
 253:1  
**unfold** 160:3  
**unfortunately** 94:22  
 460:1  
**uniform** 421:16 440:16  
**unintended** 321:18  
**unintentional** 187:6  
**Union** 3:9 42:21 275:3  
 279:3 280:21 281:18  
 361:11 389:11 437:18  
 437:19  
**unique** 136:4,6 165:22  
 427:13  
**unit** 391:14  
**United** 1:1 29:19 43:2  
 43:18,20 117:2,9,12  
 117:21 118:5,21  
 129:15 131:22 146:13  
 146:21 149:5,7,14  
 151:13 152:14 185:7  
 187:18 193:4 256:19  
 322:19 323:3 393:4  
**uniting** 274:4  
**universe** 160:1 194:9  
**university** 90:5 106:16  
 386:3 472:18 473:18  
 473:21  
**unlabeled** 402:21  
**unmistakable** 499:20  
**unpack** 404:8  
**unpaid** 96:21  
**unstable** 486:1  
**unsure** 99:10  
**unusually** 412:12  
**up-and-coming** 462:5  
**up-pot** 455:2  
**UPC** 253:4  
**upcoming** 160:8 217:9  
 219:13  
**update** 4:9 7:9 8:4,9  
 12:19 13:10,16,19,20

14:3 21:18,18 49:7  
 50:20 58:10 59:22  
 81:17 157:13 159:1  
 206:13 209:3,4 217:4  
 219:9,10 275:3  
 295:18  
**Update/** 4:15  
**updates** 213:21 214:2  
 217:7 369:15  
**updating** 55:20 369:17  
**upfront** 475:12 478:14  
**upper** 282:14  
**ups** 56:14 194:15  
**uptake** 472:8 475:22  
 477:5 500:8  
**urban** 390:18 406:5  
 455:9  
**urea** 494:20  
**ureas** 494:9  
**urge** 77:10 78:1 252:4  
 253:20 259:10 297:4  
 390:5,14 391:21  
 429:19 435:19 436:5  
 439:19 477:8  
**urging** 439:22  
**Uruguay** 438:6  
**Urvashi** 3:10 264:2  
 268:5,6,9  
**USA** 330:14  
**usage** 209:1 358:22  
 439:12 442:20 443:1  
 490:18  
**USAJOBS** 88:10,11,13  
**USDA** 4:6 15:14 16:16  
 32:12 38:5 42:7 47:7  
 85:8 93:11 95:13  
 99:13 107:2 113:10  
 113:11,20 114:6  
 131:17 144:11,19  
 145:17 147:9 163:3  
 181:5 202:13 222:4  
 239:8,17,19 244:2,12  
 271:4 297:16 306:19  
 307:1,20 308:15  
 309:3 355:22 357:13  
 362:14 366:4,20  
 386:2 394:12,12  
 406:5,20 434:21  
 459:12 460:11 462:10  
 464:16  
**USDA's** 20:2 105:8,13  
 106:7  
**useful** 42:14 81:8 331:9  
 439:3,4  
**user** 34:19 113:22  
 115:3 131:20,21  
 147:13  
**users** 115:14,16,17

116:4  
**uses** 128:1 132:17  
 228:3 370:8 372:7  
**usual** 59:21  
**usually** 89:11 202:14  
 481:4 486:11  
**uterus** 397:15  
**utilization** 114:10  
**utilizing** 290:14  
**UVM** 419:1

---

**V**


---

**vacancy** 89:15  
**vacant** 70:14  
**vacation** 408:2  
**Valentine's** 153:8  
**valid** 45:3,19 46:12  
 161:9,16  
**validates** 46:19  
**validation** 154:12  
**Vallaey's** 3:13 427:6  
 433:10,11 436:15,20  
 437:16,21 438:7  
 439:21 440:3,6,8  
 441:3,5  
**valuable** 250:9  
**value** 96:7 229:21  
 248:21 271:3 279:7  
 364:8 408:5,5 421:11  
**valued** 188:12,15  
 315:16  
**values** 352:7 353:13  
 403:3 408:22  
**Van** 256:10  
**vanguard** 403:14  
**variety** 17:18 131:19  
 132:1 139:13 143:18  
 301:13 483:16  
**various** 93:5 106:2  
 130:10 133:6 134:4,6  
 134:12,22 136:8  
 137:7 138:15,16,17  
 139:5 140:10 141:1  
 142:11 143:16 148:1  
 167:15 170:17 171:4  
 219:6,20 252:13  
 365:11 390:9 451:10  
 487:13  
**varroa** 211:20  
**vary** 496:6  
**varying** 138:6  
**vast** 22:21 242:22  
 321:11 421:22 442:14  
 489:4  
**Vedic** 453:6  
**vegetable** 9:18 10:14  
 152:4 154:20 190:8  
 264:9 301:4 313:18

314:19 321:2 330:6,9  
 354:17  
**vegetables** 105:17  
 154:1 181:18 235:13  
 245:8 246:9,13  
 301:14 313:19 362:16  
 404:22 414:5 417:2,7  
 449:22 458:13 473:2  
**vegetation** 296:15,17  
**vegetative** 475:19  
**vehicle** 134:12,16  
 361:12  
**vendors** 379:2 402:9  
**verbal** 209:4 213:21  
 214:2  
**verification** 44:14 46:19  
 154:13 254:5 372:14  
**verified** 41:11 299:2  
 406:6,20  
**verify** 43:3 104:17  
**verifying** 38:10  
**vermicompost** 497:12  
 497:19  
**Vermont** 2:21 241:17  
 242:6 247:7 322:7  
 324:20,21 325:3  
 348:2,15,15 352:14  
 409:11 412:8 416:18  
 420:14,16 449:5,5,6  
**versa** 86:10  
**versed** 175:19 177:6  
**version** 44:3 57:1  
 187:10  
**versions** 56:19  
**versus** 131:20 261:6  
 305:15 387:7 414:6  
 424:21 439:3 466:7  
 479:13 480:10  
**vessel** 180:8  
**veterinary** 146:8  
**viability** 390:16  
**viable** 278:4 490:7  
**vice** 1:12 10:17 11:11  
 11:12 86:10 378:1  
**VICE-CHAIR** 337:14  
 338:1,3,5,21 358:3,9  
**vicinity** 395:8  
**view** 93:2 94:13,14  
 97:10 236:9 237:16  
 276:8 304:8 306:18  
 307:6,10 309:13  
 318:21 344:1 351:3  
 352:1,8,18 353:1  
 370:8 398:16 408:17  
 408:18 482:10  
**views** 21:1 29:5 247:2  
 305:10 348:10 353:4  
**vigorous** 460:13

**vigorously** 359:14  
**violate** 410:17 411:7  
**violations** 187:5  
**Virginia** 256:7 261:2,3  
**virtually** 230:20 315:8  
**visibility** 121:16,19  
 124:3 127:8 142:4  
 185:6 193:5  
**vision** 433:19  
**visited** 483:14  
**visually** 188:2  
**vital** 36:9 52:17 59:1  
 205:10  
**vitality** 377:7  
**vitamin** 293:8 400:1  
**vividly** 283:11  
**voice** 140:16  
**voiced** 359:18  
**volume** 131:5 187:17  
 188:10 192:16 311:4  
 413:3 454:7 457:2  
**voluntarily** 391:16  
**voluntary** 100:5 141:14  
 299:17  
**volunteer** 364:22  
**volunteers** 14:10  
**vote** 214:2 215:3  
 305:22 320:18 396:2  
 421:3 427:14,18  
 441:19 444:15  
**voted** 213:19 214:15  
 356:3 359:11 397:1  
**votes** 214:16 215:11,14  
 434:1  
**voting** 99:8 209:4  
**VS** 153:15  
**vulnerabilities** 188:22

---

**W**


---

**wait** 127:2 293:11  
 437:16 471:4,4,4  
**waiting** 321:3 474:13  
**walk** 57:21 102:18,19  
 109:15  
**walking** 76:6 255:16  
**wanted** 7:4 18:12 19:19  
 78:9 86:2 102:11  
 120:18 131:10 153:3  
 175:5 193:11 263:7  
 269:2,12 283:14  
 294:4 337:8 355:17  
 373:10 396:14 398:2  
 399:22 400:7 405:14  
 483:10  
**wanting** 82:12 129:5  
 399:6  
**wants** 38:13 126:5  
 169:1 249:12 410:9

- War** 417:5  
**warehouse** 162:4  
**warm** 491:7  
**warming** 304:5  
**warned** 101:8 369:21  
450:18 453:5,8  
**warning** 225:5  
**warrant** 209:17  
**warranted** 433:22  
**Washington** 11:5 74:10  
77:1 200:18 329:1  
**wasn't** 64:2 126:10  
128:15 136:14 193:9  
210:22 220:8 255:4  
263:16 286:12,13  
367:18 409:20 431:18  
449:16 464:4,7  
**waste** 258:2 261:20  
466:19  
**watched** 409:19  
**watching** 326:5 451:3  
**water** 1:9 77:17 149:19  
219:2 257:18 258:13  
258:14,16 259:2,19  
260:3 264:21 265:2,6  
265:6 266:19 267:14  
267:15,21 268:1  
284:8,14 295:20  
300:17 302:9 310:20  
311:6 341:2 348:22  
349:11 375:13 384:5  
389:12 411:5 444:7  
464:16 465:4,18  
466:2 467:11,16  
471:21 476:17 479:4  
479:7 481:2,3,11,11  
481:16 489:19,21  
490:13  
**water-based** 266:20  
**watered** 272:15  
**watering** 242:9 422:5  
**watershed** 258:5,6  
449:11  
**wave** 175:17  
**way** 5:13 14:22 64:6  
65:6,7 66:22 77:3  
83:14 85:12 90:10  
119:14 121:20 124:7  
136:13 137:15 144:8  
146:11,16 147:12  
161:14,20 175:11  
178:3,21 184:17  
185:16 188:2 189:4  
190:15 197:9 200:6  
203:17,21 232:3  
242:14,18 243:6  
253:2 256:22 264:16  
269:8 273:13 274:22  
276:11 285:20 296:13  
299:18 300:17 309:9  
318:13 320:6 337:4  
337:11 340:8 347:11  
350:2 352:8 353:3  
383:22 385:9 392:20  
423:16 425:9 442:10  
443:15 447:6 460:18  
463:16 467:3 479:16  
480:5,6,16 482:18  
485:2 490:9,11  
**ways** 31:21 68:12 72:1  
131:19 138:17 162:16  
164:12 165:2 186:20  
187:1 247:20 249:8  
250:17 305:22 319:16  
353:16 407:5 433:18  
438:19 443:5 444:10  
470:7  
**weak** 191:11  
**weaknesses** 191:4  
**wearing** 190:21  
**weather** 249:4 261:10  
**weathered** 230:17  
**weave** 198:15  
**web** 25:21 465:14,19,20  
**webinar** 15:8 255:2  
263:8  
**webinars** 15:7 29:1  
53:15  
**website** 25:3,15 37:12  
38:5 60:16 88:10  
90:11 143:12 144:20  
152:4 156:1 209:11  
209:21,22 211:14  
212:2,18 214:7  
218:10 295:22 327:8  
373:5  
**weed** 417:13  
**weeds** 116:15 120:2  
259:1 300:5 417:19  
418:15 484:20 485:11  
**week** 14:13 22:12 29:13  
127:9,10 266:2 306:4  
320:8 348:12 404:22  
404:22,22 412:12  
**week-a-year** 408:21  
**weekend** 469:20  
**weekly** 121:9 420:18  
**weeks** 127:15 364:7  
**weighty** 92:14  
**welcome** 5:5 7:13 14:7  
15:13 17:9 18:5 30:17  
96:10 100:4 268:4  
293:2,20 406:15  
443:22 451:12  
**welcomes** 13:14 17:8  
**welfare** 10:15 145:15  
408:8  
**well-constructed**  
319:21  
**well-defined** 336:13  
**well-respected** 327:18  
**well-written** 325:22  
**went** 103:12 122:5  
143:9,10 206:8  
329:15 334:17 355:7  
357:16 359:19 362:17  
426:8 464:5,9,15  
483:15 501:21  
**weren't** 222:12 322:18  
400:1 431:14  
**west** 321:2  
**Westminster** 409:11  
416:18 420:14  
**Westport** 458:11  
**westward** 148:10  
**wet** 310:14  
**wettable** 234:1,3  
**wheat** 189:7 423:5,6  
**whew** 356:3  
**whitefly** 318:4,6  
**whole-heartedly**  
293:19  
**wholesale** 458:14  
**wholesalers** 291:15  
**Wholesum** 2:16 235:12  
**wide** 108:9 132:1  
143:18 242:16 298:1  
298:21 299:12  
**widely** 421:5  
**wife** 392:8  
**wiggle** 176:5,9  
**wild** 2:9 254:1 295:13  
297:20 298:9 461:10  
**wildlife** 138:11 145:15  
146:3,8 295:21  
**willing** 394:1 459:4  
**willingness** 35:7  
**wind** 2:13 300:17  
308:22 417:16  
**winded** 392:14  
**window** 89:3 115:19  
122:9 124:17  
**Wingerden** 256:10  
**Winona** 427:10  
**winter** 29:12 32:6  
406:13  
**wintertime** 405:17  
**Wisconsin** 11:14 386:3  
**wisdom** 341:11  
**Wise** 337:1  
**wish** 100:2,7 196:18  
226:21 278:11 372:7  
**withhold** 320:6  
**witness** 57:15 164:3  
418:10  
**woman** 484:10  
**women** 353:6 411:8  
**won** 221:16 287:1  
415:19  
**wondered** 319:1  
**wonderful** 19:6,6 223:7  
286:7 316:22 394:13  
**wondering** 60:15 61:1,3  
61:21 62:8,14 63:16  
70:7 71:7 79:21  
178:19 192:14 247:1  
297:22 326:5 335:3  
352:17 387:5 461:19  
**Wood** 2:21 363:18  
**woods** 261:12  
**word** 174:4 182:10  
183:9 197:12 269:20  
286:4 290:20 327:8  
327:11 332:13,14  
382:18,21 383:14  
429:22  
**wording** 296:21  
**words** 85:10,15 98:1  
112:11 122:8 171:14  
176:5,11 223:6  
275:16  
**worked** 5:20 38:20  
64:16 82:15 101:15  
106:14 109:20 132:22  
141:11,14 154:8  
181:6 187:13 313:13  
318:16 319:5 338:11  
349:18 421:10 422:5  
453:9 465:9 470:14  
488:14  
**workgroups** 168:4  
**working** 27:16 30:13  
31:18,19 39:17 51:13  
52:19 66:3 93:3 95:5  
95:20 99:12 110:19  
113:15 119:12 130:12  
133:12 135:5 136:20  
138:9 141:16 142:20  
143:3 153:14 154:9  
157:1,21 158:12,21  
160:5 170:1 173:19  
176:15 179:17,21  
180:22 182:7 193:17  
203:17 240:6 245:20  
266:21 290:12 291:13  
292:5 296:3 365:6,9  
369:7,14 399:17  
411:14 423:17 457:8  
499:16  
**workload** 217:18  
**works** 28:15 86:18  
87:21 90:11,13 124:7

175:12 198:17 200:7  
222:13 372:10 384:7  
**world** 42:4 59:16 118:1  
244:16 269:12,15  
296:9 298:12 310:13  
337:6 353:5 384:3  
393:5 417:5 433:16  
491:15  
**worldwide** 26:14  
**worms** 417:18  
**worrying** 193:10  
**worse** 411:20 460:9  
**worst** 481:9  
**worth** 177:20 433:21  
**wouldn't** 172:21 179:4  
204:10,22 333:22  
359:14 406:20 484:1  
485:13 491:16 493:19  
**wrap** 188:18 201:14  
225:11 453:16  
**wrapping** 220:21  
**wreck** 404:19  
**write** 147:2 276:19  
383:10  
**writers** 440:13  
**writing** 91:21  
**written** 15:2,5 81:13  
101:20 174:5 253:15  
367:2 368:7 398:3,16  
438:15  
**wrong** 113:2 119:7  
143:10 196:4 342:13  
362:1 407:11 449:13  
**wrongly** 315:11  
**wrote** 34:9 337:21  
**WSDA** 11:4

---

**X**


---

**X** 384:15  
**xanthan** 219:4

---

**Y**


---

**Y** 384:15  
**year** 6:16 9:12,19 10:1  
10:5,9,19,22 11:7,16  
21:20 22:10 23:2 24:4  
24:9 25:2 29:10 34:11  
39:12 48:20 52:19  
57:14 63:15 64:8,9  
71:6 73:21 75:16  
118:4 122:15 133:2  
137:5 153:1,2 173:22  
175:22 194:12 197:18  
217:13,15 291:21  
303:4 319:15,16  
343:20 362:18 377:21  
397:13 404:16 408:1  
413:13 421:2 423:1

432:18 436:16,18  
452:16 476:6 485:20  
488:7

**year's** 218:1  
**year-old** 241:22  
**year-round** 118:21  
261:14 313:20 412:9  
**yearly** 152:22  
**years** 5:21 7:1 9:9 13:7  
17:15 23:4 26:7 35:2  
50:13 51:1 54:12,12  
56:4,5,10 82:15 84:1  
92:18 110:13 126:7,8  
126:11,12 133:1  
150:3 154:1 169:15  
188:11 189:7 193:12  
194:13 210:11 228:2  
228:11 243:9 244:6  
246:14 247:16 256:11  
264:14 265:12 268:11  
268:15 276:6 283:10  
297:2,13 299:4 301:8  
309:18 314:1,13  
315:17 316:21 317:4  
317:7 319:5 321:10  
323:9 329:2 330:10  
339:7 340:7 346:19  
355:14 363:22 364:21  
365:1,3 366:6 376:4  
390:1 394:16 401:13  
402:18 410:4,11  
413:13 414:14 416:22  
417:8 418:13 419:2,3  
420:21 430:17 439:22  
449:10 450:3,15,15  
453:2,4 458:16  
470:18 488:17 497:1  
497:6

**yellow** 225:3,4  
**yesterday** 15:21 16:5  
16:20 18:1 169:19  
305:20 334:12 335:15  
**yields** 249:8 314:21  
**York** 106:16 413:16  
**young** 102:11 323:14  
325:6 337:10 350:18  
350:21 351:13,19  
352:16 353:1,11  
354:8 418:2 462:4  
475:18

**younger** 353:3 459:14  
**youth** 461:12  
**YouTube** 29:4

---

**Z**


---

**Zealand** 406:12  
**zinc** 21:12 210:7  
**zone** 237:6 477:1 478:4

486:11,17 500:8  
501:5

---

**0**


---

**0.1** 231:21

---

**1**


---

**1-2** 490:6  
**1,000** 472:10  
**1,200** 128:9  
**1,300** 290:4 396:13  
**1,700** 274:18 277:22  
278:12 280:17  
**1.65** 188:17  
**1.7** 393:10  
**1:30** 206:4  
**10** 74:13 113:5 128:7  
193:8 194:22 215:11  
215:14,14 297:2  
311:3 323:3 343:9  
417:7 418:13 419:3  
439:14  
**10-10-10** 417:12  
**10,000** 243:9 278:8  
**10:09** 103:12  
**10:30** 103:10  
**10:40** 103:13  
**100** 177:16 185:6,10,12  
192:13,18,19,22  
193:2 194:22 195:13  
241:17 297:13 320:2  
320:9 388:3,9 397:5  
397:22 399:12,15  
401:2 416:22 445:9  
484:21 485:15 487:18  
**100-150** 175:22  
**1020** 54:3,18  
**103** 4:13  
**1031** 52:14  
**11** 147:4  
**11:00** 102:7  
**12** 4:5,6 264:14 283:10  
343:9 404:15  
**12:30** 192:4  
**12:50** 206:8  
**13** 96:1  
**13,000** 275:9  
**14** 114:14 117:6 118:5  
118:15,18 122:14  
127:3 193:1 204:6  
215:13  
**142** 401:14  
**15** 14:9 113:5 194:22  
215:10 227:9 266:6  
266:10 419:3  
**15,000** 73:22 177:17,20  
**150** 177:17  
**16-0-0** 311:19

**165** 15:8  
**17** 22:10 114:7 268:10  
283:8 377:18 379:20  
381:7  
**17011** 53:6 54:13 56:11  
**186** 389:7  
**187,500** 24:4  
**18th** 322:15  
**19** 401:14  
**1900s** 231:16  
**1917** 416:22  
**1930s** 341:12  
**1937** 116:17  
**1950** 362:14 417:3  
**1960** 283:7  
**1965** 417:7  
**1971** 409:14  
**1972** 330:10  
**1974** 417:15  
**1977** 393:10  
**1989** 420:16 458:17  
**1993** 110:6  
**1997** 392:12  
**1999** 362:15

---

**2**


---

**2** 343:10 453:2  
**2,000** 395:8  
**2,300** 147:8  
**2.5** 445:8 497:6  
**2:00** 102:7 206:4,5  
**2:10** 206:9  
**20** 228:1 235:21 236:15  
257:7 259:5 274:10  
314:1 319:19 320:11  
323:3 340:7 346:19  
380:5 439:14 443:2  
465:1  
**20,000** 118:12 395:11  
**200** 241:18  
**200,000** 177:22  
**2000** 21:10 57:19  
145:21  
**2000s** 137:3 316:16  
**2001** 145:22 147:4  
429:5 430:11,18  
**2002** 430:16 432:14,15  
432:16  
**2003** 147:6 432:19  
**2004** 432:14  
**2005** 40:15 57:19  
430:11 432:14  
**2006** 429:6 430:16,18  
432:14  
**2007** 150:1  
**2010** 40:15 51:15 82:16  
237:17 309:19 313:13  
318:17,22 383:10

388:5,6,12  
**2011** 188:13,15  
**2012** 40:16,19 133:10  
**2013** 34:10 40:19 64:20  
**2014** 34:4 52:14 133:9  
 214:9  
**2015** 34:6 369:8 434:7  
 435:11  
**2016** 21:10 37:8 122:4  
 133:2 141:1 170:16  
 188:13,17 216:12  
 291:13 434:20  
**2017** 1:5,7 5:6 12:8  
 13:17 14:4 19:13,14  
 22:16 24:21 34:8 40:3  
 52:8 128:10 216:17  
 217:8 223:1 235:19  
**2018** 34:5 51:9 59:1  
 63:14 64:2,3,5,13  
 217:11 218:4 254:15  
**2019** 215:18,18 216:4,8  
 217:21  
**2020** 217:11,16 218:12  
 218:18  
**2030** 275:7  
**205** 57:1  
**205-602** 371:3  
**205.101** 290:21 291:2  
**205.303** 291:6,12,20  
 292:4,9 294:15,21  
**205.307** 291:7,10,18  
 292:4,6,8 294:11,19  
**205.601(j)(6)** 428:13  
**205.606** 213:1,4  
**2050** 343:21  
**205601** 211:3  
**206** 4:16  
**224** 4:18  
**24** 124:2 374:20  
**24/7** 148:5  
**245** 1:9  
**25** 251:6 316:17 365:1,3  
**25-fold** 189:7  
**250** 395:5  
**250,000** 118:4  
**26** 30:17 313:20  
**29** 235:19

---

**3**

**3** 126:13 369:12 463:11  
 499:11  
**3-** 407:20  
**3-fold** 189:5  
**3-week** 407:21  
**3,000** 395:7  
**30** 121:5 125:2 232:13  
 256:8 286:18 301:1,7  
 340:7 418:17 420:21

458:16  
**30-cow** 449:18  
**30-day** 123:13  
**30,000** 77:10 118:12  
**300** 298:5 365:2 418:17  
**300-acre** 416:17  
**31** 1:7  
**311** 24:19  
**319.56-4** 150:11  
**34** 216:14  
**35** 207:3 215:15 227:17  
 232:9  
**350-some** 408:13  
**350,000** 118:4  
**36** 18:9  
**37** 4:7 153:17  
**379** 23:2  
**38,000** 314:8  
**39,035** 22:13

---

**4**

**4** 165:5 369:12 398:11  
 498:17  
**4-month** 407:20  
**4,000** 395:7  
**4.2** 189:8  
**4.4-fold** 189:8  
**4.5** 498:21  
**4.9** 473:2  
**4:22** 329:9,15  
**4:30** 329:10  
**4:31** 329:16  
**40** 125:2 256:11 261:18  
 280:18 363:14,22  
 364:21 380:15 418:17  
 439:14 450:14,15  
 489:21  
**40-plus** 410:11  
**412** 188:12  
**42** 401:13  
**45** 330:10  
**450** 92:9  
**453** 33:22  
**46** 217:16  
**462** 23:18  
**47** 110:15 111:5,19  
 112:16 123:21 133:5  
 157:2 167:3,21 473:4  
**48th** 377:21

---

**5**

**5** 4:2 128:7,7 193:8  
 194:21 393:11 437:10  
 439:12 498:17,17  
**5,000** 127:9 363:8  
**5.5** 498:21  
**50** 136:20 146:3 190:11  
 232:13 236:1 237:18

238:14,19 250:19  
 257:9 263:10 266:8  
 275:8 299:4 362:18  
 439:14 450:15 472:10  
 475:11  
**50,000** 152:22  
**500** 127:9 313:19 326:8  
 399:14,15  
**501** 4:20  
**5031** 295:6  
**50s** 401:16  
**52** 4:9 217:13  
**52-** 408:20  
**523** 202:13,13  
**548** 188:13  
**56** 153:22 363:22  
**5611** 217:6  
**59** 4:11

---

**6**

**6** 439:14  
**6-** 449:15  
**6-year** 497:3  
**6:00** 416:9  
**6:15** 416:12  
**60** 57:13 261:20  
**600** 188:15 450:4  
**602** 370:2 371:16  
**604** 371:19  
**605** 368:12  
**606** 219:2 368:12  
**60s** 401:16  
**62** 401:13  
**6513(b)(1)** 428:1  
**6513(g)** 428:4  
**68** 449:7

---

**7**

**7** 4:3 57:1 146:1 343:10  
**7:00** 416:10  
**7:20** 501:15  
**7:22** 501:21  
**70** 434:21  
**70,000** 374:19  
**70s** 401:16  
**72** 92:11  
**75** 24:9 70:21  
**776** 473:11  
**79** 434:9

---

**8**

**8** 4:4 449:9  
**8-cow** 449:15  
**8(e)** 116:14 128:13  
**8:30** 1:9 501:17  
**8:35** 5:2  
**80** 395:5  
**82** 435:12

**86** 434:11  
**86,269** 374:17  
**89** 390:7

---

**9**

**9** 146:2 343:20 449:9  
**90** 282:3  
**90,000** 153:1  
**93** 15:9  
**95** 282:3 312:20  
**99** 231:18 261:21 297:8  
**99.9** 231:20

C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Fall 2017 Meeting

Before: USDA/NOSB

Date: 10-31-17

Place: Jacksonville, FL

was duly recorded and accurately transcribed under  
my direction; further, that said transcript is a  
true and accurate record of the proceedings.



-----  
Court Reporter

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

## UNITED STATES DEPARTMENT OF AGRICULTURE

+ + + + +

## NATIONAL ORGANIC STANDARDS BOARD

+ + + + +

FALL 2017 MEETING

+ + + + +

WEDNESDAY,  
NOVEMBER 1, 2017

The Board met in Florida Ballrooms A, B & C of the Omni Jacksonville Hotel, 245 Water Street, Jacksonville, Florida at 8:30 a.m., Tom Chapman, Chairman, presiding.

## PRESENT

TOM CHAPMAN, Chair  
ASHLEY SWAFFAR, Vice Chair  
JESSE BUIE, Secretary  
SUE BAIRD  
HARRIET BEHAR  
ASA BRADMAN  
A-DAE BRIONES  
LISA DE LIMA  
STEVE ELA  
DAVE MORTENSEN  
JOELLE MOSSO  
EMILY OAKLEY  
SCOTT RICE  
DAN SEITZ

FRANCIS THICKE

## STAFF PRESENT

MICHELLE ARSENAULT, NOSB Advisory Board  
Specialist, National Organic Program  
DR. LISA BRINES, Ph.D., National List Manager,  
National Organic Program  
DR. PAUL LEWIS, Ph.D., Director, Standards  
Division, National Organic Program  
DEVON PATTILLO, Materials Specialist, National  
Organic Program  
DR. JENNIFER TUCKER, Ph.D., Associate Deputy  
Administrator, National Organic Program;  
Designated Federal Official

## ALSO PRESENT

ISAURA ANDALUZ, Cuatro Puertas  
ANJA ANDERSON, International Pectin Producers  
Association  
JOHN ASHBY, California Natural Products  
CHRISTIE BADGER, National Organic Coalition  
COLEHOUR BANDERA, Kanalani Ohana Farm  
JULIA BARTON, OEFFA  
DAN BENSONOFF, NOFA/Mass  
JOHN BIERNBAUM, Michigan Organic Food and Farm  
Alliance; Michigan State University  
JOHN BOBBE, OFARM  
JEFF BOGUSZ, Ferrara Candy Company  
LYNN COODY, Organic Produce Wholesale Coalition  
JENNY CRUSE, Accredited Certifiers Association  
MARIANNE CUFONE, Recirculating Farms Coalition  
KELLY DAMEWOOD, CCOF  
KAY FELDMAN, Beyond Pesticides  
LEE FRANKEL, Coalition for Sustainable Organics  
MAX GOLDBERG, Organic Insider; Living Maxwell  
TOM HARDING, Green Ag Supply  
CAMERON HARSH, Center for Food Safety  
DAVID HILTZ, Acadian Seaplants Limited  
KIKI HUBBARD, Organic Seed Alliance  
ANDY HUDSON, Westbridge Agricultural Products  
LAUREN JOHNSON, Organic Seed Alliance  
WANDA JURLINA, CP Kelco  
KEITH KANDT, NatureSweet  
MARNI KARLIN, Karlin Strategic Consulting;  
Nature Ripe Farms

## ALSO PRESENT

PAT KERRIGAN, Organic Consumers Association  
LORI KLOPF, ICL Food Specialties  
JESSICA KNUTZON, CP Kelco  
ANDREAS KUENKEL, BASF  
PHIL LAROCCA, LaRocca Vineyards; CCOF  
NATHANIEL LEWIS, Organic Trade Association  
EMILY LYONS, International Dairy Foods  
Association  
MELINDA MAYFIELD, Innovacyn  
SUZANNE McMILLAN, ASPCA  
MARTY MESH, Florida Organic Growers; Quality  
Certification Services  
RON MITCHELL, Local Greens Farm  
TRACY NAZZARO, Traders Hill Farm  
MARISOL OVIETO, Northwest Horticultural Council  
CHRISTOPHER PIERCE, Heritage Poultry Management  
Services, Inc.  
ROBERT RANKIN, IFAC  
GERALD ROBERTSON, Reiter Affiliated  
TERRY SHISTAR, Beyond Pesticides  
JESSICA WALDEN, QAI  
STEPHEN WALKER, MOSA Certified Organic  
JULIE WEISMAN, Elan Incorporated; Flavorganics  
LLC  
DAVID WILL, Chino Valley Ranchers  
  
GWENDOLYN WYARD, Organic Trade Association  
  
ABBY YOUNGBLOOD, National Organic Coalition

## CONTENTS

Public Comment Period. . . . .	4
Compliance, Accreditation, & Certification Subcommittee	
Proposal:	
Eliminating the incentive to convert native ecosystems to organic crop production. . . . .	255
Excluded operations in the supply chain (uncertified handlers) . . . . .	255
Crops Subcommittee	
Topics:	
2019 Sunset Substances - review	
Chlorine materials (calcium hypochlorite, chlorine dioxide, sodium hypochlorite) . . . . .	320
Herbicides, soap-based . . . . .	328
Biodegradable biobased mulch film. . . . .	335
Boric acid . . . . .	340
Sticky traps/barriers. . . . .	344
Copper sulfate . . . . .	346
Coppers, fixed . . . . .	346
Humic acids. . . . .	350
Micronutrients (soluble boron products). . . . .	354
Micronutrients (sulfates, carbonates, oxides, or silicates of zinc, copper, iron, manganese, molybdenum, selenium, and cobalt). . . . .	357
Vitamin B1, Vitamin C, Vitamin E . . . . .	360
Lead Salts . . . . .	361
Tobacco Dust (nicotine sulfate). . . . .	370
Proposal:	
Fatty Alcohols . . . . .	374
Anaerobic digestate - petitioned . . . . .	399
Strengthening the organic seed guidance. . . . .	420
Aeroponics/Hydroponics/Aquaponics/ Containers . . . . .	427
Discussion Document: Field and greenhouse container production . . . . .	428
Public Comment . . . . .	456
Adjourn. . . . .	542

1 P-R-O-C-E-E-D-I-N-G-S

2 (8:34 a.m.)

3 MR. CHAPMAN: We are starting this  
4 morning with public comments. And up first is  
5 Dan Bensonoff, followed by John Biernbaum.

6 Sorry, I have to actually do a formal something,  
7 something. Michelle, can you pull up the public  
8 comment slides again?

9 All right, as Michelle pulls up the  
10 public comment slides, just a quick reminder, and  
11 I will make it extremely quick. So for folks  
12 that weren't here yesterday, this is the Public  
13 Comment Policy from the NOSB Policy and  
14 Procedures Manual.

15 Comment time for this meeting is three  
16 minutes. We provide a lighting system that warns  
17 you about the time. It starts off green, and  
18 turns to yellow. At red, three minutes have  
19 expired. At that time, I ask you to please  
20 finish up your sentence, out of respect for other  
21 commenters and the Board.

22 At that moment, we'll open it up for

1 questions from members of the Board. If you have  
2 a presentation, there's a remote that you can use  
3 that will be on the stand to advance your slides.  
4 I will be asking everyone to start their comment  
5 by stating their name and affiliation for the  
6 record.

7 We ask that you disclose all relevant  
8 affiliations pertaining to matters of business  
9 before the Board. If members want further  
10 clarification, I encourage you to ask questions  
11 after the commenter has completed their comments.

12 Next slide, Michelle. No proxies are  
13 allowed. Commenters should refrain from making  
14 personal attacks or remarks that might impugn the  
15 character of an individual. If I hear something  
16 of this nature, I will interrupt the commenter  
17 and ask them to refrain.

18 And then our last request is that  
19 comments please be clear and succinct. And I  
20 also ask for that in the questions and answers  
21 period as well, that we try to answer the  
22 question as directly as possible.

1           We have a very full public comment  
2 schedule. We jam-packed as many public  
3 commenters as possible into the timeframe that we  
4 had. And unfortunately, we have to conduct some  
5 business this afternoon, so we're going to have  
6 to really stick to our time schedule. So this is  
7 a warning to the Board.

8           But I probably will act like I did  
9 near the end of the day yesterday to try to keep  
10 us on schedule, limiting questions as much as  
11 possible. Please save your questions for the  
12 folks that you really want to have that dialogue  
13 for so we can ensure we have enough time to get  
14 through all the public comments.

15           Also, I would be remiss if I didn't  
16 remind folks to turn off their cell phones and  
17 turn their computers on silent out of respect for  
18 everyone in the room.

19           With that, we'll get started. So Dan,  
20 if you could come back up. Sorry for bringing  
21 you up and sending you back. So up first is Dan,  
22 and Dan, you can start with your name and

1 affiliation for the record.

2 MR. BENSONOFF: Sure. Good morning,  
3 everybody. Thank you for allowing me to speak  
4 today. My name is Dan Bensonoff, and I'm a  
5 vegetable grower, but I'm here primarily  
6 representing the Northeast Organic Farming  
7 Association of Massachusetts.

8 We have about 1,000 members, and that  
9 includes both certified and non-certified  
10 farmers, and gardeners. We appreciate all of the  
11 important work that the Board has done on the  
12 question of hydroponics and container systems.

13 This is a decision that will define  
14 the shape of organic farming. And therefore,  
15 it's important we consider it from many  
16 perspectives.

17 I know you've all had your fill of  
18 this issue, not just in the last few days, but  
19 over the last few years, so I'll be brief and  
20 I'll just try to add my two cents.

21 I want to first acknowledge that at  
22 this NOSB meeting, I've been surrounded by so

1 many of my personal mentors and elders of the  
2 organic community, folks like Eliot Coleman, Jeff  
3 Moyer, and many others without whom there would  
4 be no organic movement in the US, soil based or  
5 otherwise.

6           Certainly, I would not be farming  
7 without their contributions, that's for sure.  
8 And so many of these elders came out here because  
9 they care deeply about organic farming. And  
10 regardless whether we think that hydroponic and  
11 container growing has merit, we ought to respect  
12 the vision of those who paved the way for us.

13           To do otherwise would be like walking  
14 into a foreign city and demanding they change  
15 their way of life. I certainly don't want to be  
16 guilty of that kind of disrespect.

17           Many of the members I'm here to  
18 represent recognize that hydroponic and aquaponic  
19 systems have many merits, especially in terms of  
20 their ability to provide year-round vegetables in  
21 urban and drought prone areas.

22           But we also recognize that organic

1 farming has never been just about resource  
2 efficiency. While many contemporary organic  
3 consumers turn to organic produce because they  
4 don't want toxic pesticides on their food,  
5 organic farmers know that the heart of organic is  
6 not what we don't do, but what we do do.

7           And what we do is work with biological  
8 systems. The ideal of organic farming is to  
9 mimic evolutionary relationships that connect  
10 plants with fungi and soil and animals into a web  
11 of interrelationships. It is the management of  
12 this ecological balance that defines organic  
13 production.

14           Hydroponic systems work in a different  
15 paradigm from soil based systems. The growing  
16 medium is referred to as a substrate, an anchor  
17 for the plants. Conditions such as temperature,  
18 light, fertility are fully controlled and nature  
19 is generally held at bay as much as possible.

20           Organic soil growers think of plants  
21 as one element within a larger ecosystem. It is  
22 this focus on whole systems that is critical, not

1 the exact amount of liquid or solid fertilizer or  
2 the ratio of one to the next.

3 This whole system's approach ensures  
4 that organic farmers are land stewards first and  
5 plant factories second.

6 Aside from the philosophical  
7 differences, I'll wrap up there. So I'll just  
8 wrap up by saying we support soil based systems,  
9 and I'm sure Emily's going to ask. We would be,  
10 as much as, you know, it's hard for us to say  
11 this, I think we would be willing to go on with  
12 the compromise that the Crops Subcommittee came  
13 up with. Thank you.

14 MR. CHAPMAN: Questions from the  
15 Board?

16 MS. BEHAR: We were hearing yesterday  
17 that there was some greenhouse operations in soil  
18 that were not really rotating crops. They were  
19 rotating tomatoes and compost.

20 MR. BENSONOFF: I work at one of  
21 those.

22 MS. BEHAR: Okay. So can you explain

1 why it is that a crop rotation, when I was doing  
2 many more organic inspections in the Midwest,  
3 there was a requirement that there was a rotation  
4 in that greenhouse, at least with a cover crop in  
5 between the cash crop.

6 MR. BENSONOFF: That's a great  
7 question. So first I should clarify that my farm  
8 is not certified organic as of right now. I will  
9 say that in general, so the rotation is not  
10 necessarily very clear. If, for example on the  
11 farm where I work, we grow tomatoes for a few  
12 years, and then we'll usually grow either  
13 cucumbers or eggplant or peppers in an off year.

14 We also have moveable tunnels so that  
15 does ensure some rotation in some of our tunnels.  
16 As far as I know, a lot of the farmers that I  
17 work with don't rotate primarily because of their  
18 markets.

19 But it really does depend on the  
20 certifiers and what they require. And NOFA does  
21 not do certifications in Massachusetts, it's done  
22 by base state. So I can't speak to that

1 directly. I know that on our farm, we rely  
2 primarily on compost, chicken manure, and a  
3 little bit of fish emulsion for our fertility in  
4 our houses.

5 MR. CHAPMAN: Asa?

6 MR. BRADMAN: I just, my question is,  
7 and one of the things that's challenging is that  
8 we have certifiers in several different parts of  
9 the country that do approve hydroponic, do  
10 approve --

11 MR. BENSONOFF: That's right.  
12 Including Massachusetts, by the way.

13 MR. BRADMAN: -- do approve container.  
14 And so it's, there's this tension. I wonder  
15 where you fall out on that, or do you see there's  
16 some sort of compromise that can kind of  
17 reconcile that diversity?

18 MR. BENSONOFF: Well, I think that, I  
19 mean, that patchwork right now isn't in fact the  
20 problem. And I would also add that it's not just  
21 that some certifiers do include container  
22 systems, it's that they look at them very

1 differently as well.

2 In Massachusetts, we have three  
3 hydroponic facilities that are certified. And I  
4 know our certifiers are very stringent in their  
5 requirements, and look really carefully at the  
6 systems approach. I can't speak with certainty,  
7 but as far as I've heard in other states, it's a  
8 little looser in terms of their requirements of  
9 those container systems.

10 So I would just say that whether  
11 there's a compromise reached, I think it's going  
12 to be really difficult to enforce the compromise  
13 that the Crops Subcommittee put together.

14 I think that it is better than  
15 nothing, but I think that it's going to be a  
16 challenge to enforce, and certifiers are going to  
17 have to really learn a lot in terms of, you know,  
18 how do you measure fertility at the outset, how  
19 do you make sure that the nitrogen requirements  
20 are met?

21 MR. BRADMAN: Well, I mean, just to  
22 take it out a little bit further though, what

1 about compromise in terms of labeling and  
2 accepting some diversity because that's where the  
3 differences I think are even larger. And it  
4 seems to me there's an opportunity for having  
5 strict standards, absolutely.

6 MR. BENSONOFF: Yes. I would like to  
7 reward container growers who do not use toxic  
8 inputs, who rely on organic fertility. I think  
9 that they should differentiate themselves. I  
10 honestly don't know whether it makes sense to put  
11 that into the USDA Organic program or not.

12 I have mixed feelings about that. I  
13 will say that as I'm looking at this label that's  
14 behind you all, behind that word organic I see  
15 soil based system. So I don't really know if it  
16 makes sense to put organic hydroponics.

17 I worry about how prominent that would  
18 be in the marketplace. Would the organic be in  
19 big bold letters and the hydroponic sort of be a  
20 little asterisk beneath it? Or would it really  
21 be clear to consumers. That's part of the  
22 question I would have.

1 MR. CHAPMAN: Joelle?

2 MS. MOSSO: You made a comment in  
3 regards to the organic community, or the consumer  
4 that made primarily by organic due to less toxic  
5 pesticide. I'm curious as to your opinion about  
6 where their opinion lies in regards to this  
7 issue, because they are definitely part of the  
8 continuum of organic.

9 MR. BENSONOFF: Yes, so that was based  
10 primarily on anecdotal evidence. We work with a  
11 lot of organic consumers, and I do a lot of  
12 events where I speak to people about what organic  
13 is.

14 I personally think that we need to  
15 balance what organic consumers want with what  
16 organic farmers define their systems as and how  
17 they intended their systems to run.

18 So I think in this conversation  
19 there's been maybe a little bit too much focus on  
20 what organic consumers think it is. And most of  
21 them have a pretty basic understanding. I mean,  
22 they think it means something that's healthier,

1 something that's less toxic. And that is  
2 somewhat true.

3 But there's so much more to it than  
4 that. So I would say I think that you're going  
5 to find a lot of different data out there if you  
6 look at the survey results because as many of you  
7 know, it depends on who's asking the questions  
8 and how those questions are framed.

9 So I would take survey results  
10 somewhat with a grain of salt depending on who's  
11 asking them. But I would say that the producers  
12 are the ones who put these systems together,  
13 they're the ones who advocated for them from the  
14 very beginning. That's really who we need to be  
15 looking at first.

16 And consumers are going to follow  
17 regardless of what we put in place. They're  
18 going to continue to stick with organics as they  
19 have, as long as it's clearly defined and as long  
20 as those who started the movement continue to  
21 rely on it.

22 MR. CHAPMAN: Emily?

1 MS. OAKLEY: I don't normally want to  
2 comment, but I just want to say that your answer  
3 to that question would have been almost identical  
4 to mine. So thank you.

5 MR. CHAPMAN: Thank you. We are now  
6 15 minutes behind schedule. Up next is John  
7 Biernbaum followed by Isaura Andaluz. Sorry if I  
8 butchered that. John, you can start with your  
9 name and affiliation for the record.

10 MR. BIERNBAUM: My name is John  
11 Biernbaum. I'm here representing the Michigan  
12 Organic Food and Farm Alliance who I serve as the  
13 Chair of the Board of Directors that I've been on  
14 for the last nine years, and I'm also here as a  
15 faculty member in the Department of Horticulture  
16 at Michigan State where I've been for over 30  
17 years, and I teach.

18 My job really is to help people  
19 understand the why and the what of organic  
20 farming. I teach the organic farming principle  
21 and practices course. I also was a member of the  
22 NOP Organic Task, excuse me, the Hydroponic Task

1 Force.

2 My 40 plus years of career and life  
3 experience related to both conventional plant  
4 production and greenhouses where I taught  
5 greenhouse management for 30 years and helped  
6 many greenhouse growers learn how to fertilize  
7 their plants with water soluble inorganic  
8 fertilizers.

9 And then the last 20 years of working  
10 with organic farmers and working with students to  
11 start the student organic farm which is a 48 week  
12 CSA, that has been certified since 2004 using  
13 high tunnels and, you know, closed production,  
14 has set me in a unique position to really stand  
15 between the perspective of the keep the soil in  
16 organic view, as well as the coalition of  
17 sustainable organics where they're more  
18 supporting the hydroponics.

19 I would ask you as the NOSB Board  
20 members, particularly those of you that are  
21 undecided, to please vote on the first three  
22 proposals to prohibit the use of hydroponics,

1       aeroponics, and aquaponics.

2               Clearly, it's very difficult for me to  
3       see the word organic and hydroponics together.  
4       It's unfortunate that that has been allowed to  
5       happen, but it never should have been allowed to  
6       happen, and we need to stop that.

7               Regarding the second proposal about  
8       the containers, that's a little more challenging.  
9       I fully support the system that would be in line  
10      with the IFOAM and the EU grown in soil, in the  
11      ground, under the sun.

12              But I also spent 15 years of my life  
13      working on how we could grow in containers if it  
14      was allowed in organic. And I can tell you that  
15      I do believe it is very possible to meet the  
16      definition as it's been provided. I think it's  
17      actually an elegant, simple way of defining it,  
18      well maybe not simple.

19              It would be difficult for people to  
20      understand why it works, but we have been working  
21      for many years making compost from local  
22      materials, leaves, wood chips, granular wood

1 chips, grass, hay, and straw, and we can grow  
2 plants for many months, many years in that media  
3 successfully, without making a lot of soluble  
4 inputs.

5 So it's -- yes, I figured it was about  
6 time there. Off by just a little bit.

7 MR. CHAPMAN: Francis?

8 DR. THICKE: Thank you, John.

9 Yesterday, Jerry Davis told us that in his  
10 experience, he has some really good compost, and  
11 he could grow tomatoes from start to finish. And  
12 then when he ran out of that good compost, they  
13 wouldn't go very far, they faded out at three  
14 months or something.

15 Could you tell us about what it takes  
16 to make that kind of good compost, and have you  
17 done that?

18 MR. BIERNBAUM: Yes. I was glad to  
19 hear him say that, and I think that's really the  
20 question that we're after, and that compost  
21 unfortunately is not well defined and it can have  
22 low nitrogen content from as little as one

1 percent to we're making things that have three  
2 percent.

3 So very big difference in the nitrogen  
4 content, very big differences in the stability.  
5 It might be used after a few months. We're  
6 working with things that we're using that are  
7 over a year old.

8 And then how do you get the nutrients  
9 into a form that are going to be there for long-  
10 term, slow release. You pointed out late  
11 yesterday that it's not about putting in a fish  
12 meal or, you know, plant meal or whatever in and  
13 expecting that to release the nitrogen.

14 We have to get that nitrogen first  
15 into a biological form, and then into a form  
16 where it's release is restricted either  
17 chemically by having it be more complex, or  
18 physically by having it occluded or contained in  
19 particles where it's released over a longer  
20 period of time, or by affecting the biology.

21 We can think about how to manage that.  
22 And unfortunately, composting has been a waste

1 management strategy. How do I get rid of this  
2 stuff. And what we have to do is see it in new  
3 eyes as a resource management strategy.

4 I need to grow plants, I want to make  
5 this media, how can I do that effectively. And  
6 that's what I've used my greenhouse background, I  
7 know what it needs to look like in a container,  
8 and then I work to make the compost look like  
9 that.

10 Last idea is that just one compost  
11 probably won't work. We're working on taking  
12 multiple composts, so ones that are less mature  
13 that will continue to release over a longer  
14 period of time with one that is very mature that  
15 will provide the immediate release that you need  
16 so that you can get this combination.

17 MR. CHAPMAN: Dan?

18 DR. SEITZ: You mentioned that because  
19 of your experience working in greenhouses,  
20 working with organic farmers, working with  
21 conventional farmers that you were uniquely  
22 placed to really be able to understand this

1 issue.

2                   And you gave us your opinion on why we  
3 should vote against allowing hydroponics and so  
4 forth. But you didn't break out your reasons.  
5 If you could just do that succinctly, having had  
6 these experience, what are the two or three  
7 reasons that stand out to you as the reasons why  
8 we should vote in the way that you advocate?

9                   MR. BIERNBAUM: I have experience  
10 using hydroponics. As a young person, I helped  
11 my grandfather and uncle build a gravel culture  
12 greenhouse and I learned how to make the  
13 hydroponic, the solutions and such. And I've  
14 also dabbled in aquaponics.

15                   What you're doing in those systems is  
16 trying to create a condition where the nutrient  
17 levels are usually consistent, and so that the  
18 plant is not stressed, so that you're able to  
19 maximize growth, and maximize yield, particularly  
20 under conditions where you can also manage the  
21 light and the temperature to minimize that  
22 stress.

1                   That to me does not sound like an  
2                   organic system, you know, where we're, the plants  
3                   are typically stressed and limitations are part  
4                   of that system as the plant is developing, and  
5                   that that's an important part of how a plant  
6                   becomes resilient to further stresses and how we  
7                   can help that plant to be, well there's a better  
8                   word than resilient, but able to tolerate things  
9                   in its condition and survive when conditions  
10                  change.

11                  MR. CHAPMAN: Dave? Asa, then Sue.

12                  MR. BRADMAN: Last night, I reread the  
13                  Task Force report for on hydroponics, and you  
14                  were on the committee. This report is  
15                  bifurcated. You know, there's almost, like,  
16                  three reports or two reports.

17                  And I just want to comment on what  
18                  that process was like and you know, was there an  
19                  attempt to get consensus. And then the last  
20                  section there's proposals for ideas about  
21                  labeling. And I'm just curious to hear a little  
22                  bit more about what that process was.

1                   MR. BIERNBAUM: In hindsight, I think  
2                   it's unfortunate that that happened. You know,  
3                   what we did was did what we were charged to which  
4                   was to provide you information to the NOSB to  
5                   help make a decision.

6                   But in some way we abdicated that  
7                   decision by not having, you know, that discussion  
8                   and making those decisions with our own  
9                   committee. But that's really, we weren't told to  
10                  do that. We were told to provide information we  
11                  were told not to necessarily make the decision.

12                  The views are so different, all right.  
13                  And hydroponics, as you've heard over and over  
14                  again, is a system that works. All right? But  
15                  I've been taught a philosophy of approaching  
16                  different perspectives and how do you decide, and  
17                  the first is to recognize that almost all ideas  
18                  have some value.

19                  All right, hydroponics has value. But  
20                  most ideas are incomplete. All right, thinking  
21                  of hydroponics as an organic system to me is an  
22                  incomplete thinking. They're not aware really of

1 what organic farming is.

2 On the Soil Subcommittee, if you add  
3 up the experience of just three of the members,  
4 there was 100 years of experience. In between  
5 the six or seven of us there was over 160 years  
6 of organic farming experience.

7 On the other committee, there was, you  
8 know, maybe one tenth of that. You know, they  
9 didn't have the same perspective of organic  
10 farming. And so just because, you know, they  
11 view, well maybe I can best sum it up myself.

12 Twenty years ago, I read the OFPA and  
13 said this is great, I can grow with all these  
14 fertilizers and these inputs and make this work.  
15 But I didn't stop there. I should say it was the  
16 same conclusion that many of these hydroponic  
17 growers came to.

18 I went to meetings and visited farms,  
19 and I learned that no, that's not correct. That  
20 really those methods were intended to grow  
21 transplants. And because the rule does not  
22 correctly define and differentiate transplants

1 from harvested crops, that led to the  
2 misinterpretation that has allowed organic  
3 farming to happen, or excuse me, organic  
4 hydroponics to happen.

5 That never should have been allowed to  
6 happen. We heard it yesterday from three  
7 different NOSB members that that was never the  
8 intent. But our committee had to wrestle with  
9 what we were assigned to do, and it wasn't a  
10 great situation.

11 MR. CHAPMAN: Thank you. Sue, then  
12 Harriet.

13 MS. BAIRD: Hi, John. Thanks for, he  
14 came down and taught a class for us at the MOA  
15 one year, so thank you for that. And I know you  
16 teach greenhouse production, you did at our  
17 conference.

18 Do you produce year-round in Michigan  
19 in your greenhouses?

20 MR. BIERNBAUM: Yes, primarily more in  
21 high tunnels, unheated greenhouses. But we also  
22 have some heated greenhouses. I have one that's

1       been in use with soil for 20 years with only  
2       compost and mineral amendments.

3               MS. BAIRD: Do you modify the  
4       environment?

5               MR. BIERNBAUM: In that one, there is  
6       heat to heat the greenhouse, yes.

7               MS. BAIRD: And lighting?

8               MR. BIERNBAUM: No.

9               MS. BAIRD: No?

10              MR. BIERNBAUM: For transplants, for  
11       crop production to harvest, no. But for  
12       transplant production, it would sometimes be  
13       supplemental light use.

14              MS. BAIRD: There is supplemental  
15       light. Okay, another question, and this is not  
16       fair to ask you, I should have asked the  
17       gentleman in front.

18              But it appears, here in the Northeast  
19       anyway, probably because of the short growing  
20       time for tomatoes, that the certifiers are not  
21       allowing, or not requiring crop rotation because  
22       of the timeframe. You know, they get off the

1 crop of tomatoes, and then they say they don't  
2 have time to put in any kind of cover crops.

3 What is your interpretation of that,  
4 because you teach NOP compliant systems. And of  
5 course, we know 205 says producer must implement  
6 crop rotation.

7 MR. BIERNBAUM: I would agree with  
8 your assessment, that certifiers are allowing  
9 that. I believe that is wrong. You know, I  
10 worked for years when I started how to develop  
11 rotations for greenhouses.

12 All our greenhouses are fully rotated  
13 between cool season and warm season, and we deal  
14 with the problem that you have a high  
15 concentration of solanums in the summer and you  
16 have a high concentration of brassicas in the  
17 winter. All that can be dealt with, and it  
18 should be dealt with.

19 And it's because of the certifiers or  
20 because of the interpretation, you know, that it  
21 doesn't have to happen in greenhouses because  
22 there was never a greenhouse regulation done by

1 the NOP that those things are allowed to happen.

2 So I wouldn't blame the farmers, but  
3 it is wrong.

4 MS. BAIRD: Okay, thank you.

5 MR. CHAPMAN: Harriet?

6 MS. BEHAR: So you work with a lot of  
7 young people. And I know that we hear a lot that  
8 hydroponics is an access point for beginning  
9 farmers and small scale farmers to move into  
10 farming, and that without hydroponics, these  
11 people would not have access to being farmers.

12 So for the people that you are  
13 teaching in your school, do you find that they've  
14 been able to become successful small or mid or  
15 large scale farmers in soil, or do you think that  
16 we're closing a door on young people to get into  
17 farming?

18 MR. BIERNBAUM: I've literally worked  
19 with hundreds of students over the last 15 years  
20 who have gone out, and many of them I can, could  
21 probably name 20 or 30 who have gone out and  
22 either worked on farms or started farms, none of

1       them hydroponically.

2                   Any of the students in class when I  
3       came back and I talk about being on the task  
4       force, are appalled at the idea that hydroponic  
5       would be allowed as organic. I have not met one  
6       student that, well I take that back.

7                   There's maybe one or two, you know,  
8       that started out thinking that maybe you could do  
9       it organically. But when explained what the  
10      limitations are, you know, accept that they're  
11      not aligned. They are antithetical, opposite,  
12      you know, they're just not the same thing.

13                  MR. CHAPMAN: Thank you. I have one  
14      question for you as well. You mentioned just  
15      right there that organic farmers are appalled by  
16      hydroponic organic, and you mentioned three  
17      previous NOSB members who testified about this.

18                  And I probably should have asked them  
19      this question as well. But as far back as 1995,  
20      the NOSB wrote something along the lines of  
21      hydroponic production and soil media may be  
22      labeled organically, organically produced and

1 shall be allowed if provisions of OFPA are met.

2 Now there's a lot of debate that's  
3 gone on around what was truly meant by that, but  
4 that line is in there. It opened the door. That  
5 is the basis for this opening that we're dealing  
6 with now.

7 And I don't see any similar statement  
8 in anything around, like, opening the door to  
9 other clearly prohibited practices in organic  
10 like GMOs. That door would not be slightly even  
11 cracked like that.

12 So how do you rectify that that's back  
13 as far as 1995, but you're saying it's appalling  
14 and no one would ever, ever consider these to be,  
15 you know, used in the same sentence?

16 MR. BIERNBAUM: I would rely on what  
17 I heard yesterday, and plus I've asked that  
18 question over and over again through the process  
19 is that you've just said it was the NOP that said  
20 that.

21 MR. CHAPMAN: The NOSB. That's from  
22 the National Organic Standards Board, the very

1 first one.

2 MR. BIERNBAUM: So the NOC, that  
3 National Organic Coalition?

4 MR. CHAPMAN: National Organic  
5 Standards Board, this board in 1995. That is  
6 some of the members that have testified here.

7 MR. BIERNBAUM: Some of the members,  
8 okay. So you know, again --

9 MR. CHAPMAN: It was a unanimous vote.  
10 That's all 15 members wrote hydroponic production  
11 and soil media may be labeled organically  
12 produced, shall be allowed if all provisions of  
13 OFPA have been met.

14 MR. BIERNBAUM: My understanding, what  
15 I've heard by many of them in the committee, the  
16 people that talked was is that they never, when  
17 they said as long as the other provisions were  
18 met, that they didn't think that that would ever  
19 be possible, that it was coming back to this idea  
20 of a compromise that they thought they were  
21 yielding to some people on the committee that had  
22 that perspective, but that it was a minorities

1 perspective.

2 And rather than fight it then, that  
3 they compromised because they thought it would  
4 never go forward. Is that I think is the answer  
5 to your question. And again, it's what I argued  
6 on the task force. It is unacceptable to leave  
7 these important issues, you know, without using  
8 accurate words.

9 The best example is a greenhouse in  
10 the NOP from the beginning has been defined as an  
11 enclosed, a permanent enclosed structure. That  
12 is not acceptable. A greenhouse is a structure  
13 with a transparent roof, and that has led to many  
14 issues that are problems with lighting and things  
15 being done in buildings because greenhouse wasn't  
16 defined properly.

17 So accurate use of words and really  
18 dealing with these things, which you're having to  
19 deal with now, is very important.

20 MR. CHAPMAN: Thank you. Thank you  
21 very much. Up next is Isaura followed by Terry  
22 Shistar. Isaura, can you start with your name

1 and affiliation for the record.

2 MS. ANDALUZ: Good morning. Isaura  
3 Andaluz, and I'm with Cuatro Puertas, a community  
4 development corporation in Albuquerque, New  
5 Mexico. I also sit on the board of OSGATA and  
6 the steering committee for the Organic Farmer's  
7 Association.

8 I've been a grower and a beekeeper for  
9 about 30 years. And through Cuatro Puertas we  
10 have an organic seed breeding program where we  
11 work with community in trying to get new farmers  
12 to build seeds, I mean grow seeds.

13 In Albuquerque, we I work with seeds  
14 resilient to temperature extremes. Our normal  
15 late spring highs of 90 degrees went up to 100  
16 degrees last year, and 105 this year. New  
17 seedlings baked in the intense heat, and even  
18 established plants had scorched edges.

19 Eventually, almost everything  
20 recovered, and the fruit trees produced  
21 abundantly. All I did was watch and water.  
22 These plants were in the soil in the ground.

1           Organic farming is part of a complete  
2 living system that works with nature. Everything  
3 is connected. There is not one person,  
4 corporation, or government that can create a seed  
5 or soil. No one.

6           Seeds are the memory of life. Soil is  
7 a reservoir of water, bacteria, and fungi.  
8 Without soil, no seed can continue its journey  
9 into the future, and no one, humans, animals,  
10 insects, or reptiles will have food. No one.

11           The organic movement was born of the  
12 simple but profound recognition that all life on  
13 dry land, on mother Earth comes from the soil.  
14 It addresses health and the possibility of a  
15 future. It is about ethics and the foundation of  
16 society.

17           The soil food web is educational bible  
18 by which we understand the process and is a  
19 product of a practical model of application for  
20 the creation of a truly sustainable agro-  
21 ecosystem.

22           That is a system that functions as a

1 coherent organism, with no dependents on external  
2 inputs beyond what nature provides, sun and rain  
3 and hydrologic flow, and no accumulation of  
4 harmful outputs.

5 In other words, no waste. That is the  
6 definition of sustainability, and what is at risk  
7 now. I've participated in two rounds of the  
8 USDA's Agriculture Center 21 committee which  
9 served to rubber stamp recommendations from the  
10 farm bureau and the biotechs.

11 These recommendations were later used  
12 to justify decisions made by government agencies.  
13 So I am well aware of the influence of money in  
14 our public process. The last AC21 recommendation  
15 made all crops' identity preserved except for GE,  
16 genetic engineered.

17 This means that the farmers assume all  
18 responsibility to protect themselves from G  
19 contamination or damage, further threatening an  
20 organic farmer's right to farm, and human  
21 dignity.

22 Hydroponic systems do not come from

1 the Earth. This is an idea that comes from  
2 corporate boardrooms and the industrial  
3 manufacturing world. It is about distorting  
4 organic standards and definitions. It addresses  
5 only the marketplace and is focused on short term  
6 transactions.

7 As such, this is yet another foolish  
8 attempt to convert sustenance and nourishment,  
9 the gifts of the commons into commodities,  
10 proprietary formulas, and profit, and it seeks to  
11 do this again by limiting the workforce, the  
12 living creatures who make up the soil on which  
13 our lives depend.

14 Let's take this idea and return it to  
15 the fungal substrate where it belongs. And I  
16 also want to say that as a community economic  
17 consultant, I did work with an aquaponics  
18 operation in New Mexico that was doing Tilapia  
19 fish farming, which failed.

20 MR. CHAPMAN: Thank you. Questions?  
21 Harriet?

22 MS. BEHAR: Thank you for bringing the

1 soul to organics.

2 MS. ANDALUZ: Thank you.

3 MR. CHAPMAN: Thank you. Up next we  
4 have Terry Shistar followed by Marni Karlin.  
5 Terry, you can start with your name and  
6 affiliation for the record.

7 MS. SHISTAR: Hi. My name is Terry  
8 Shistar and I'm on the board of Beyond  
9 Pesticides. We have a long history of  
10 involvement with organic production, and here are  
11 some of our present and former board members.

12 We submitted comments on all of the  
13 issues before the Board at this meeting. A  
14 couple of years ago, NOP tried to rewrite the  
15 NOSB charter to say that most of the Board's work  
16 was done.

17 Well, that's not true. The NOSB has  
18 entered a new stage. The original work of  
19 establishing a National List and regulations  
20 defining the program has been completed, and the  
21 NOSB has entered the stage of refining the  
22 program so that it remains consistent with

1 organic values as organic production grows.

2 Some of those refinements have been  
3 made, such as the rearrangement of the sunset  
4 schedule to even out the workload of the Board,  
5 while others are awaiting final action by NOP.

6 There's a great deal more to be done  
7 though. Some of this work is work that has been  
8 put off, some arises as the maturing of organic  
9 into a nearly \$50 billion enterprise, and some is  
10 unanticipated.

11 Most importantly, the NOSB must ensure  
12 the adequate oversight of the program that's in  
13 place to ensure consistent certification and  
14 enforcement of the law to protect organic  
15 producers and consumers.

16 While the work of examining materials  
17 as petitioned at sunset continues, some items on  
18 the NOSB agenda at this meeting are examples of  
19 issues that need to be addressed by that mature  
20 NOSB.

21 Preventing certifiers from certifying  
22 organic, or certifying as organic hydroponic

1 operations, eliminating incentives to convert  
2 native land to organic production, clarifying  
3 that prohibition of genetic engineering and  
4 ensuring that all steps in the organic supply  
5 chain are covered by enforcement.

6 But there are other issues that should  
7 remain on the work agenda. Evaluating so called  
8 inert ingredients which make up the largest and  
9 often the most toxic part of allowed pesticides.  
10 This has been identified as unfinished business  
11 since OFPA was passed.

12 The NOSB has recommended a process  
13 which requires as a next step a memorandum of  
14 understanding between USDA and EPA. Looking at  
15 the need for and characteristics of materials  
16 used as cleansers, disinfectants, and satirizers  
17 to ensure that necessary materials are provided  
18 on the national list, and that they are evaluated  
19 using OFPA criteria.

20 Examining contaminated inputs and  
21 means to eliminate them and mitigate their  
22 inputs, evaluating materials such as marine algae

1 whose use in organic production contributes to  
2 ecological harm as organic production expands in  
3 scale.

4 Enforcement of imports as organic  
5 production, both globally and domestic producers  
6 rely on imported feed grains, and restoring the  
7 meaning of sunset to ensure the continuous  
8 improvement of organic integrity. Thank you.

9 MR. CHAPMAN: Thank you, Terry.  
10 Emily, Dan, Dave.

11 MS. OAKLEY: This is actually a  
12 question for the NOP regarding one of the  
13 comments that Terry made, the comprehensive  
14 review of sanitizers that we've asked to have on  
15 our work agenda.

16 I was wondering what the status of  
17 that was. And assuming that that will be, I do  
18 assume that that will be approved as our requests  
19 typically are.

20 DR. LEWIS: Thank you, Emily. So that  
21 was a question that was asked yesterday by  
22 Harriet. So we just received the work agenda

1 item. We need to talk with our new leadership  
2 team that just came on board. So looking forward  
3 to sharing that with them and discussing it in  
4 terms of next steps.

5 As I mentioned yesterday also, this is  
6 a new topic that we want to be thinking about.  
7 And if the public has any information to help the  
8 Board as part of this possible work, we encourage  
9 you to provide public comments on this issue.

10 MR. CHAPMAN: Dan?

11 DR. SEITZ: Could you help me  
12 understand a little bit more the inert issue?  
13 Maybe just tell us a couple of examples that if  
14 we knew those were inert ingredients that we  
15 allow just because we call them inert, we might  
16 be troubled or even horrified to find out that  
17 those are allowed under our standards.

18 And then also, would it be through our  
19 technical reviews, asking for that type of  
20 information if we asked that any inerts be  
21 identified and be described, would that be a way  
22 for us to begin looking at inerts?

1 MS. SHISTAR: Okay.

2 DR. SEITZ: I know it's a big topic.

3 MS. SHISTAR: To answer the first  
4 question, for nonylphenol ethoxylates are one,  
5 that's one example of some toxic, endocrine  
6 disrupting chemicals that are used as inert  
7 ingredients in some pesticides. They're used as  
8 surfactants.

9 BHA, or BHT, maybe both BHA and BHT  
10 are also examples. I don't have a list in front  
11 of me, but last meeting we submitted a report  
12 that contained the whole list of those that are  
13 used in organic production.

14 As far as the Board has actually set  
15 up a process for reviewing inerts. And I don't  
16 know, if the process were to if you look at a  
17 pesticidal active ingredient that's allowed in  
18 organic, and look at the inerts that are  
19 associated, you might find, you might run into  
20 problems with confidential business information.

21 So the process that was recommended by  
22 the Board involves divorcing the inerts from the

1 actives, though looking at them together is  
2 actually better. But so the process that was  
3 suggested by the board involves looking at them,  
4 working with EPA and EPA's Safer Chemical --

5 MR. BRADMAN: Safer Choice Program.

6 MS. SHISTAR: Safer Choice Program,  
7 yes. To evaluate them. And that seems to be a,  
8 it's a good way to go because working with Safer  
9 Choice Program involves EPA, it uses EPA to  
10 produce basically technical reports that the NOSB  
11 can then evaluate.

12 MR. CHAPMAN: Thank you, Terry.

13 MS. SHISTAR: That's the way I see the  
14 system working, anyway.

15 MR. CHAPMAN: Dave?

16 MR. MORTENSEN: Terry, I, as a new  
17 member of the NOSB, I'm really amazed at the  
18 workload. It's enormous, and it's a volunteer  
19 board. I'm curious if you have any ideas about  
20 how a group like yours or others that have been  
21 in attendance here could be more actively engaged  
22 in working with the Board to move things along.

1                   Something like the inerts, and several  
2 of us have been looking at that. And you know,  
3 we want to get that going for sure. That is  
4 going to be a huge task, I can say just having  
5 read the documents that have been written so far.

6                   Any thoughts about how organizations  
7 like yours could help in this process more  
8 actively?

9                   MS. SHISTAR: All you have to do is  
10 ask. Really. And we're happy to help.

11                  MR. MORTENSEN: I guess I would just  
12 personally encourage folks in the room to be  
13 thinking about how we, you know, think about ways  
14 of supporting the work of the Board more  
15 actively. And I'm not sure that actually leaving  
16 it to Board members to ask for help is the  
17 solution. Just --

18                  MS. SHISTAR: Well, okay, so here's  
19 another --

20                  MR. MORTENSEN: And I bring this up  
21 because we, you know, just imagine, I was  
22 involved with some other things with the EPA over

1 the last ten years. EPA has a whole Staff that  
2 reads public comments, 4,000 public comments on  
3 24d, right? And then I would work with the EPA  
4 folks that had read through the public comments,  
5 we're reading 2,400 public comments on top of all  
6 this other stuff.

7 And so I'm just, I just am sure that  
8 there must be a better way than we're proceeding  
9 right now to help get the work of the Board done.

10 MS. SHISTAR: Okay, so this is what  
11 the open docket was created for was to allow a  
12 two way exchange in between the meeting public  
13 comment times so that the Board could indicate to  
14 the public what they're working on, what  
15 information is needed, and we could submit  
16 information to you when it's not that busy time  
17 when you're reading 2,400 comments or something.

18 And I think the process has been set  
19 up and can work well, but it really requires a  
20 two way communication. It requires the Board to  
21 let us know what information you need in the  
22 interim.

1 I'm a fairly faithful reader of the  
2 subcommittee notes, but they don't always say  
3 what information you need. And when I find that  
4 there's information that I can provide, I try to  
5 provide it.

6 But I think that using that open  
7 docket system as a two way means of communication  
8 could really be helpful to the Board.

9 MR. MORTENSEN: Thank you, Terry.

10 MR. CHAPMAN: Thank you. We're going  
11 to have to move it along. I request that Board  
12 members keep their questions succinct so we can  
13 get to lunch sometime today. I know it's still  
14 early in the morning, but we are currently 30  
15 minutes behind, which means we will work through  
16 lunch if that's what's necessary.

17 So Marni Karlin is up next, followed  
18 by Jay Feldman. Marni, if you can start with  
19 your name and affiliation for the record.

20 MS. KARLIN: Thanks, Tom. Good  
21 morning. My name is Marni Karlin and I'm an  
22 independent organic policy consultant with Karlin

1 Strategic Consulting, and today I'm testifying on  
2 behalf of Nature Ripe Farms, a certified organic  
3 producer of blueberries in containers.

4 I would first like to acknowledge the  
5 strides that have been made on this issue of  
6 certified organic container production. For the  
7 first time, this meeting's documents demonstrate  
8 a consensus on the Board that container  
9 production should be allowed in organic with  
10 appropriate standards.

11 And that consensus should be  
12 applauded. It has taken a lot of hard work to  
13 get here. Of course, the question remains what  
14 do those standards look like, and that's where  
15 the rubber hits the road.

16 It is consistent with OFPA and with  
17 the principles underlying organic that we focus  
18 on an outcome based standard rather than  
19 prescribing amounts of inputs that are allowed,  
20 because of course organic is not a set of  
21 standards for input and substitution, but rather  
22 about creating a set of sustainability outcomes.

1                   So we look at fostering a national and  
2                   diverse soil ecology and maintaining and  
3                   improving biodiversity, and soil and water  
4                   quality. We identify a variety of site specific  
5                   approaches that would achieve those outcomes,  
6                   approaches like incorporating hedgerows,  
7                   recycling water and substrate materials, using  
8                   borders.

9                   This is exactly how we, as an organic  
10                  community, have looked at the crop rotation  
11                  requirement as it pertains to perennials for  
12                  years. We look at the desired outcome and  
13                  determine whether a grower of perennials utilizes  
14                  organic compliant methods that achieve those  
15                  outcomes.

16                  So where do we go from here? The  
17                  minority view is a step in the right direction.  
18                  And that along with the consensus that container  
19                  production should be allowed in organic  
20                  encourages me that despite how it might feel  
21                  right now, we are actually near compromise.

22                  Someone yesterday commented that it's

1 really frustrating to feel like we're in this me  
2 or thee situation, and it's easy to feel that  
3 way, both in this room and in our society writ  
4 large these days.

5 But I don't think it has to be that  
6 way. I believe we can take a step back, identify  
7 where we have consensus, and create a we  
8 standard, not a me or thee standard but an  
9 outcome based standard that works for the organic  
10 sector.

11 And what the organic sector wants is  
12 a strong, consistently applied outcome based  
13 standard. I encourage the Board to send this  
14 proposal back to the Crop Subcommittee for  
15 continued work on such an outcome based standard,  
16 something that focuses on ensuring outcomes  
17 rather than prescribing inputs.

18 I commend you for your progress, and  
19 implore you not to walk away from this important  
20 issue, but rather to see it through and continue  
21 to work towards that standard. As a sector, we  
22 need a clear standard that can be applied

1 consistently, and we rely on the NOSB to create  
2 such things.

3 And finally, I would really like to  
4 thank each of you for your service on this Board.  
5 I know it's hard work. I know it's a volunteer  
6 board. And at times you probably feel like  
7 you're just angering everyone.

8 But that's actually when we're close  
9 to the compromise that moves us forward, and I  
10 implore you to keep working on that. Thank you.

11 MR. CHAPMAN: Thank you. Thank you,  
12 Marlin.

13 MS. KARLIN: Thanks, Tom.

14 MR. CHAPMAN: Up next is Jay Feldman  
15 followed by Nate Lewis.

16 MR. FELDMAN: Good morning. I am Jay  
17 Feldman, Executive Director of Beyond Pesticides,  
18 served on the NOSB from 2010 to 2015, and chaired  
19 the Crops Committee for a time, and then four  
20 years on the Inerts Task Force. So there's a lot  
21 of history there on inerts.

22 I would like to talk a little about

1 the process based approach that OFPA is, and the  
2 law, the science, and the practice that is  
3 involved in that decision making.

4 The role of the NOSB is a key issue I  
5 think that we need to address here, the NOSB  
6 being the keeper of the organic label. First and  
7 foremost, the Board must ensure that there's  
8 public trust in that label, which translates into  
9 market demand.

10 We heard yesterday about protecting  
11 the brand. Integrity of the process establishes  
12 that trust.

13 Secondly, the context of the decisions  
14 before you is critical. Yes, the job of the NOSB  
15 members to bring the voice of the stakeholder  
16 group that you represent to the discussion.

17 However, in the context of the law, we  
18 must adhere to the criteria established by the  
19 law and the policies and procedures established  
20 by the Board, previous Board decisions, and the  
21 underlying and emerging science, or new science.

22 We must recognize there is a balance

1 struck so that the public trusts the process.  
2 You have to be willing as a Board member to  
3 accept that not everything can be labeled as  
4 organic.

5 And remember why the Board was  
6 established. You are on a Board to one, guide  
7 the process to tell USDA what is good for  
8 organic, what is legal under the law, to  
9 challenge the deficiencies that undermine the  
10 value of the label.

11 That goes to enforcement, weaknesses  
12 in the certification and inspection process,  
13 failures of government to follow Board  
14 recommendations, and you must help guide the  
15 organic community to continuously improve as part  
16 of the five year sunset review process.

17 Government is too often crisis driven.  
18 The NOSB, the reason you're sitting there is to  
19 seek to avoid crises. Government waits for  
20 Washington Post articles and law suits, then  
21 focuses on putting out the fire.

22 The NOSB must seek to avoid fires by

1 having a pulse, or knowing the pulse of the  
2 organic community and the issues before us.

3 Organic grew with every food safety  
4 crisis that was before EPA and FDA. Even though  
5 FDA and EPA saw those crises coming, organic will  
6 shrink with every organic crisis if the NOSB  
7 doesn't get out in front of these issues.

8 Organic differentiates itself in the  
9 market by design and standards, alternative  
10 labels. Every time an alternative label appears  
11 on a product alongside an organic, the organic  
12 seal, it undermines public trust in organic.

13 Isn't organic regenerative of the  
14 land, non-gmo, humane to animals, bird friendly,  
15 rainforest friendly, protective of those who work  
16 organic farms? It should be if it isn't.

17 MR. CHAPMAN: Thank you. Thank you,  
18 Jay. Up next is Nate Lewis followed by Rex  
19 Kittle. And I don't see Rex Kittle walking up,  
20 so Nate, hold on one second. After Rex Kittle is  
21 Phil LaRocca. Just make sure Phil knows he's on  
22 deck after that. Nate, you can start with the

1 name and affiliation.

2 MR. LEWIS: Sure. Good morning, my  
3 name is Nate Lewis, Farm Policy Director for the  
4 OTA. I also chair the Washington State  
5 Department of Agriculture's Organic Advisory  
6 Board, I own and manage an organic livestock  
7 crop, wild crop and aquiculture farm in Olympia,  
8 Washington. Our initial inspection is schedule  
9 for two days from now. And I'm on the Board of  
10 Directors for the Olympia Community School where  
11 my daughter's a third grader in Joanna's class.

12 First, I would like to express OTA's  
13 strong support for the CACS's efforts to  
14 eliminate the incentives to convert native  
15 ecosystems to organic production.

16 It's important that organic premiums  
17 not be the driving force behind destruction of  
18 our natural resources. However, we do believe  
19 that additional flexibility is necessary in order  
20 to enable farmers to clear land so they can  
21 expand their operation. Please consider some  
22 additional reasonable flexibility to this

1 proposal.

2 On the issue of hydroponics and  
3 container production, I want to be clear, as I  
4 thought I've been in the past. OTA supports the  
5 prohibition of hydroponics and aeroponics in  
6 organic production.

7 We would have supported the Crop  
8 Subcommittee recommendation to prohibit  
9 hydroponics at this meeting had you retained the  
10 original definition for this type of farming  
11 practice.

12 The new definition which centers  
13 around production practices -- which centers  
14 around which production practices hydroponics  
15 doesn't conform to is not a good definition.

16 In order to move this discussion  
17 forward and give USDA recommendations that can  
18 actually become regulation, we need to return to  
19 definitions that accurately describe what these  
20 systems are, not what they are not.

21 With respect to container production,  
22 I urge each and every one of you to think about

1        what are the goals that container guidelines  
2        should ensure are achieved at the farm level,  
3        presence of mycorrhizae, fostering of  
4        biodiversity and cover cropping, maintaining  
5        stable nitrogen cycles.

6                    The Crop Subcommittee, in my opinion,  
7        did not do a good job of outlining what the goals  
8        were for container production in the proposal,  
9        nor did they relate the arbitrary nitrogen  
10       requirements back to those goals. How can we be  
11       sure that 20 percent limit on liquid feeding and  
12       50 percent nitrogen in the pot before the crop is  
13       planted will achieve these goals when we don't  
14       know what these goals are.

15                   I encourage you to come to consensus  
16       on what the goals are for organic container  
17       producers, and urge, and use those goals as a  
18       roadmap for the standards recommendation.

19                   Some in the organic community have  
20       decided we need to have a war around this issue.  
21       I would argue however, we're a lot closer to  
22       consensus than it may appear.

1                   The Board apparently all agrees that  
2 container production should be allowed with  
3 appropriate standards, and they're working  
4 through what those standards should be. This is  
5 consensus, this should be celebrated. Bravo.

6                   MR. CHAPMAN: Thank you. Francis,  
7 Emily. Francis, go ahead.

8                   DR. THICKE: Thank you, Nate. You  
9 said you support the 2010 recommendations  
10 prohibiting hydroponic. If you have a system  
11 that's 100 percent liquid feed, would you call  
12 that hydroponic, regardless of the substrate?

13                   Suppose for example it's coconut coir.  
14 One hundred percent liquid feed, would you call  
15 that hydroponic?

16                   MR. LEWIS: Would that include, like,  
17 a dairy farm using 100 percent liquid manure for  
18 their silage? Or out of the outer crust of the  
19 Earth?

20                   DR. THICKE: Pardon me? Are you  
21 trying to give me the strong man argument here  
22 and take me off track? What I'm looking for is,

1 and you've been very unclear about this. You say  
2 you support the 2010 recommendation that  
3 recommends prohibiting hydroponics.

4 And then I'm asking you if you have a  
5 system that's 100 percent liquid feed with  
6 coconut coir, is that hydroponic?

7 MR. LEWIS: I don't really want to  
8 answer, I mean, I'm sorry. What are you trying  
9 to get at? I don't really --

10 DR. THICKE: I'm trying to get at what  
11 you mean by hydroponic?

12 MR. LEWIS: I think we need  
13 appropriate production standards for containers.  
14 And a liquid feeding, I think it has to do with  
15 where and what the product is grown in. If it's  
16 in a pot, then it should be, you know, and it's a  
17 container production, it meets the container  
18 production requirements that you're trying to  
19 propose, then it should be allowed, it should be  
20 container production.

21 DR. THICKE: All right. Now, all  
22 hydroponics are done in containers, right?

1 That's a given. And so the question is if it's  
2 100 percent liquid feed, is that hydroponic or  
3 not?

4 MR. LEWIS: I don't know.

5 DR. THICKE: Okay, thank you.

6 MR. CHAPMAN: Emily?

7 MS. OAKLEY: Just a point of  
8 clarification that I don't know that I would use  
9 the word consensus on containers so much as the  
10 word compromise. I don't think that there was  
11 consensus among us that we wanted containers, but  
12 we saw that as the point of compromise. So just  
13 a point of clarification.

14 MR. CHAPMAN: Ashley?

15 MS. SWAFFAR: So yesterday we heard a  
16 lot of different back and forth about the two  
17 different models of in-soil versus hydroponic and  
18 containers and carbon. We heard a lot about  
19 that. Can you give us your opinion on that?

20 MR. LEWIS: Well, I'm not a scientist.  
21 But, I think we need to be cautious when we're  
22 looking at carbon footprints as it relates to

1 organic farming. The Organic Center did come out  
2 with a research study in conjunction with the  
3 Northeastern which showed that organic farms in  
4 general do have higher amounts of stable organic  
5 matter in their soils than conventional farms.

6 That's great research.

7 But I think it's important to also  
8 recognize that on a per-yield basis, organic  
9 farms are rarely carbon neutral or carbon  
10 positive. And so if we're going to bring carbon  
11 and climate change and carbon footprints into the  
12 discussion, I think we need to look at operations  
13 on a holistic perspective from the seed to the  
14 mouth, the whole system, and whether or not it  
15 contributes to climate change or has some  
16 mitigating effect.

17 MR. CHAPMAN: Dave?

18 MR. MORTENSEN: Yes, and I would  
19 actually take it one level higher, and that is  
20 how many people are you actually feeding. I  
21 think these comparisons of organic production  
22 acre unit estimates of production are, in my

1 opinion, meaningless because we compare for  
2 example maize production conventional to organic.

3 Meaningless. Sixty percent of the  
4 maize that's produced conventionally is used to  
5 produce ethanol.

6 MR. CHAPMAN: Dave, I need to get to  
7 questions.

8 MR. MORTENSEN: So I guess when we  
9 want to talk about sustainability, we need to  
10 look at the right numbers. That's all I'll say.

11 MR. LEWIS: I would encourage you to  
12 consider that as a research priority for the next  
13 round. I think it's an important --

14 MR. MORTENSEN: Yes, I agree that it's  
15 an important priority.

16 MR. CHAPMAN: Joelle?

17 MS. MOSSO: Nate, I'm curious with the  
18 OTA's communication networks with consumers, I'm  
19 going to ask that same question I've asked  
20 previously is that what is your interaction or  
21 feedback from the organic consumer community that  
22 is pulling this market forward in exponential

1 growth in regards to containerized production.

2 MR. LEWIS: That's tough. I think  
3 it's challenging. Our membership is trade, and  
4 we do interact with consumers. But I don't  
5 really want to try to say that we understand what  
6 the consumer thinks or what their perspectives  
7 are.

8 I mean, I think a lot of what's been  
9 contributed has been anecdotal, and from a  
10 particular perspective. So it's really  
11 challenging to answer that, what the consumer  
12 thinks about containers.

13 MR. CHAPMAN: Thank you. Steve?

14 MR. ELA: You've completely confused  
15 me about your definition of hydroponics now.

16 MR. LEWIS: Okay.

17 MR. ELA: Could you give me your  
18 definition?

19 MR. LEWIS: It's in the 2010  
20 recommendation, the production of terrestrial  
21 vascular plants in an inert media with, you know,  
22 soluble nutrient solution, something like that.

1                   MR. ELA: And you're going to say that  
2 coconut coir is not inert?

3                   MR. LEWIS: I would say that the  
4 containers that are producing organic crops  
5 currently are not inert media. Correct.

6                   MR. ELA: I think you're hitting the  
7 nail on the head that it's hard to define.

8                   MR. LEWIS: Right, and I guess --

9                   MR. ELA: Even your clear definition  
10 is not very clear.

11                   MR. LEWIS: It's hard to define. But  
12 I would also say that I don't know that we need  
13 to necessarily capture every single thing that we  
14 don't want to have in organic in a definition and  
15 then prohibit it.

16                   We don't say conventional dairy  
17 farming is defined as everything that doesn't  
18 meet the organic standards, and that is a  
19 prohibited practice. We define what the  
20 practices are that are required for organic dairy  
21 farming, and if you don't meet those, you can't  
22 be organic. Does the parallel make sense sort

1 of? I don't know, it's challenging.

2 MR. CHAPMAN: Francis, and we'll end  
3 it there.

4 DR. THICKE: Exactly what we did, we  
5 defined container production that would be  
6 allowed, and then we said what doesn't meet that  
7 standard is not allowed.

8 MR. LEWIS: I understand that.

9 MR. CHAPMAN: Thank you, Nate. Up  
10 next is Rex Kittle. Is Rex Kittle here? Seeing  
11 no Rex Kittle, we'll move on to Phil LaRocca.  
12 And then Kelly Damewood after Phil.

13 MR. LAROCCA: Good morning, my name is  
14 Phil LaRocca, I'm the owner and winemaker of  
15 LaRocca Vineyards. I'm also the Chairman of the  
16 Board of Directors for CCOF. I will be starting  
17 my 45th year as an organic farmer, being first  
18 certified in 1975.

19 I attended probably every NOSB meeting  
20 for the first seven years of your inception. I  
21 cannot tell you how many meetings I've been to.  
22 My crusade was to try to at least limit or try to

1 keep out synthetics in organic.

2 It was very clear cut for me. This  
3 issue on hydroponics is extremely tearing me  
4 apart because I have friends -- first of all, I  
5 understand both arguments on both sides. I have  
6 friends on both sides of the issue, and I respect  
7 the farmers on both sides of the issue.

8 I am hoping that we can come up with  
9 some kind of compromise and resolve this, and  
10 move on. As wearing my CCOF hat, I am proud that  
11 our board is made up of all farmers, except for a  
12 processor seat. So I'm also here to protect our  
13 farmers.

14 And whether the NOP made a mistake or  
15 not, we do have 108 farmers that were certified  
16 hydroponic organic. A lot of these are not large  
17 growers, they are small growers and we would  
18 destroy them economically.

19 I think that we are not the Monsanto  
20 of the world where we go out and pollute our  
21 neighbor and don't give a damn about it. There  
22 has to be some compassion in this industry, so we

1 need to come up with some sort of compromise.

2 Our compromise that we are throwing  
3 out at CCOF is total disclosure, labeling. Let's  
4 label it and make the consumer decide. I totally  
5 disagree with somebody earlier that didn't put a  
6 lot of emphasis on the consumer.

7 None of us in this room would be here  
8 if people weren't buying organic products. So  
9 the consumer is the X factor. And many years ago  
10 at CCOF, we ran a study, who bought organic. And  
11 roughly it was women between the ages of 28 to  
12 55, well educated, and I want to emphasize that,  
13 well educated, felt that it was healthier for  
14 them.

15 About 60 percent had children and said  
16 they felt that buying organic was both healthy  
17 for them and their family. And the one thing  
18 that was consistent across the board when asked -  
19 - at that time, I should add that it was 30 to 33  
20 percent more expensive to buy organic over  
21 conventional.

22 And all of these people that took the

1 study said we are willing to pay the extra money  
2 as long as it is organic. By God, it had better  
3 be organic. So make total disclosure on the  
4 label. You don't need a PC code to tell people  
5 it's hydroponic.

6 Put it on the label that people read  
7 it, and let the consumer, the organic consumer  
8 decide whether they want to buy it. And that  
9 will dictate whether hydroponics or containers  
10 exist or not, whether the consumer goes out and  
11 affords it. Thank you.

12 MR. CHAPMAN: Thank you, Phil.  
13 Francis?

14 DR. THICKE: Thank you, Phil. Now  
15 when you take your CCOF hat off, what do you  
16 think personally? Do you think hydroponics is  
17 organic?

18 MR. LARocca: I do. I truly do. As  
19 long as the standards are followed closely that  
20 organic ingredients, and for example, I know one  
21 hydroponic grower, it took him two and a half  
22 years to come up with an organic solution before

1 they even started their greenhouses and planted  
2 in it.

3 I got to be honest with you, when I  
4 was first asked to speak on this, I was shocked.  
5 I didn't realize that this was going to be so  
6 controversial. I think that most of the people  
7 that we know, especially the smaller growers, are  
8 already labeling it certified organic hydroponic.

9 So I think, you know, we have a  
10 tendency to dumb down the organic consumer. And  
11 the organic consumer is not dumb. I think we  
12 have a little higher consciousness than most  
13 people think we have.

14 I consider myself an organic consumer  
15 as well. And I do read the label of everything I  
16 buy, organic or not organic.

17 MR. CHAPMAN: Asa?

18 MR. BRADMAN: I'm just curious to hear  
19 more about how the Board interacted, and whether  
20 there was I guess bifurcation or, you know, how  
21 was it that the vote developed?

22 MR. LAROCCA: The vote, it was very

1       tight. We had a lot of our farmers that totally  
2       believed in it. So I should add that I grow in  
3       soil, and I probably spend the first 25 years of  
4       my organic cultivation developing my soil. So I  
5       totally believe in that.

6               I think the change came on our board  
7       when we talked about labeling. And then it  
8       became a pretty good majority that agreed if it's  
9       labeled, we can go on with this for a lot of our  
10      vegetable growers in particular.

11             MR. BRADMAN: Have you talked about  
12      this with other certifiers in the country?

13             MR. LAROCCA: I have not. You know,  
14      from this NOP, I sit on the Board of Directors on  
15      the farm side. So there's a firewall between us  
16      and our certification side. So I try to go along  
17      with what the organic farmer wants, and try to do  
18      everything I can to protect them.

19             That's why I feel it important for me  
20      to be here because we do have these 108 growers  
21      that have been operating with certification. And  
22      what are we going to do with these guys? I don't

1 think that this organic community can just throw  
2 them out on the street. I personally know we  
3 will devastate economically several of our  
4 growers.

5 MR. BRADMAN: Can I have a follow up  
6 question? So you said you believe hydroponic is  
7 organic.

8 MR. LAROCCA: I do.

9 MR. BRADMAN: So can you explain that  
10 and why, what are the outcomes that make it  
11 organic?

12 MR. LAROCCA: Well, I personally  
13 understand the concept of soil. But when all  
14 this started, in our tasting room, and I am  
15 organic so a lot of my customers come because I  
16 have an organic wine.

17 But I would say 40 percent are just  
18 off the street wanting to taste wine. So we ran  
19 a little survey of what people thought was  
20 organic. Most of them said they don't want  
21 synthetic pesticides and chemicals in their food.  
22 That's how most of your organic consumers.

1                   So I think if a hydroponic or a  
2 container grower comes up with an organic system  
3 that truly is organic and make the rules as  
4 strict as possible. You know, no lenience. Make  
5 it as strong as any organic farmer has to follow  
6 that's growing in soil and follow it.

7                   So if they're using inputs that are  
8 qualified as organic, then label it an organic  
9 system and a hydroponic system. So you go to a  
10 grocery store, I'll use myself as an example.

11                  If I go to a store and I'm going to  
12 buy basil, if basil is grown in soil, I'll  
13 probably buy that first. But if I have a choice  
14 between conventional basil and basil grown  
15 organic hydroponically, I'll buy the hydroponic  
16 one.

17                  MR. CHAPMAN: Thank you, Phil. So I  
18 have Dan, then Sue, and I have a question. No,  
19 Phil. Phil, Phil, Phil, come back. I'm just  
20 saying thank you to try to cut it off.

21                  MR. LAROCCA: Oh, I thought you said  
22 thank you to go.

1           MR. CHAPMAN: Succinct, succinct is  
2           the key words here. I have Dan, then Sue, then  
3           myself and we'll have to end it there.

4           DR. SEITZ: You mentioned the  
5           potential hardship to hydroponic operations if we  
6           did not have a organic hydroponic standard.  
7           Yesterday there was someone who testified, I  
8           gather the owner of a large chain of natural  
9           grocery stores, who said that he has seen harm to  
10          conventional, I mean to organic soil based  
11          growers in terms of the crops that they sell to  
12          the stores because they've been supplanted by the  
13          year round hydroponic operations.

14          So I'm just wondering if it's fair to  
15          say that no matter what decision we make, there  
16          is likely to be some economic hardship in that  
17          sector of the organic industry?

18          MR. LAROCCA: That's true. But I  
19          think the labeling may differentiate that, as I  
20          explained from my own buying power. I think  
21          right now a lot of hydroponic people are not  
22          labeling their stuff. So the consumer doesn't

1 know.

2 DR. SEITZ: Right. That may be one  
3 way to at least level the playing field somewhat  
4 so to speak. Yes. Great, thanks.

5 MR. CHAPMAN: Thank you. Sue?

6 MS. BAIRD: I hear this back and  
7 forth, and --

8 MR. LAROCCA: Right there with you.

9 MS. BAIRD: And we will continue to  
10 hear this back and forth. You're a wine maker,  
11 correct?

12 MR. LAROCCA: Correct.

13 MS. BAIRD: And this is a just if. If  
14 you had some container or hydroponic competition,  
15 would you feel different?

16 MR. LAROCCA: No, and I'll tell you  
17 why, because I am competing against, I'm from  
18 California. Our minimum wage is \$15 an hour. We  
19 have to pay overtime to our employees, we have to  
20 play lunch and breaks. And I am competing  
21 against organic wines coming in from Chile where  
22 they pay \$4 a day for their labor. I just got to

1 step up my game to compete.

2 MR. CHAPMAN: Thank you. Phil, I have  
3 some questions as well, two I think. So I'll try  
4 to keep it brief. First of all, you mentioned  
5 that your board is primarily farmers, one  
6 processor. You guys, you have been one of the  
7 few in-ground soil commenters who supported a  
8 concept of organic hydroponics of some form.

9 And I've also though read critiques  
10 that your board is made up of hydroponic farmers.  
11 Can you speak a little bit of the make-up of your  
12 board just to set that right.

13 MR. LAROCCA: We have one hydroponic  
14 farmer on the board.

15 MR. CHAPMAN: And everyone else is in-  
16 ground soil?

17 MR. LAROCCA: Everybody else is in-  
18 ground. We do have a dairy producer.

19 MR. CHAPMAN: Okay. And the number of  
20 your board members?

21 MR. LAROCCA: I think there's 16 of  
22 us.

1                   MR. CHAPMAN: Sixteen. And they, how  
2 are they selected?

3                   MR. LAROCCA: We are broken up into  
4 chapters. So you are nominated by your chapter  
5 to be a board rep. And then you get voted on  
6 from the board itself.

7                   MR. CHAPMAN: So it's 16 members  
8 representing chapters across --

9                   MR. LAROCCA: California.

10                  MR. CHAPMAN: -- California.

11                  MR. LAROCCA: And we have one Mexico  
12 chapter.

13                  MR. CHAPMAN: One Mexico chapter. And  
14 then can you speak, we've heard a lot from  
15 northeastern in-ground soil production. And  
16 you're one of the few probably western in-ground  
17 soil production folks out here.

18                  Do you think that the regional  
19 differences in organic somewhat play into this  
20 debate?

21                  MR. LAROCCA: I do think that  
22 economics is involved on the east coast, where I

1 do believe these people believe in the soil based  
2 system, I do think there's a level of economics,  
3 and I see nothing wrong with that. You're trying  
4 to make a living on your farm.

5 So if you see competition from the  
6 outside -- I mean, we suffer all the time from  
7 imports from South America in particular. But we  
8 just figure we just got to step up our game. I  
9 don't know what else to say on that level.

10 MR. CHAPMAN: Thank you. And then one  
11 last question. I know you tried to clarify this  
12 earlier, but I've read you see -- CCOF is a  
13 certifier of hydroponic operations, so they have  
14 a financial vested interest in it.

15 I understand there's three CCOF's, the  
16 CCOF Trade Association, the CCOF Certifier, and  
17 the CCOF Foundation. Can you clarify which CCOF  
18 you're representing?

19 MR. LAROCCA: The CCOF Incorporated.  
20 We are the Board of Directors. I am also  
21 involved with the foundation side, but we don't  
22 really have any involvement with certification.

1           We did originally, and then when the  
2 rule was proposed, which I always objected to,  
3 it's basically a firewall, it was felt that  
4 organic farmers couldn't regulate themselves in  
5 certification. There may be a conflict of  
6 interest.

7           But I always argued that the law board  
8 is made up of lawyers, the realtor board is made  
9 up of realtors, and the medical board is made up  
10 of doctors. But we can't have certifiers. So  
11 we're operating in a pretty good fashion.

12           We do have a lot of opportunity to do  
13 outreach and research. And I think we're pretty  
14 much in tune, at least correct with California,  
15 and no offense to the East Coast, but we do grow  
16 about 70 percent of your organic goods come from  
17 our state.

18           MR. CHAPMAN: Thank you, Phil.

19           MR. LAROCCA: You're welcome.

20           MR. CHAPMAN: Up next is Kelly  
21 followed by Pat Kerrigan. Pat, is that Pat?  
22 Okay, Pat's here, I see Pat. Kelly, if you can

1 start with your name and affiliation for the  
2 record.

3 MS. DAMEWOOD: I'm Kelly Damewood with  
4 -- Policy Director for CCOF. Given that we work  
5 with thousands of organic producers, it's quite  
6 challenging to take a hard and fast position on  
7 tough issues but our position on hydroponics is  
8 clear. CCOF does support strong standards for  
9 hydroponic in container systems. As you just  
10 heard, that is our position as adopted by our  
11 Board of Directors who have a range of opinions  
12 on this issue.

13 Given our position, we oppose the  
14 subcommittee's proposal. Rather than propose  
15 strong standards, it would create arbitrary  
16 overly prescriptive requirements. An  
17 unachievable standard is not a compromise as a  
18 means to an end. It's a means to eliminate a  
19 swath of producers using a certain type of  
20 production system from organic certification.  
21 Some can jump through hoops and comply, but why?  
22 It's not going to better their crops. It's not

1 going to further distinguish them from  
2 conventional and it's not going to make them  
3 magically mirror in-ground production.

4 Yes, what CCOF is saying is we  
5 completely recognize that this is a new and  
6 different production system but what we are also  
7 saying is that's okay, we can make room. Because  
8 at the end of the day, hydro is not the enemy of  
9 soil and soil is not the enemy of hydro. At the  
10 end of the day, it's not just soil health for the  
11 sake of soil health. At the end of the day, our  
12 ultimate goal is nutritious food grown without  
13 harmful inputs and practices.

14 And at the end of the day, whether we  
15 like it or not, USDA organic certification is the  
16 chance to transform our food system. There will  
17 never be a comparable federal investment and a  
18 transparent robust democratic certification  
19 process.

20 As such, we strongly urge the Board to  
21 reconsider the proposal and consider the draft  
22 standards that we proposed to the Board. We

1 believe these would bring consistency and clarity  
2 to the certification of these new and evolving  
3 systems, but of course would welcome the  
4 opportunity to refine and expand upon these  
5 standards.

6 Most importantly, please consider our  
7 labeling proposal. While we do believe we can  
8 make room for these systems, they are different  
9 and we should label them as such to bring  
10 transparency to the consumer. A label may help  
11 bridge this deep philosophical divide so that we  
12 can stop pitting growers and organizations and  
13 individuals against one another. It's radical  
14 but CCOF believes in a world where organic is the  
15 norm and our hope is respect and working together  
16 to achieve that goal. Thank you.

17 MR. CHAPMAN: Thank you. Francis?

18 DR. THICKE: Thank you, Kelly. I  
19 studied your standards and tell me if I'm wrong  
20 but you defined hydroponics as container growing  
21 and so you do not have any requirement for  
22 labeling hydroponics. Anything can be labeled

1 container -- as a matter of fact, I believe  
2 aeroponics is also defined as hydroponics, which  
3 is container growing, so you basically will allow  
4 aeroponics, hydroponics without labeling them as  
5 such, calling them container growing. Is that  
6 right?

7 MS. DAMEWOOD: Yes, thanks for that  
8 question. We don't have a position per se on  
9 aeroponics. I don't think we know enough about  
10 these systems. I think the real question would  
11 be, well what makes them substantially different  
12 from hydroponics that we could not support them?  
13 Yes, in our mind, the most important factor is  
14 not defining hydroponics as separate from  
15 container. You know, all hydroponics are  
16 containers, not all containers are hydroponics.  
17 As you all know, trying to draw the fine line  
18 between hydroponics and containers is quite  
19 challenging.

20 So yes, from our mind, everything can  
21 be defined as container and what we're proposing  
22 is to leave it up to the producer to either label

1 as hydroponically grown or container grown. So  
2 they must choose one of those labels and if that  
3 can be clarified in the standard, we should do so  
4 and we are certainly not opposed to a discussion  
5 about if we can get to a clear definition of  
6 hydroponic, then having a clear sect that must  
7 label as hydroponic and not choose.

8 DR. THICKE: But there does seem to be  
9 a loophole in that because it says that you must  
10 include an eligible production statement and then  
11 give examples that may include container grown,  
12 hydroponically grown, aquaponically grown. It  
13 does not say that you must use one of those. You  
14 can use any other apparently -- any other kind of  
15 eligible production statement, which you may come  
16 up with according to --

17 MS. DAMEWOOD: So this is a draft  
18 standard and that's exactly the feedback we need  
19 because we need to fix that language because we  
20 are saying you must label as either  
21 hydroponically grown or container grown or  
22 aquaponically grown, which is obvious -- it's not

1 hard to distinguish that one. So thanks.

2 MR. CHAPMAN: All right, I had Sue,  
3 then Ashley. Asa, were you raising your hand or  
4 not? Okay. Then Harriet, then Asa, then I'm  
5 cutting it off. Sue.

6 MS. BAIRD: Yes, we have discussed as  
7 the NOSB that you should limit the amount of  
8 nutrients in the container to 20 percent from  
9 liquids and stuff and then you have to use 50  
10 percent whatever. So, I'm trying to compare that  
11 to soil-based production. Do you have those kind  
12 of limitations to your production in Arizona or  
13 other places that may not have the types of soils  
14 we do in the Midwest or Northeast. Do you limit  
15 the amount of --

16 MS. DAMEWOOD: We don't have any such  
17 limitation on in-ground production.

18 MS. BAIRD: Do you even ask those  
19 questions?

20 MS. DAMEWOOD: The percentage that  
21 there of --

22 MS. BAIRD: Using with inputs that

1 goes through drip lines or whatever, whatever  
2 that's not --

3 MS. DAMEWOOD: No limit --

4 MS. BAIRD: -- inerrant soil?

5 MS. DAMEWOOD: It's my understanding  
6 that there's no specific limitation on liquid  
7 inputs, however you define liquid inputs.

8 MS. BAIRD: I don't find that in the  
9 rule either. I just wondered.

10 MR. CHAPMAN: Thank you.

11 MS. BAIRD: Okay, thank you.

12 MR. CHAPMAN: Ashley?

13 MS. SWAFFAR: Thanks for your  
14 comments, Kelly. We've heard a lot of folks talk  
15 about hydroponic growers as very large growers  
16 and I know that Phillip said you have 108  
17 hydroponic growers that you certify. Can you  
18 tell us about the size and about the percentages?

19 MS. DAMEWOOD: Sure. So, you know,  
20 give or take probably over 100 to some -- I think  
21 the highest we've had would be up to 130. And  
22 again, it's not for us, the most important factor

1 is not distinguishing hydroponic from container.  
2 I think a lot of people question when you're  
3 saying container, do you really mean hydroponic  
4 and so we kind of encompass them all as  
5 container.

6 I would say if you're thinking on --  
7 and so that the range from classic, you know  
8 roots in water to substrate container production.  
9 That sort of classic roots in water, there's  
10 probably around 10 and they are most definitely  
11 very small scale family growers.

12 MR. CHAPMAN: Thank you. I've got  
13 Harriet, then Asa.

14 MS. BEHAR: So as a shock to most --  
15 many people, I grow in containers; however, I do  
16 no liquid feeding whatsoever. I grow in rain  
17 gutters that are suspended in my earth-bermed  
18 solar greenhouse that doesn't need any heat  
19 except when it goes below 10 below zero at night.  
20 So I grow lettuce and spinach and I get about  
21 four cuttings through the winter and then I  
22 compost the leftovers.

1           So we were trying to define what's in  
2 a container, so not all containers are hydroponic  
3 --

4           MS. DAMEWOOD: Exactly.

5           MS. BEHAR: -- so we were trying to  
6 put it to the liquid feeding. So that's just  
7 information.

8           And then the other -- the question I  
9 have for you is about bringing in a new system  
10 and looking at the Organic Food Production Act  
11 and the regulations and all the things that are  
12 there that really do have so much of a tie to  
13 ecosystem improvement and soil improvement. How  
14 do you then deal with that in your certification  
15 when they fill out the organic system plan? Is  
16 it just not applicable, not applicable, not  
17 applicable?

18           MS. DAMEWOOD: Thanks and I think it's  
19 a -- at first, it's really important to recognize  
20 if you're growing in a container system, if we  
21 were to pursue a container grown labeling  
22 requirement, we may need to distinguish, you

1 know, when would you have to label as container.  
2 That is a concern of mine, you know, to  
3 distinguish, you know, because is the system, you  
4 know, using the same kind of production system  
5 science as in-ground production as classic  
6 organic. So that's an aside and something I  
7 think that is worth considering.

8 Our container growers are not absolved  
9 of the organics -- certain parts of the organic  
10 standards as has been expressed in the past.  
11 They are equally held to all the same  
12 biodiversity, natural resources, conservation  
13 requirements. Their OSPs are just as long, if  
14 not longer and they -- you know, it's still an  
15 evolving production system, I would say and so I  
16 think people are still figuring out what's the  
17 best type need, you know, landscape fabric  
18 between the containers or tilling and there's a  
19 wide range of factors. But they are held to all  
20 those same standards.

21 There is biodiversity, there's  
22 heteros. There's a lot of the same features that

1 you see on the in-ground production and a lot of  
2 them have both in-ground and container production  
3 and it's just one piece of their overall system.

4 MR. CHAPMAN: Thank you. Asa.

5 MR. BRADMAN: So I have in front of me  
6 opened the 2010 recommendation and I can see how  
7 this can be a little confusing. There's the  
8 recommendation and there's the preamble and the  
9 recommendation seems to leave room for the  
10 proposal that you're suggesting. But I want to  
11 see if you can comment on how your proposal is --  
12 how it imports with the 2010 regulations?

13 MS. DAMEWOOD: Well, you know, I  
14 honestly --

15 MR. BRADMAN: Recommendations, sorry.

16 MS. DAMEWOOD: Yes. No, I think it's  
17 a great question. I'd be happy to do a side by  
18 side analysis and submit it to the full Board  
19 after the meeting.

20 I mean, basically I think what we're -  
21 - looking at the 2010 recommendation, you know,  
22 over the past seven years, a lot has changed and

1 evolved in container production systems and their  
2 ability to cycle nutrients, not rely on -- you  
3 know, the ability to create, you know, solutions  
4 using all organically-approved materials and so I  
5 think -- like, looking at the state of the sector  
6 today, what are the standards that distinguish  
7 them from conventional container production?

8 I think -- to be clear, what I'm  
9 saying is I think to this point, there's been  
10 this real effort to find that magic number, that  
11 magic standard or definition that is going to  
12 make these new production systems sufficiently  
13 organic enough in the classic sense of growing,  
14 you know, the original organic method that is all  
15 about the soil.

16 And what I'm saying is CCOF recognizes  
17 that, you know, these systems, some people are  
18 growing container systems that I would say would  
19 align with that, but these new systems we're  
20 talking about are different and it's not in that  
21 classic method and we're saying that's okay if  
22 they can meet the organic standards and we should

1 continue to refine how they are differentiated  
2 from their conventional counterparts if that  
3 makes sense.

4 So I think the 2010 was really more  
5 about trying to define the kind of systems that  
6 do sufficiently mirror the classic organic  
7 method.

8 MR. CHAPMAN: Thank you. Thank you,  
9 Kelly. We're going to have to move on. Thank  
10 you. Up next is Pat Kerrigan, followed by Julie  
11 Weisman. Pat, if you can start with your name  
12 and affiliation for the record.

13 MR. KERRIGAN: Good morning. My name  
14 is Pat Kerrigan. I'm with Organic Consumers  
15 Association. I'm testifying today to urge the  
16 NOSB to honor the crops subcommittee compromise  
17 hydroponics proposal and along with recommending  
18 that the Board members and certifiers do all they  
19 can do to ensure that the regulatory process that  
20 gets put into place is astringent and fraud-proof  
21 as possible.

22 Since OCAs founding, we've been

1 aligned with hard working organic farmers and  
2 ranchers who do the right thing, providing  
3 consumers with safe and nutritious food, treating  
4 workers with dignity, raising animals humanely  
5 and responsibly stewarding the land that sustains  
6 all of us.

7 With our first campaign back at the  
8 end of this last century, we helped to  
9 successfully lead the charge against the USDA  
10 proposed rule, which would have allowed GMOs,  
11 irradiated foods and sewage sludge to be  
12 certified as organic. We held the line against  
13 those initial threats to organic integrity.

14 NOSB members, I'm asking you to do  
15 your part in holding the line against the threat  
16 posed by hydroponics to soil based organic --  
17 real organic farmers.

18 How disturbing that organic farmers  
19 now use the term soil organic as a qualifier and  
20 how tragic that these farmers who provide the  
21 foundation of the organic industry are facing a  
22 rapidly growing threat to their survival from

1 hydroponic producers that are more factory than  
2 farm, feeding plants instead of feeding the soil  
3 and who are cashing in on the integrity and  
4 consumer trust that these soil farmers have  
5 worked so hard to build. Seventeen thousand  
6 seventy-one people have signed our petitions  
7 standing with real organic farmers and to keep  
8 the soil in organic coalition and opposing soil  
9 as crop production systems and organic.

10 As we've stated in our hydroponics  
11 petition, the push for soilless organic is just  
12 another way for big business to further  
13 industrialize organic and marginalize the family  
14 farmers who use traditional organic farming  
15 techniques.

16 Organic consumers in the U.S. are just  
17 now learning about the hydroponic bait and switch  
18 but have no way of knowing whether the  
19 organically labeled produce on retail shelves  
20 across the country is actually grown in the soil  
21 or is in fact hydroponic.

22 And this consumer fraud is taking

1 place on a larger and larger scale as hydroponic  
2 industry scales up. Shouldn't the organic  
3 consumers have the right to know whether the food  
4 they're purchasing is produced by real organic  
5 farmers or full organic factories.

6 Also when unknowingly purchasing  
7 watered down hydroponic produce, these consumers  
8 are being fooled into believing that with the  
9 premium price they're paying, that they are  
10 receiving the very most nutritious foods and  
11 contributing to their family's health and  
12 contributing to a healthier environment.

13 MR. CHAPMAN: Thank you, Pat.

14 MR. KERRIGAN: Thanks for your time.  
15 Thank you for answering. Thank you --

16 MR. CHAPMAN: Any questions?

17 MR. KERRIGAN: -- for your hard work  
18 on this.

19 MS. MOSSO: Hi. I had a question. In  
20 regards to the survey that you put out through  
21 your members, I'm curious --

22 MR. KERRIGAN: It wasn't a survey. It

1 was a petition.

2 MS. MOSSO: Petition. What was the  
3 petition's question?

4 MR. KERRIGAN: What was the petition's  
5 what?

6 MS. MOSSO: What was the question that  
7 they could sign to, that had to identify --

8 MR. KERRIGAN: To join -- keep the  
9 soil in organic and soil farmers in opposing  
10 soilless systems as being certified as organic.

11 MS. MOSSO: They included all of that?

12 MR. KERRIGAN: It was hydroponic  
13 focus. I think we mentioned aeroponic, aquaponic  
14 but it was primarily hydroponic focus.

15 MS. MOSSO: Thank you.

16 MR. CHAPMAN: Dan.

17 DR. SEITZ: So from some testifiers,  
18 we've heard about small scale hydroponic  
19 operations. From you, we're hearing about large  
20 corporate size hydroponic operations. I have no  
21 idea what the landscape is in the hydroponic  
22 production world. Do you have any information on

1 whether the majority of produce is coming from  
2 very large scale or is that just an emerging  
3 sector and right now it's small scale? Can you,  
4 do you have any way of characterizing that?

5 MR. KERRIGAN: Well it seems to be  
6 rapidly emerging. Just from the online NOSB  
7 testimony that I follow, then also the past  
8 several in-person NOSB meetings where hydroponics  
9 is the most controversial and has had the bulk of  
10 the comments, there's a lot of producers --  
11 hydroponic producers talking about how many staff  
12 that they employ and that makes me think that --  
13 just hearing the number of comments from large  
14 producers that in fact, we are looking at large  
15 scale hydroponic production.

16 I think they like to talk about small  
17 scale producers in minimizing the potential  
18 threat to soil health farms but just the fact of  
19 the number of soil farmers -- farmers -- this is  
20 one of their busiest times of the year and they  
21 are here. They took time out of their week, are  
22 paying for their hotels. They are here to

1 testify. That shows me clearly and I hope it  
2 shows you that this is a critically important  
3 issue for soil farmers i.e. real organic farmers.

4 MR. CHAPMAN: Thank you.

5 MR. KERRIGAN: Thank you.

6 MR. CHAPMAN: Up next, we have Julie  
7 Weisman, followed by Cameron Harsh. Julie, if  
8 you can start with your name and affiliation for  
9 the record.

10 MS. WEISMAN: Associate Deputy  
11 Administrator Tucker, Chairman Chapman, members  
12 of the Board, my name is Julie Weisman. I'm  
13 speaking today as a representative of Elan  
14 Incorporated and Flavorganics LLC, not about  
15 hydroponics. I am also a past member of this  
16 Board. I served on the NOSB from 2005 to 2010,  
17 during which time I chaired the Handling  
18 Committee and served as both Vice Chair and  
19 Secretary of the Board.

20 So first, I want to thank all the  
21 Board members for your service to the organic  
22 industry. I know firsthand the sacrifice of work

1 life balance that is being demanded of you.

2 Elan is a producer of organic and  
3 nonorganic flavor ingredient, especially organic  
4 vanilla. Flavorganics is a national brand of  
5 certified organic flavor products for home use.  
6 Along with our affiliate, Natural Flavors, we've  
7 been making certified organic flavors for 20  
8 years now.

9 The first of the two items I want to  
10 address really is directed at the program but I  
11 want to make sure that my concern is heard by  
12 all. I'm in search of the lost annotation change  
13 to the listing of flavors nonsynthetic on 605A.

14 The Organic Trade Association  
15 submitted a petition to add commercial  
16 availability language to the annotation to the  
17 listing of flavors on 605A, which -- the position  
18 which requires no requirement for organic flavors  
19 to be used in organic products.

20 My companies were signatories to this  
21 petition. It was passed by the full Board at the  
22 fall 2015 meeting in Stowe, Vermont. At the same

1 meeting, they passed the renewal of flavors on  
2 the national list. It was supposed to be a  
3 package deal. Of course, I was glad to see that  
4 the proposed and then final rule that re-listed  
5 flavors on 605A but the annotation is missing in  
6 action and is needed to support the growth of  
7 certified organic flavors and increase the  
8 organic composition of the many organic products  
9 in which they're used.

10 I'm disappointed to see no evidence  
11 that rule making has been initiated and would  
12 appreciate some indication of when that might  
13 begin.

14 I also want to give a shout out for  
15 the renewal of the handling materials up for re-  
16 listing. Not all are used directly by my company  
17 but all are used if not by me, then my ingredient  
18 suppliers or in the products which also use my  
19 organic products as ingredients.

20 Flavorganics directly uses  
21 diatomaceous earth. We could not make our  
22 Flavorganics syrups clear without them.

1 Attapulgit also is required to clarify the  
2 organic citrus and mint oils, which are starting  
3 materials for Flavorganics extracts. Sodium  
4 bicarbonate, potassium acid tartrate are vital to  
5 the many baked products that use Elan's organic  
6 vanilla extract and sodium carbonate is needed in  
7 dairy and chocolate products that use Elan's  
8 organic vanilla.

9 Carbon dioxide is essential for a  
10 nonvolatile method of extraction used for vanilla  
11 and other botanicals and spice oils. Then  
12 chlorine materials are the best and most widely  
13 used tools for sanitation in organic operations.

14 In handling, we have a very limited  
15 tool kit to bring organic products to consumers  
16 in a form that they can recognize and use easily  
17 so please renew them. Thank you.

18 MR. CHAPMAN: Thank you Julie. Thank  
19 you. Up next is Cameron Harsh followed by Kiki  
20 Hubbard.

21 MR. HARSH: Good morning. My name is  
22 Cameron Harsh with Center for Food Safety. As

1 always, we appreciate the opportunity to  
2 participate in this robust, transparent process  
3 and support the crucial role of NOSB in assuring  
4 organic integrity and fostering continuous  
5 improvement.

6 CFS supports the crops subcommittee's  
7 intent to prohibit aeroponic, hydroponic, and  
8 aquaponic systems that eliminates soil and rely  
9 exclusively on liquid nutrients. Such systems  
10 cannot comply with OFPA or the organic  
11 regulations, which require maintaining and  
12 improving soil health, natural resources and  
13 biodiversity within an organic operation.

14 CSF supports clear differentiation  
15 between excluded hydroponic systems and container  
16 systems that may comply with OFPA and be eligible  
17 for certification. The proposal to establish  
18 caps on total nitrogen supplied in liquid form  
19 and the amount that may be applied after planting  
20 appears to be a valuable strategy for ensuring  
21 containing producers are consistently building,  
22 rather than depleting the growing media.

1                   We caution the Board for moving  
2 forward without justifying the proposed caps  
3 based on OFPA, the regulations and soil biology.  
4 The organic community needs more time to weigh in  
5 on container production requirements illustrated  
6 by the need for a discussion document at this  
7 meeting.

8                   Language in the hydroponics proposal  
9 adds Section 205.209 to the regulations but must  
10 be improved before moving forward. For example,  
11 container systems should not be exempt from  
12 205.202B, which establishes a critical three year  
13 waiting period for applied prohibited substances.

14                   We support denying Synergy USAs  
15 petition on anaerobic digestate due to concerns  
16 of pathogens, antibiotic resistance and animal  
17 drug residues. Digestate must remain subject to  
18 the same harvest waiting periods as raw manure  
19 when applied to organic crop fields.

20                   We urge NOSB to pursue avenues to  
21 strengthen the definition of biodegradable,  
22 biobased mulch to ensure that only 100 percent

1 biobased and biodegradable products are allowed.  
2 The lack of existing products that meet this  
3 standard must not justify accepting materials  
4 that do not meet the high bar of organic.

5 As a research priority, NOSB should  
6 support field based research on the  
7 biodegradability of 100 percent biobased products  
8 that accounts for the high variability of site  
9 specific conditions such as ongoing research by  
10 Washington State University.

11 On marine algae, NOSB should identify  
12 species that can be harvested in an ecologically  
13 sound manner considering all ecosystem impacts  
14 from harvest beyond the ability of the target  
15 species to regenerate and prohibit species that  
16 cannot be harvested in such manner from using  
17 organic.

18 CFS submitted a brief review of  
19 available literature and urges NOSB to solicit  
20 input from and consult with marine biologists  
21 with expertise in the ecology of economically  
22 important marine species.

1           We continue to urge NOSB to develop a  
2 formal recommendation to NOP to add  
3 nanotechnology and nanomaterials to 205.105 as  
4 excluded and organic. NOPS action on nano to  
5 date has been insufficient and this strategy is  
6 the only means of assuring that nanomaterials are  
7 never allowed in organic. As more and more nano  
8 scale products gain food and farm uses including  
9 nanoscale micronutrients, it is imperative that  
10 this step be taken immediately. Thank you.

11           MR. CHAPMAN: Thank you. Emily.

12           MS. OAKLEY: Thank you for all of your  
13 research on marine materials --

14           MR. HARSH: Of course.

15           MS. OAKLEY: -- and I wanted to ask of  
16 the three possible approaches that we might take,  
17 one being listing allowed marine materials, two,  
18 prohibiting certain species or geographic regions  
19 or methods of harvest and three, applying the  
20 wild crop standard. Where would you suggest we  
21 begin?

22           MR. HARSH: Yes, that's a tough one

1 and we haven't taken a position on which would be  
2 the best strategy for ensuring that marine  
3 species that can't be harvested in an  
4 ecologically sound matter are effectively  
5 prohibited and I think it's likely a combination  
6 of strategies in terms of annotating national  
7 listings, for example agar-agar. If you find out  
8 through the research that a certain species has  
9 detrimental ecosystem impacts, then amending that  
10 to prohibit that species. But definitely we  
11 support factoring in the wild crop standard as a  
12 really good strategy moving forward initially and  
13 then as the research develops, then maybe a  
14 combination of strategies.

15 MR. CHAPMAN: Thank you. Thank you  
16 Cameron. Up next is Kiki Hubbard, followed by  
17 Lynn Coody.

18 MS. HUBBARD: Good morning. My name  
19 is Kiki Hubbard. I'm the director of Advocacy  
20 for Organic Seed Alliance. We are a nonprofit  
21 that works nationally to ensure farmers have the  
22 organic seed they need through research,

1 education and advocacy and my short comments this  
2 morning will focus on the three seeds, specific  
3 proposals and discussion documents on the agenda  
4 this week.

5 First, we're grateful that the Board  
6 remains committed to addressing the genetic  
7 integrity of seed. Through the most recent call  
8 for comments on previous discussion documents on  
9 the issue of seed purity, protecting the genetic  
10 integrity of seed used by organic growers is an  
11 ongoing challenge that we all know places an  
12 unfair burden on the organic sector.

13 Organic crop producers, seed producers  
14 and seed companies are responding to the  
15 challenges contamination poses through testing,  
16 prevention strategies and even redirecting  
17 contaminated seed lots to less valuable markets.  
18 And as we've discussed in previous comments,  
19 these practices result in burdens that go well  
20 beyond simply the cost of testing and monitoring  
21 the problem. We're committed to supporting your  
22 work on this complex issue in the months ahead.

1                   Secondly, we are very supportive of  
2 clarifying the terminology used for making  
3 determinations about which methods are excluded  
4 in organic systems. The materials in GMOs  
5 subcommittee is headed in the right direction  
6 with using a framework and refining its process  
7 for making determinations about excluded methods.

8                   The current proposal on excluded  
9 methods terminology is generally good and we  
10 support the listing of the three methods  
11 identified as excluded but before this proposal  
12 is approved, we think the subcommittee should  
13 include a definition for each of these terms as  
14 part of their formal recommendation.

15 Additionally, this proposal and all future  
16 excluded methods proposals should include the  
17 excluded methods definition itself and a clear  
18 statement with citations justifying the  
19 subcommittee's decision when they move a method to  
20 the excluded category.

21                   Lastly, as my colleague will comment  
22 on here shortly, we're very pleased to once again

1 see the crop subcommittee's proposal to strengthen  
2 NOPs 2013 Organic Seed Guidance Document. It's  
3 important to remember that supporting increased  
4 organic seed sourcing is more than just about  
5 helping organic growers meet a regulatory  
6 requirement. Much of our seed is currently bred  
7 and produced under agrochemical conditions in  
8 conflict with organic principles and with  
9 breeding goals that too often don't benefit  
10 organic farmers.

11           Alternatively, organic plant breeders  
12 and seed producers are working for organic  
13 farmers by focusing on traits that are important  
14 to low input systems such as quick emergents,  
15 weed competitiveness, nutrient use efficiency,  
16 disease resistance and more.

17           In other words, the organic community  
18 has an opportunity to create a path that's very  
19 distinct from the dominant seed industry  
20 controlled by agrochemical interest and this path  
21 is shaped by our individual decisions to choose  
22 organic seed when appropriate, to communicate

1 ongoing supply gaps to organic breeders and the  
2 seed industry and to advocate for policies and  
3 solutions to meet these needs.

4 And we all have a role to play in  
5 creating this path including you as an advisory  
6 board with this proposal that is before you.

7 Thank you.

8 MR. CHAPMAN: Thank you. Briefly,  
9 Joelle and Harriet.

10 MS. MOSSO: Just a -- over here, just  
11 a quick question. In regards to the excluded  
12 methods definitions, what would be your opinion  
13 about putting that in guidance versus regulation  
14 simply due to the fluidity of evolution and those  
15 methods?

16 MS. HUBBARD: My understanding is that  
17 is the goal that the guidance documents would aid  
18 to further clarify the excluded methods  
19 definition.

20 MR. CHAPMAN: Harriet?

21 MS. BEHAR: Hi, Kiki.

22 MS. HUBBARD: Hi, Harriet.

1 MS. BEHAR: So I was re-looking at all  
2 of the comments on the strengthening seed  
3 guidance and there was quite a few comments about  
4 the trialing mandate or -- it's not actually, not  
5 mandated but the discussion in there that we  
6 should be encouraging seed producers -- I mean,  
7 crop producers to trial, to actually figure out  
8 what is of equivalent variety and so I wondered  
9 if you could speak to that some about is there  
10 any projects or anything you're working to help  
11 there?

12 MS. HUBBARD: Yes, not only do we have  
13 some projects underway to support growers in  
14 conducting variety trials, as well as certifiers  
15 helping to better understand how they can be used  
16 as a tool for identifying varieties -- organic  
17 varieties in particular that are appropriate for  
18 the organic systems.

19 We believe that it is a very important  
20 tool to recommend, especially for operations that  
21 are not demonstrating improvement year to year,  
22 that are not taking extra measures when

1 appropriate to source organic seed. We feel that  
2 this could be one way that they demonstrate they  
3 are making improvements in their practices.

4 Organic Seed Alliance is working. We  
5 have a variety trial guide for farmers. It's 10  
6 years old. We are updating that manual in 2018  
7 and it will have a special focus this time around  
8 on articulating for growers who rely on this  
9 manual. It's one of our most popular  
10 publications downloaded by organic farmers on our  
11 website, really clarifying for them or  
12 instructing them how to use variety trials as a  
13 tool to help meet the organic seed requirement  
14 and understanding equivalency issues.

15 So a compliment to that is that we're  
16 also working on a manual, working closely with  
17 the certification community on the organic seed  
18 requirement to help identify and publish as a  
19 resource best practices for understanding and  
20 enforcing the organic seed requirement in a  
21 reasonable and measurable way so that we can have  
22 more consistent enforcement and make faster

1 progress in encouraging more organic seed usage.

2 MR. CHAPMAN: Thank you, Kiki. I have  
3 one quick question for you as well.

4 MS. HUBBARD: Yes?

5 MR. CHAPMAN: My biggest concern with  
6 the proposal as written is around the continuance  
7 improvement requirement and while on the surface,  
8 I completely agree with it, you know I work -- we  
9 buy an extensive amount of organic oats and work  
10 with organic oat growers across the U.S. and  
11 Canada, many who source organic seed but in a  
12 given year when crop production has been bad,  
13 that equally affects organic seed production and  
14 the organic seed industry is just not as robust  
15 as the conventional seed industry is, which is  
16 part of why this is trying to fix this but that  
17 would show a noncontinuous improvement if in that  
18 next year they would have to use a nonorganic  
19 seed and maybe then they'd have to be forced to  
20 choose a varietal that would not work well in  
21 their areas, that may be more prone to disease or  
22 potentially, you know, a crop that's not the best

1 economic crop for them to grow at that time.  
2 What -- do you have concerns in that area as  
3 well? What --

4 MS. HUBBARD: Yes, Tom.

5 MR. CHAPMAN: -- what's your thoughts?

6 MS. HUBBARD: I think that is a real  
7 concern. I think that the updated regulation  
8 coupled with the guidance could help provide some  
9 flexibility in those instances and so I very much  
10 encourage that because of course, at the end of  
11 the day, we -- it's no one's intent in this room  
12 to force farmers -- organic farmers to use a  
13 particular organic seed variety if it's not  
14 optimal for their system.

15 So yes, there are these unforeseen  
16 circumstances that are out of their control that  
17 might keep them from those annual improvements.  
18 Again, I think that there are ways to provide  
19 that flexibility and still move forward with the  
20 proposal with updates and improvements as we've  
21 articulated in our comments.

22 But yes, we need to be honest that

1 there is a concern but I do not think that it is  
2 a reason not to pass or propose that regulatory  
3 update. We believe that as written -- seed  
4 issues are complex and we believe that as written  
5 and honors that complexity and balances the on  
6 the ground reality with practical solutions and a  
7 practical proposal for moving forward.

8 MR. CHAPMAN: Thank you. Thank you,  
9 Kiki. We have to move on now so up next, we have  
10 Lynn Coody, followed by Abby Youngblood.

11 MS. COODY: Good morning. My name is  
12 Lynn Coody and I'm presenting comments for the  
13 Organic Producer Wholesaler's Coalition, seven  
14 businesses that distribute fresh organic produce  
15 across the United States and internationally. In  
16 our comments, we express our own ideas and also  
17 provide a conduit for the voices of the many  
18 certified growers who supply our businesses.

19 Crop materials: OPWC agrees with the  
20 crop subcommittee that both the petitioned  
21 materials should not be added to the national  
22 list. We do support re-listing all of the crops

1 sunset materials except Vitamin B1 as our growers  
2 indicated they do not need that material.

3 Hydroponics and containers: OPWC is  
4 grateful for your continued work on these  
5 difficult issues. We recognize that the lack of  
6 clear standards prior to certification of various  
7 types of ponics and container operations presents  
8 significant complexities. Some certified  
9 operations will likely lose their certification.  
10 Market share will shift for some and others will  
11 need to adapt their management practices to  
12 comply with new standards. It is clear that  
13 whichever solution is chosen, the fresh produce  
14 trade will be greatly impacted.

15 We hope our comments on this topic  
16 support the NOSBs work by providing ideas that  
17 provide middle ground between the views of the  
18 proponents of soil based systems and those who  
19 advocate for certification of all types of ponics  
20 operations. Our goal is to work toward a  
21 balanced solution that is rooted in compromise  
22 and compliance with existing crop production

1 standards and provides clear differentiation  
2 between organic and conventional production  
3 systems. We are not interested in pitting soil  
4 based growers against those who produce crops in  
5 containers. We think there are benefits to both  
6 systems when they are based on organic standards.

7 As explained in our written comments,  
8 we support the minority position as the best way  
9 forward because we believe it focuses on  
10 assessment of the outcome of all elements of the  
11 production system and it emphasizes biological  
12 interactions. Both are important organic  
13 principles. Our written comments provide eight  
14 suggestions for further development of the  
15 minority position. We urge the Board to consider  
16 these and other ideas to find a way forward that  
17 balances the needs of all stake holders.

18 Excluded handlers: We appreciate the  
19 recommendations for tightening the NOP guidance  
20 and providing additional training on managing  
21 trade with excluded handlers. The topic is  
22 critically important in preventing fraud, co-

1 mingling, and contamination in both imported and  
2 domestic supply chains.

3 OPWC strongly believes that allowing  
4 uncertified handlers creates significant  
5 exception to the standard operating procedures of  
6 the organic trade. Their exclusion from  
7 certification requires additional management by  
8 all other entities throughout the entire supply  
9 chain, as well as from certifiers and the  
10 accreditation system. Our written comments  
11 provide extensive examples of the negative  
12 impacts of excluded handlers on the produce  
13 sector.

14 Although we understand the strategy of  
15 proposing solutions to guidance, we urge  
16 continued work on a regulatory change to  
17 eliminate the handler exclusion. Thank you.

18 MR. CHAPMAN: Thank you, Lynn.  
19 Questions? I have Asa, Joelle and that's it.

20 MR. BRADMAN: First comment, I just  
21 want to thank you for your written comments. I  
22 thought they were really well done and just

1 really thoughtful and thank you.

2 MS. COODY: Thanks, Asa.

3 MR. BRADMAN: This of course goes to  
4 the issue around hydroponics and we heard  
5 earlier, a proposal for a labeling compromise  
6 that would talk about a, you know, a hydroponic  
7 or aquaponic label that could be perhaps under  
8 the NOP. How would that -- you know, I know your  
9 comments on the container proposal we have but  
10 what do you think about that as a wholesaler?

11 MS. COODY: Our group felt that we  
12 could definitely accommodate this as we do pass  
13 tremendous number of information bits about the  
14 products through the supply chain as certified  
15 handlers. So, we can definitely accommodate  
16 this. It would mean a change to each of the  
17 handlers information systems but we can do that.

18 First though, we would appreciate a  
19 clarification of the standards and an emphasis on  
20 how container production would be meeting each of  
21 the standards. After that, we view the labeling  
22 option as an additional portion of the

1       compromise, but we can do it.

2               MR. CHAPMAN:   Okay.   Thank you, Lynn.

3       I share Asa's comments in appreciating your  
4       detailed comments and I look forward to a  
5       dialogue with you as we continue to work on  
6       excluded operations.

7               MS. COODY:   Thanks, Tom.

8               MR. CHAPMAN:   Thank you very much.

9               MS. COODY:   We'd really be happy to  
10       help in the future with both excluded handlers  
11       and even containers too.

12              MR. CHAPMAN:   Thank you.   Up next is  
13       Abby Youngblood, followed by Jeff Bogusz.   Sorry  
14       Jeff.   Abby, you can start with your name and  
15       affiliation.

16              MS. YOUNGBLOOD:   Thank you, Tom.   I'm  
17       Abby Youngblood, executive director at the  
18       National Organic Coalition, and thank you, NOSB  
19       members for all that you're doing.   We really,  
20       really appreciate your service to the organic  
21       community.

22              First, we're pleased that the NOSB is

1 considering recommendations to improve oversight  
2 procedures for imports and we support the current  
3 NOSB recommendations on operations excluded from  
4 certification. They're a good starting point for  
5 addressing problems of fraud, not just with  
6 imports but also with domestically produced  
7 products and we think that it's critical that the  
8 NOSB consider ways to strengthen integrity for  
9 the entire systems, domestic and international.

10 With this in mind, we urge the NOSB to  
11 pay close attention to the oversight system for  
12 the NOPs accreditation process. We heard  
13 yesterday morning about the 2017 peer review  
14 audit and it's good that the NOP is undertaking  
15 this annual audit. This is something that's  
16 required by the organic law and regulations, but  
17 the current peer review process is falling short  
18 and a major problem is that the NOP has too much  
19 control over how the review is conducted. What  
20 we need is truly independent oversight using a  
21 risk base focus and review with assurance that  
22 the NOP will be held accountable to fix any

1 problems that are identified.

2 Second, on excluded methods, NOC  
3 supports listing agroinfiltration, cisgenesis and  
4 intragenesis as excluded methods but we strongly  
5 urge the NOSB to develop a definition for each of  
6 the terms to provide necessary clarity and we do  
7 not agree that cell fusion within a plant family  
8 is a form of cisgenesis.

9 Third, NOC urges the NOSB to support  
10 the crop subcommittee recommendation on container  
11 production as a compromised solution that allows  
12 container growing to continue when it's founded  
13 on the principle of feeding the soil, not the  
14 crop. It's important to note that highly soluble  
15 crop nutrients have been thought of as  
16 inappropriate for organic farming right from the  
17 start. This is discussed in the preamble to the  
18 NOP final rule.

19 Right now, some container production  
20 systems rely on excessive use of new and highly  
21 soluble sources of nutrients. The crop  
22 subcommittee proposal would place a restriction

1 that's consistent with the intent of the final  
2 rule and with how other highly soluble nutrients  
3 such as Chilean nitrate have been regulated.

4 And finally, I want to talk about  
5 inerts. The next step is the Memorandum of  
6 Understanding with the EPA and we urge the NOSB  
7 to work with the NOP to move this issue forward  
8 to clarify the NOSB recommendation from fall of  
9 2015. Inerts make up the largest part of  
10 pesticide products and some are more toxic than  
11 active ingredients in pesticides. As an example,  
12 nonylphenol ethoxylate or NPEs and these should  
13 be removed as quickly as possible from use in  
14 organic agriculture.

15 MR. CHAPMAN: Thank you. Questions?  
16 Asa, briefly.

17 MR. BRADMAN: I'm going to keep asking  
18 the same question here but you suggested you  
19 agree with the current container proposal and the  
20 limits on liquid feeding and I understand the  
21 arguments for that. Should there also be similar  
22 limits on use of liquid fertilizers in the field

1 and how do we evaluate for example, there's many  
2 OMRI-approved fertilizers and some are, you know,  
3 processed from soy beans, some are fish, some are  
4 --

5 MS. YOUNGBLOOD: Yes.

6 MR. BRADMAN: -- you know, how do we -  
7 - and none of them of course are, you know --

8 MS. YOUNGBLOOD: Yes.

9 MR. BRADMAN: -- mineral level so --

10 MS. YOUNGBLOOD: Well, you know, we  
11 think that there already are limits on the use of  
12 these highly soluble nutrients and you know, we  
13 go back to the preamble of the final rule and  
14 looking at, you know, if you look at the original  
15 proposed rule and the comments that NOP got on  
16 that proposed rule and how the department  
17 responded to those comments, it makes clear the  
18 intent. The intent was to limit these highly  
19 soluble nutrients. So we go back to that and we  
20 think that the certifier should already be  
21 looking at the issue and restricting dependence  
22 of a farmer on highly soluble sources of

1 nutrients and really looking at Section 205.203  
2 of the rule. Is it always happening? We know  
3 that we need to tighten that up.

4 MR. CHAPMAN: Thank you, Abby. We  
5 have to move on. Up next is Jeffrey Bogusz.  
6 Sorry, Jeff again and then Lauren Johnson. Jeff,  
7 you can start with your name and affiliation.

8 MR. BOGUSZ: So it's Jeff Bogusz with  
9 the Ferrara Candy Company. Pectin is essential  
10 to the manufacturer of the organic confectionary  
11 products that we make. The current is not an  
12 organic source of pectin so we're going to ask  
13 that you keep pectin on the national list.

14 Similarly, bentonite, diatomaceous  
15 earth, nitrogen and carbon dioxide could be used  
16 by the people who supply us our ingredients and  
17 we ask to keep a robust supply chain, you keep  
18 those items on the list as well.

19 I'm the handling side of the organic  
20 industry and I just want to take this opportunity  
21 to say thank you to every -- all the farmers.

22 I feel that we're to a certain degree,

1 organic by paperwork and it's all the farmers  
2 here that actually grow things. Thank you. And  
3 this is my third time at NOSB meeting and the  
4 tension is just so incredibly thick. It's  
5 amazing and so I've been thinking about why and  
6 so this is a model that I've seen used in terms  
7 of organizations and basically, it talks about  
8 the different steps, a pyramid from the group up  
9 to build an organization and how every step along  
10 the way needs to be congruent with every other.

11 So, you have the environment where  
12 things grow. You have the actions, how things  
13 are grown, capabilities, learning how to grow  
14 things. Then you get to beliefs. Healthy soil  
15 makes for healthy world. Things like that. In  
16 most arguments, they're usually at that belief  
17 level with one person's belief is different than  
18 another person's belief. But when it comes to  
19 organic, we really go up this chain.

20 Above that is identity and purpose.  
21 These are all so closely tied together with every  
22 different individual in this room. Everybody's

1 purpose is really tied to whether or not  
2 something's grown in the land or a container. I  
3 mean, it's not -- hopefully this provides a  
4 little bit more understanding as to why some of  
5 these issues can be so contentious.

6 Looking at it another way, if you look  
7 at the hydroponic issue. If you go to the  
8 identity level, an organic farmer has their  
9 identify based in growing things in the ground.  
10 Hydroponic growers have a different identity.  
11 It's in their name. If I look at the situation  
12 here with that regard, their purpose is  
13 relatively the same. However, at an identity  
14 level, there's the split so -- in my world, if  
15 you're going to find a compromise here, it's  
16 going to require two different labels, two  
17 different identities for the products to match  
18 the different identities for the growers.

19 Also, the question that came up  
20 yesterday was why are new farmers choosing not to  
21 get certified in organic and I think this model  
22 kind of shows two questions to ask. How does the

1 current national organic program differ from  
2 their purpose or differ from their identity? You  
3 need to go to that level and ask those sorts of  
4 questions.

5 Back to gummy bears. How are gummy  
6 bears making the earth a better place? I'm just  
7 going to add one thing here that -- maybe I  
8 won't. Okay.

9 MR. CHAPMAN: Thank you.

10 MR. BOGUSZ: All right, thanks.

11 MR. MORTENSEN: I just wanted to say  
12 thank you for the processed thought. I think  
13 that's very helpful. Thank you.

14 MR. CHAPMAN: Thank you very much. Up  
15 next, we have Lauren Johnson. Lauren Johnson  
16 followed by Dave Hiltz. If you notice, we've  
17 passed the 10:30 break time. We'll be working  
18 through our break. If members need to take a  
19 break, do it on your own as necessary. Lauren,  
20 if you could start with your name and  
21 affiliation.

22 MS. JOHNSON: Good morning. My name is

1       Lauren Johnson and I'm with the Organic Seed  
2       Alliance. We're a nonprofit that works  
3       nationally to ensure organic farmers have the  
4       seed they need through research, education and  
5       advocacy. My comments will touch on the crop  
6       subcommittee proposal, Strengthening Organic Seed  
7       Guidance.

8                 The NOSBs ongoing attention to organic  
9       seed underscores the important role that you as a  
10      Board, as well as the NOP and certification  
11      community, play in fostering organic seed  
12      systems. Developing these systems isn't just  
13      about helping certified growers meet a regulatory  
14      requirement. By investing in organic seed, we  
15      are diversifying a gene pool that gives organic  
16      farmers more tools to not only comply with, but  
17      to thrive with organic growing conditions.

18                We believe the crop subcommittee  
19      proposal is generally very strong. We support  
20      the proposed regulatory change coupled with  
21      stronger guidance for certifiers.

22                There are however, a few components of

1 the proposal that we'd like to see changed,  
2 essentially language edits that are described in  
3 our written comments before the NOSB votes. We  
4 request that the NOSB not pass this proposal as  
5 written and that the subcommittee continue work  
6 based on our written comments and those of others  
7 in this room with the hope that an updated  
8 proposal will be back on the agenda this spring  
9 for a vote.

10 As OSA shared at the spring meeting,  
11 we are developing a manual on organic seed for  
12 certifiers and inspectors with the goal of  
13 creating a resource that highlights best  
14 practices for enforcing the organic seed  
15 requirement. The end goal of such a resource is  
16 to support reasonable and measurable progress in  
17 organic seed usage. We have interviewed nearly a  
18 dozen certifiers to identify best practices for  
19 enforcement, hear their opinions of what  
20 continuous improvement looks like in the context  
21 of seed and gather ideas for addressing organic  
22 seed usage among the biggest producers.

1                   One of the points of leverage we  
2                   identified to increase organic seed usage  
3                   pertains to large producers who contract their  
4                   entire crop to a buyer. As OSAs data show, many  
5                   of these large producers are growing under a  
6                   contract or they might have a variety dictated by  
7                   their buyer, typically a certified organic  
8                   handler who is essentially exempt from any  
9                   responsibility to choose varieties that are  
10                  available organically or could be available  
11                  organically with more communication and  
12                  coordination.

13                  Even though the NOP has indicated that  
14                  it's up to certified producers to apply pressure  
15                  to their buyers in the area of organic seed, we  
16                  see it as necessary to find a way to directly  
17                  place some responsibility on certified handlers  
18                  that source seed directly for their growers or  
19                  who dictate a specific variety be grown.

20                  We encourage the Board to explore all  
21                  tools available to them to close this loophole.  
22                  Thank you.

1 MR. CHAPMAN: Briefly, Steve.

2 MR. ELA: This is brief. So you would  
3 prefer to see this go back to the subcommittee  
4 and have the language tweaked and then come back  
5 in the spring --

6 MS. JOHNSON: Yes.

7 MR. ELA: -- just to be clear?

8 MS. JOHNSON: Yes.

9 MR. CHAPMAN: Thank you. Up next is  
10 Dave Hiltz, followed by Julia Barton. Dave, you  
11 can start with your name and affiliation.

12 MR. HILTZ: Good morning and thanks to  
13 the Board and the NOP members for their service  
14 and the opportunity to comment here this morning.

15 My name is David Hiltz. I'm the  
16 director of Regulatory Affairs at Acadian  
17 Seaplants for one of the world's largest  
18 manufacturers of products derived for marine  
19 algae and we'd like to provide some comments this  
20 morning on the subject of marine materials.

21 Arcadian Seaplants appreciates and  
22 supports the ongoing efforts of the NOP and the

1 NOSB to clarify the regulatory language around  
2 marine materials. While we support the  
3 suggestion to identify products based on Latin  
4 naming, we also caution this may be a challenge.  
5 A number of psychologists who are experts in the  
6 field of marine taxonomy have commented that even  
7 they sometimes have difficulty in identifying  
8 closely related marine species. So it may be  
9 even more difficult for certifiers to complete a  
10 task like this in the field.

11 While we support the principle that  
12 sourcing and harvesting of marine materials must  
13 be conducted in a sustainable and ecologically  
14 sound manner, we continue to be deeply concerned  
15 about the comments that portray the industry in a  
16 negative light. In particular, there appears to  
17 be a misconception that the marine algae  
18 ascophyllum nodosum, which is often known as  
19 rockweed, is being widely over-harvested with  
20 little concern for the effects of the surrounding  
21 ecosystem.

22 Arcadian Seaplants would suggest that

1 the science and the facts surrounding this  
2 industry demonstrate that these statements are  
3 not accurate. Some comments suggest that the  
4 amount of ascophyllum on the shoreline is unknown  
5 and that makes harvesting plants arbitrary, but  
6 this is not accurate. Government and industry  
7 scientists use satellite photography coupled with  
8 infield measurements, which we call  
9 groundtruthing, to conservatively estimate the  
10 biomass.

11 In Maine for example, these estimates  
12 conservatively put the standing stalk of  
13 ascophyllum at approximately 500,000 tons spread  
14 over about 3500 miles of coastline. Now, the  
15 annual harvest of ascophyllum in Maine as  
16 reported by the Department of Marine Resources in  
17 2016, was approximately 10,000 tons. This amount  
18 represents less than 2 percent of the standing  
19 stalk of these species.

20 If one compares that to the amount of  
21 conservative scientific estimates of 25 percent  
22 of the biomass being naturally removed by coastal

1 storms and winter ice scour, it becomes clear  
2 that the current rate of harvest for this species  
3 is actually quite low.

4 It is also suggested that there are no  
5 regulations in place to control and monitor the  
6 harvest of ascophyllum. Again, this is untrue.  
7 Shoreline is divided into sectors with biomass  
8 estimates. Harvesters are licensed, trained and  
9 have to adhere to harvesting -- I'm sorry -- and  
10 had to adhere to harvesting restrictions and  
11 methods and landings are monitored to ensure  
12 balance to these policies.

13 For those that are not aware,  
14 ascophyllum is actually harvested by cutting the  
15 top off the plant.

16 MR. CHAPMAN: Thank you. Emily,  
17 briefly.

18 MS. OAKLEY: Thank you for coming and  
19 for giving your comments. I was wondering if you  
20 would be open to applying the wild crop standard  
21 to your harvesting methods and what your thoughts  
22 on that are.

1           MR. HILTZ: We'd have to carefully  
2 study that Emily, but yes, I believe we can. In  
3 the brief overview of the wild harvesting policy,  
4 I believe that the current ascophyllum harvest  
5 actually adheres to those policies.

6           MR. CHAPMAN: Extremely briefly,  
7 Steve.

8           MR. ELA: It seemed like in the public  
9 comments and the written comments there was a  
10 fair amount of clarity on the main, I mean, you  
11 know, the whole main harvesting of rockweed and  
12 things but worldwide, it became much less clear  
13 about the sustainable harvest. Do you have any  
14 suggestions of how we approach that difficulty  
15 and, you know, one small area may be sustainable  
16 but worldwide, it may not.

17           MR. HILTZ: I can comment from the  
18 fact that Acadian Seaplants is based in Atlantic  
19 Canada, so I can tell you that the resource has  
20 been harvested successfully for a long time, 40-  
21 50 years in Atlantic Canada. We have a detailed  
22 system in place there that works between the

1 industry and government to ensure that a  
2 sustainable harvest occurs. In other areas of  
3 the world, again, there is the same type of  
4 philosophy. Our operations in Ireland are  
5 progressing in the same direction. Ascophyllum  
6 has been harvested extensively in Norway for many  
7 years. Again, with no evidence of environmental  
8 damage there so --

9 MR. CHAPMAN: Thank you.

10 MR. HILTZ: Thank you, Tom.

11 MR. CHAPMAN: Julia Barton is next,  
12 followed by Steve Walker.

13 MS. BARTON: Good morning. My name is  
14 Julia Barton. I'm with the Ohio Ecological Food  
15 and Farm Association. OEFFA is a grassroots  
16 coalition of more than 4800 farmers, researchers,  
17 teachers of other folks working to build a  
18 healthy and sustainable food system. Our  
19 certification program certifies over 1200  
20 producers and handlers in about a 10-state  
21 region.

22 I'd like to comment on three items.

1 First, we respectfully ask that you work to add  
2 the topic of oil and gas industry infrastructure  
3 impacts on organic farms to the NOSB work agenda.  
4 In our written comments, we offered ideas for  
5 several specific ways we think the NOSB could  
6 support organic farmers by addressing these  
7 issues. We think first and foremost, it would be  
8 important to work towards getting it on the  
9 agenda and then we think creating a discussion  
10 document to unpack some of these issues would be  
11 of particular use to organic farmers.

12 Secondly, thank you for your work to  
13 create an open docket. We heard the conversation  
14 between Terry Shistar and Dave Mortensen this  
15 morning about how we might better offer support  
16 to the massive workload of the NOSB. We agree  
17 that the open docket has potential to work better  
18 if some of the meeting materials were to be made  
19 available ahead of the kind of package of meeting  
20 materials that comes out a few weeks before  
21 comments are due. In particular, we think  
22 discussion documents and questions that you have

1 -- specific questions that you have in need of  
2 feedback would be of particular use. That would  
3 enable us to reach out to our farmers, our  
4 producers, get their feedback, look for answers  
5 for those specific questions for you and to  
6 engage in robust dialogue with our colleagues,  
7 which helps us inform our own opinions and parse  
8 out some of the challenging issues that we can  
9 then provide back to you in the form of written  
10 and oral comments. We do our best work when we  
11 have plenty of time to do it and we imagine that  
12 you might also experience that similarly.

13 Finally, organic production systems  
14 must promote ecological balance and conserve  
15 biodiversity as recognized by the creators of  
16 OEFFA and clearly stated in the organic rule.  
17 OEFFA believes the complex relationships in the  
18 soil, along with diverse populations of soil  
19 organisms are the foundation of organic farming.

20 In the absence of clear applicable  
21 standards, OEFFA has not certified hydroponic,  
22 aeroponic, or aquaponic operations to date. We

1 appreciate the ongoing work of the crop  
2 subcommittee and its compromise proposal. Oxford  
3 Dictionary defines compromise as follows: One,  
4 to settle -- it's a verb. It's an action.  
5 That's important and I'll stop there.

6 MR. CHAPMAN: Harriet, Scott stop  
7 there.

8 MS. BEHAR: Can you complete your  
9 definition of compromise?

10 MS. BARTON: Yes, I'd be happy to.  
11 Thank you, Harriet. One, to settle a dispute by  
12 mutual concession. Two, to accept standards that  
13 are lower than is desirable. And if I may add  
14 OEFFA supports the crop subcommittee compromise.  
15 Thank you.

16 MR. CHAPMAN: Scott?

17 MR. RICE: Hi Julia.

18 MS. BARTON: Hi Scott.

19 MR. RICE: I just wanted to offer that  
20 the CACS continues to have the discussion around  
21 fracking and water issues in general and where  
22 that fits in and appreciate the comments that you

1 submitted and we're kind of fine tuning how we  
2 want to request that be added to our work agenda  
3 and how we might move forward on that issue so,  
4 thank you.

5 MS. BARTON: Thank you, we appreciate  
6 your consideration.

7 MR. CHAPMAN: Thank you, we're going  
8 to have to move on now. Up next is Stephen --  
9 I'm sorry, we have to move on. Up next is  
10 Stephen Walker, followed by Christie Badger.  
11 Stephen, you can start with your name and  
12 affiliation.

13 MR. WALKER: Okay, good morning. I'm  
14 Steve Walker, Operations Manager at MOSA. We  
15 certify about 2000 operations across the U.S. We  
16 submitted half a dozen written comments on agenda  
17 items for this meeting and in this three minutes,  
18 I want to address the proposal on native  
19 ecosystems.

20 We support the concept of a rule  
21 change to require a waiting period before a  
22 native ecosystem site could be used for organic

1 production and we appreciate changes made in  
2 response to the spring comment period but we ask  
3 for further development of the current proposal.  
4 We'd also like to see additional emphasis on  
5 incentives to complement the 10-year waiting  
6 period disincentive.

7           The proposed regulatory change is  
8 pretty simple. It seems fairly practical to  
9 verify and creates a disincentive without  
10 categorically preventing organics regenerative  
11 capability in unfortunate cases where native  
12 ecosystem land has already been taken for  
13 agricultural use. However, we need a native  
14 ecosystem definition and we think such a  
15 definition should assess the land's current  
16 ecological value, which is not necessarily  
17 related to the land's historical use.

18           We do have some unresolved concerns  
19 about suggested verification tools such as  
20 satellite images, old photographs or assessment  
21 of FSA records. We're unsure of the availability  
22 of such information. Accessibility of resources

1 and training will be necessary for consistent  
2 enforcement. Such review tools are not currently  
3 in our certifier toolbox. We'd like  
4 clarification whether such historical  
5 verification would always be expected or only  
6 when we have indicators of recent ecosystem  
7 destruction. And I'd say our toolbox needs both  
8 sticks and carrots; enforcement needs a positive  
9 counterpart.

10           Though probably outside of the scope  
11 of this proposal, we strongly encourage economic  
12 incentives for transitioning conventional acreage  
13 to organic. Our values call us not only to  
14 prevent loss of important habitats but also to  
15 encourage more organic production, especially as  
16 a conventional agriculture replacement. And  
17 there's need for right vision. Unfortunately,  
18 the relative scarcity of native ecosystems  
19 doesn't translate to how most folks usually see  
20 economic value.

21           Yesterday in the context of  
22 considering regeneration and resource depletion,

1 I was pleased to hear a couple of references to  
2 Aldo Leopold. In the forward to A Sand County  
3 Almanac, he wrote, we abuse land because we  
4 regard it as a commodity belonging to us. When  
5 we see land as a community to which we belong, we  
6 may begin to use it with love and respect.

7 Organic farmers may have better eyes  
8 to see the value of biodiversity and cooperation  
9 with Gaia. Education even through enforcement  
10 can expand that global vision for the benefit of  
11 us all. Thanks.

12 MR. CHAPMAN: Thank you. Emily.

13 MS. OAKLEY: Thank you for your  
14 comments and I just wanted to suggest that you  
15 look at the open docket for the comments by  
16 NatureServe because they did provide some  
17 additional tools for referencing back  
18 historically and I also just wanted to point out  
19 that the length of time through which this  
20 proposal might get eventually passed and then go  
21 through rule making is probably pretty long --

22 MR. WALKER: Yes.

1 MS. OAKLEY: -- so I think we can  
2 anticipate that should this get passed at some  
3 point and eventually become a rule, we will have  
4 even greater historical knowledge and satellite  
5 images from which to work. But I also really  
6 appreciate your comment that does this work need  
7 to happen on every single certification  
8 application or only ones in which there is a  
9 question of applicability, so thank you.

10 MR. WALKER: Yes, I kind of imagine  
11 that's something certifiers can work out within  
12 ourselves as far as best practices and so forth  
13 and I'm not criticizing the tools. I'm just  
14 saying that, you know, right now it's not  
15 something we're used to. We can get there.

16 MR. CHAPMAN: Thank you, Stephen. Up  
17 next we have -- sorry Asa, we don't have time.  
18 Up next, we have Christie Badger, followed by  
19 Suzanne McMillan. Christie, you ---

20 MS. BADGER: Good morning.

21 MR. CHAPMAN: -- can start with your  
22 name and affiliation.

1 MS. BADGER: Yes. Good morning, my  
2 name is Christie Badger and I'm speaking today on  
3 behalf of the National Organic Coalition. Thank  
4 you for the opportunity to address the Board and  
5 thank each of you for the important, torturous  
6 and time consuming work that you do as volunteers  
7 on the NOSB.

8 Sanitizers: NOC appreciates the  
9 consideration for adding a comprehensive review  
10 of sanitizers, disinfectants and cleaners to the  
11 work agenda and we are strongly in support of  
12 this important work being added to the work  
13 agenda. NOC urges review of all subcommittees --  
14 - across all subcommittees to help identify areas  
15 where there are gaps in necessary sanitizers or  
16 disinfectants, which aid crops, livestock and/or  
17 handling operations, and promotion of organic  
18 food safety. As noted in our written comments,  
19 this would benefit not only the NOSB, but also  
20 the organic stakeholders.

21 Organic economic development  
22 opportunities: NOC would like to encourage the

1 NOSB to add the topic of organic economic  
2 development opportunities to its work agenda.  
3 Often tough issues could be addressed if some  
4 enterprising person or persons were to capitalize  
5 on a gap or opportunity in organic production or  
6 handling. This would allow entrepreneurs to look  
7 to the NOSB for opportunities when proposing  
8 ideas to investors, helping to inform the  
9 industry of opportunities for growth in the  
10 organic sector.

11 Oxytocin: NOC strongly supports the  
12 subcommittee's recommendation to remove oxytocin  
13 from the National List. Oxytocin is a protein  
14 hormone, not only in -- not a body building  
15 steroid hormone. It occurs in all mammals, both  
16 male and female; however, there is confusion and  
17 the word hormone is misunderstood by consumers  
18 and as such, leaves organic dairy producers open  
19 to claims that hormones are allowed for use. It  
20 is not an essential material for organic  
21 production.

22 As an independent organic inspector

1 performing more than 200 inspections yearly, many  
2 of them dairy operations, I ask farmers if they  
3 need oxytocin. More than 90 percent of them tell  
4 me no, with others telling me that they don't  
5 need it but they like having it in their toolbox.  
6 I have never once had an organic dairy farmer  
7 tell me that they could not remain in production  
8 without oxytocin.

9 Clarifying emergency for the use of  
10 synthetic parasiticides, and organic livestock  
11 production, we urge it to go back to  
12 subcommittee. We understand the hesitancy to  
13 define the term emergency, but this confusion  
14 could be eliminated by defining the term  
15 emergency use for parasiticides.

16 MR. CHAPMAN: Thank you. Questions?  
17 Thank you, Christie.

18 MS. BADGER: Thanks.

19 MR. CHAPMAN: Up next, we have Suzanne  
20 McMillan, followed by Colehour Bondera. You can  
21 start with your name and affiliation.

22 MS. MCMILLAN: Hello, Suzanne

1 McMillan, content director, Farm Animal Welfare  
2 Campaign with the ASPCA, which is the American  
3 Society for the Prevention of Cruelty to Animals.

4 I'm glad to be here today on behalf of  
5 our 6.5 million supporters nationwide. We thank  
6 the NOSB for helping to get the Organic Livestock  
7 and Poultry Practices Rule finalized with USDA.  
8 We remain committed to seeing it implemented as  
9 we approach its third implementation date, now  
10 set for November 14th. However, given the  
11 repeated delays, we no longer feel that we can  
12 afford to await implementation before continuing  
13 to develop further animal welfare recommendations  
14 for the Organic Program.

15 USDA declined in its final rule to  
16 take up a number of outstanding animal welfare  
17 issues, at times citing the need for, or at  
18 minimum receptivity to, NOSB recommendations.  
19 Examples include poultry genetics with respect to  
20 breeds, growth rates or suitability to outdoor  
21 access, swine outdoor areas, mammalian ammonia  
22 rate caps and space allowances for species other

1 than chickens, in particular they called out  
2 turkeys and swine outdoors.

3 To this end, we're grateful for NOSB's  
4 proposed research priority of organic livestock  
5 breeding. This is critical given the organic  
6 regulations requirement of, quote, selection of  
7 species and types of livestock with regard to  
8 suitability for site-specific conditions and  
9 resistance to prevalent diseases and parasites,  
10 unquote. However, even beyond outdoor settings,  
11 genetics are critical because conventional breeds  
12 and strains face severe challenges even in basic  
13 indoor settings. They simply are not made for  
14 basic survival and thriving.

15 Similarly and related is the research  
16 priority proposal of methionine in the context of  
17 a system approach in organic poultry production.  
18 This topic is closely tied to both poultry  
19 genetics and poultry living conditions, each of  
20 which in turn informs other aspects of welfare,  
21 hence very much a systems approach, which it  
22 sounds like you're preparing to take and we

1 encourage and would say is in fact essential for  
2 all questions of welfare.

3 I thank the NOSB for addressing these  
4 two critical topics of poultry genetics and  
5 methionine and I hope you will consider the  
6 additional topics I've mentioned as well. As  
7 always, the ASPCA looks forward to working with  
8 you to provide any input or support that may be  
9 needed. Thank you.

10 MS. SWAFFAR: Thank you, Suzanne.  
11 Emily.

12 MS. OAKLEY: I was wondering if you  
13 had any concerns about animal welfare issues in  
14 the sulfur petition in livestock and the fact  
15 that it's a known skin and eye irritant and that  
16 it would be applied topically to the animals.  
17 Are you concerned about that in any way?

18 MS. MCMILLAN: You know, we haven't  
19 dealt with that issue. We haven't addressed  
20 that. We don't have a position on that. It's  
21 something I would be happy to bring back to some  
22 of our scientists and see if they can formulate a

1 position for us. So, it's nothing I can comment  
2 on right now.

3 MS. SWAFFAR: Thank you. Steve.

4 MR. ELA: I'd be curious about your  
5 organization's position on cruelty to animals if  
6 Tom keeps us through lunch.

7 MS. MCMILLAN: I didn't hear all of  
8 that. Okay.

9 MS. SWAFFAR: I have one for you.  
10 Suzanne, thank you so much for your commitment to  
11 seeing forward OLPP and I think that's one thing  
12 that was really left out of the Program update  
13 yesterday. So I'd like to ask the Program if you  
14 have an update on OLPP?

15 DR. TUCKER: OLPP continues to be  
16 under review by the administration.

17 MS. MCMILLAN: Thank you. All right,  
18 thank you.

19 MR. CHAPMAN: Thank you. Up next is  
20 Colehour Bondera, followed by Robert Rankin. To  
21 respond to Steve's questions, I don't know how  
22 many questions animals ask, so that might be

1 somewhat related to whether or not they get fed.  
2 Colehour.

3 MR. BONDERA: Aloha ---

4 MR. CHAPMAN: If you could state your  
5 name and affiliation.

6 MR. BONDERA: Colehour Bondera, I'm  
7 here from a diversified Kanalani Ohana Farm in  
8 Hawaii. My thanks to Beyond Pesticides for  
9 allowing me to be here as well.

10 I'll let you all know that I grew up  
11 with 10 siblings on a farm in Oregon. We weren't  
12 wealthy but my family knew that if we had to do  
13 it, that a watered down soup isn't poisonous but  
14 it also isn't as tasty or healthy, so please do  
15 not water down the standards of organics.

16 Let me share some thoughts about  
17 organics. They may include temporary variances  
18 but at the end of the day, your role is to  
19 guarantee the integrity of organics.

20 As Lisa Brines noted to us, the  
21 livestock subcommittee will be considering a  
22 petition for OAD, oxalic acid dihydrate to help

1 control varroa mite in bee hives. Remember that  
2 in Hawaii, bees do not have the same kind of  
3 downtime as some bees do in temperate areas.  
4 Please urgently consider approval of this  
5 material.

6 Also, I really want you to seriously  
7 consider any requests that you receive for a  
8 boric acid formulation to help with little fire  
9 ants. Hawaii is facing a little fire ant an  
10 emergency in the coffee crop and at this time,  
11 there is no certified organic control.

12 Regarding hydroponics, let me first  
13 thank Francis Thicke for his service on the NOSB.  
14 He and I overlapped, with my service ending in  
15 January 2016. Really thank you, Francis, for  
16 your support in guiding us through hydroponics.

17 Here are some hydroponic thoughts that  
18 come to you via me, via Sam Welsch of OneCert who  
19 served on the hydro task force and they include  
20 the following. In 1995 NOSB said, quote unquote,  
21 hydroponic production in soil-less media to be  
22 labeled organically produced shall be allowed if

1 all provisions of the OFPA have been met. Since  
2 it is impossible to regulate hydroponic  
3 production, which compiles with the OFPA  
4 requirement of management -- for management of  
5 soil content in the soil, it can't be certified.

6 Next, remember no certified hydroponic  
7 operations existed before 2005 when NOP decided  
8 that hydroponics could be certified. Prior it  
9 was clear that OFPA and USDA organic regulations  
10 required soil. After the NOP statement,  
11 certifiers began ignoring those requirements in  
12 order to certify hydroponic operations.

13 In reference to a letter from USDA,  
14 Richard Matthews in 2005, we all should still be  
15 awaiting the rule requirements for improving or  
16 maintaining soil organic matter content for  
17 hydroponic operations. Remember that soil is the  
18 soul of organic and really overall, NOSB must  
19 work with NOP to ensure enforcement of standards  
20 as advised. Mahalo.

21 MR. CHAPMAN: Questions? Colehour, I  
22 want to ask you about that statement you just

1 read. If it was so clear that it was not going  
2 to be allowed, why would they put that in there  
3 in the first place? I don't see any similar  
4 statements around irradiation or not, you know,  
5 GMO organisms. Why even put that in there? Why  
6 create the possibility of confusion?

7 MR. BONDERA: I think -- my read of  
8 that would be leave the door open as a  
9 possibility if somebody -- to make sure that the  
10 if part, what, you know, if it could be addressed  
11 but it hasn't been so I think why would you  
12 include that? Because it hadn't been thought  
13 about or discussed or analyzed enough by anybody  
14 and so the argument must have been between the  
15 people involved, you know, maybe, if, let's talk  
16 about it. But since it doesn't, I don't think  
17 that there's any further discussion at this time  
18 unless someone could --

19 MR. CHAPMAN: Thank you and I --

20 MR. BONDERA: -- explain that.

21 MR. CHAPMAN: -- just want to point  
22 out that in the crops proposal, there is a quote

1 from 2002 from the National Organic Program,  
2 taken from the transcripts of an NOSB meeting  
3 stating that the --- quote unquote, from the  
4 program manager, Matthews, the policy statement  
5 that is on the web in regards to the scope of the  
6 National Organic Standards includes hydroponics,  
7 so it goes as far back as 2002.

8 MR. BONDERA: To be --

9 MR. CHAPMAN: That the Program was  
10 saying --

11 MR. BONDERA: -- considered, right.

12 MR. CHAPMAN: -- it was included.

13 MR. BONDERA: Right.

14 MR. CHAPMAN: Yes.

15 MR. BONDERA: As a --

16 MR. CHAPMAN: You had stated 2005.  
17 I'm just saying it went back as far as 2002.

18 MR. BONDERA: All right, thank you.

19 MR. CHAPMAN: Thank you.

20 MR. BONDERA: You're welcome.

21 MR. CHAPMAN: Up next is Robert  
22 Rankin, followed by Lori Klope. Sorry, Lori.

1 MR. RANKIN: Hi, Robert Rankin --

2 MR. CHAPMAN: Robert, --

3 MR. RANKIN: -- executive director of  
4 International Food Additives Council. IFAC is a  
5 global association representing manufacturers of  
6 food ingredients including food additives  
7 permitted for use in organic products.

8 IFAC strongly supports the Handling  
9 Subcommittee's unanimous vote to re-list sodium  
10 phosphate. Phosphates have a long history of  
11 safe use in food and their safety is supported by  
12 global regulatory authorities. Sodium phosphates  
13 are essential in the production of certain  
14 organic dairy products, particularly shelf stable  
15 cheese powders and cheese sauces.

16 We would like to reiterate some of our  
17 previous comments regarding the NOSB discussion  
18 document on phosphates published last April.  
19 First, it has been suggested phosphates interfere  
20 with the absorption of calcium. This is not a  
21 true statement. The scientific literature  
22 actually shows that phosphorus aides in the

1 absorption of calcium.

2 Another point we'd like to make is the  
3 reference to the 2001 TAP report and health  
4 impacts related to the use of phosphates as bowel  
5 purgatives and cleansers. The discussion  
6 document omits an important statement that these  
7 affects are not directly relevant to food as they  
8 are administered differently than consuming  
9 phosphates through food. This point is critical  
10 and should be considered by the NOSB.

11 Thirdly, the discussion document  
12 incorrectly suggests consumers are not aware they  
13 are consuming phosphates because phosphorus does  
14 not appear on the nutrition facts panel. Sodium  
15 phosphates, like all phosphates, are required to  
16 be included in the ingredient list whenever they  
17 are used in a food.

18 Finally, the discussion documents  
19 suggest there are alternatives to sodium  
20 phosphates in Europe. The U.S. and European  
21 organic markets are very different in part due to  
22 consumer preferences. Alternatives to sodium

1 phosphate do not perform the same function and  
2 their use results in an inferior product compared  
3 to those that contain sodium phosphates.

4 We would like to reiterate some past  
5 comments as well on the technical report on  
6 phosphates. First of all, phosphates do not  
7 increase serum phosphorus more so than natural  
8 occurring phosphorus. We also object to the  
9 claim that the elevated serum phosphorus  
10 contributes to the development of renal and  
11 vascular disease in the general population. The  
12 existing literature focuses on specific health-  
13 compromised patient populations and cannot be  
14 applied to the majority of consumers.

15 As we noted previously, we sponsored  
16 an expert scientific evaluation, independent, I  
17 should say, of the peer-reviewed literature  
18 regarding food phosphates. The report found no  
19 definitive conclusion between the consumption of  
20 phosphates and negative health impacts in the  
21 general population. This was published in  
22 September in Comprehensive Reviews in Food

1 Science and Food Safety and the report reviewed  
2 over 110 primary research articles as opposed to  
3 the TR, which looked at about 30.

4 We'd also like to support the Handling  
5 Subcommittee's vote to re-list non-amidated  
6 pectin. This is used to thicken and gel organic  
7 products, particularly with jams and jellies, as  
8 well as fruit fillings commonly found in bakery  
9 products. In many of these applications, no  
10 alternative exists and organic pectin is not  
11 available in the quantity needed to supply the  
12 market.

13 We also finally support the re-listing  
14 of konjac flour. This has numerous functions and  
15 it's used in a variety of products.

16 In conclusion, we support the  
17 proposals to retain -- or the votes to re-list  
18 sodium phosphates and non-amidated pectin. We  
19 also support the re-listing of konjac flour.  
20 Thank you.

21 MR. CHAPMAN: Thank you. Emily,  
22 Harriet, Scott and Joelle briefly please. Emily.

1 MS. OAKLEY: Thank you for your  
2 comments. You mentioned that sodium phosphate is  
3 not used in Europe or allowed and that the  
4 consumer preferences between the United States  
5 and Europe are different. Would you say that's  
6 attributable to a greater preference for  
7 processed foods in the United States?

8 MR. RANKIN: Essentially. The  
9 products in which sodium phosphate is used in  
10 organic cheese-type products like macaroni and  
11 cheese and things, those aren't commonly consumed  
12 in Europe in the market. The consumers when they  
13 consume their cheese, it's usually through the,  
14 you know, cheese itself versus, you know,  
15 processed products that use a cheese.

16 MS. SWAFFAR: Harriet.

17 MS. BEHAR: Sodium citrate is also --  
18 can be used in cheese powders. Can you speak to  
19 why you need the sodium phosphate instead of  
20 sodium citrate?

21 MR. RANKIN: Sure and there will be  
22 commenters addressing that more specifically than

1 I, but yes it is. It is -- it can be used. It  
2 does not perform the same function as sodium  
3 phosphate. It doesn't result in some of the same  
4 properties that sodium phosphate presents in  
5 those products like organic macaroni and cheese  
6 and such. There's a buffering capacity to  
7 achieve a -- you know, when working with certain  
8 pH levels in foods. Sodium phosphate has a  
9 better result than sodium citrate there in terms  
10 of emulsification.

11 Sodium phosphate performs better than  
12 sodium citrate. When you use sodium citrate or  
13 use a combination of the two, you actually have  
14 to use more of the material to achieve the same  
15 functions. Sodium phosphate you can use a lower  
16 level than when you combine with sodium citrate  
17 and then it just also provides the expectation  
18 consumers want in terms of the consistency, the  
19 texture of the product. Sodium phosphate gives  
20 that creamier texture. Sodium citrate, not so  
21 much. It's not as creamy and it also can result  
22 in some off flavors that consumers would maybe

1 not prefer as much as sodium phosphate allows.

2 MR. RICE: I had a question on konjac  
3 flour. At our spring meeting, we asked if you  
4 could forward us some specific products that are  
5 currently certified organic and use konjac flour  
6 and I didn't see any of that info submitted so  
7 just looking for any products that are out there  
8 that are currently certified and employing that.

9 MR. RANKIN: Right, we looked for that  
10 and we made some inquiries and we weren't able to  
11 get any information for this meeting so I'm not  
12 aware of that.

13 MR. RICE: Okay, thank you.

14 MR. CHAPMAN: Joelle.

15 MS. MOSSO: Just a quick question in  
16 regards to the concentration of sodium phosphates  
17 often used in the annotation with the dairy  
18 products.

19 MR. RANKIN: Okay, what was the  
20 question?

21 MS. MOSSO: Concentration of sodium  
22 phosphates in a finished application.

1           MR. RANKIN: It's very small. There  
2 is someone commenting after me who can answer  
3 that more specifically. She's a food scientist.  
4 I don't know the exact levels. Sorry.

5           MR. CHAPMAN: Thank you. I have one  
6 question too. You had a note in there saying  
7 that if sodium phosphates were used in a food, it  
8 would appear on the ingredient panel but we  
9 received a written comment from a food  
10 manufacturer who says one of their processors  
11 uses it to prevent fouling of cream lines in a  
12 dairy processing plant and that's considered a  
13 processing aid and not required to be labeled.  
14 So, who is right?

15           MR. RANKIN: Processing aids don't  
16 need to be labeled. Processing aids are not  
17 expected to provide any presence in the final  
18 product, so I would say if it's added as an  
19 ingredient in this type of a function for the  
20 cheese, you know, powdered cheese sauce, it would  
21 be listed and we also found a list of other  
22 products -- organic products, mostly macaroni and

1 cheese type products but also protein dairy  
2 shakes. They all list sodium phosphate on the  
3 ingredient list. I can't speak to that specific  
4 question about the processing. International  
5 Dairy Foods Association may be speaking and could  
6 speak to that.

7 MR. CHAPMAN: Processing aids don't --  
8 are removed from the final product or don't have  
9 a technical affect in the final product?

10 MR. RANKIN: It's expected they are  
11 not really present in the final product. They  
12 are just used to kind of help make the product  
13 and by the time you get to the final product,  
14 it's not there in any measurable or you know,  
15 notable levels.

16 MR. CHAPMAN: Thank you. Thank you.  
17 Up next we have Lori, followed by Ron Mitchell.

18 MR. KLOPF: Good morning. My name is  
19 Lori Klopff and I work for ICL Food Specialties, a  
20 food ingredient company in St. Louis. I'm here  
21 to support the continued listing of sodium  
22 phosphates on the National List.

1                   Our company is a member of the  
2 International Food Additives Council and we have  
3 submitted our written comments to the NOSB  
4 through this association.

5                   Sodium phosphates have been on the  
6 National List for a limited use in dairy foods  
7 for many years. They are safe in human foods and  
8 have an essential functionality in certain types  
9 of organic dairy foods. Today I will address  
10 some of the reasons why sodium phosphates are  
11 required for these food applications.

12                   The category of sodium phosphates on  
13 the National List includes three food additives:  
14 monosodium, disodium and trisodium phosphate.  
15 One of the dairy food applications that may  
16 include sodium phosphates are those with a cheese  
17 sauce or powder such as macaroni and cheese and  
18 cheese dips. Dairy-based protein shakes and  
19 beverages have also become popular items for the  
20 organic consumer. These food products require  
21 sodium phosphates to provide a smooth and creamy  
22 mouthfeel. This is accomplished through pH

1 buffering and also emulsification of the natural  
2 protein, fat and water in the dairy products.

3 In organic foods -- dairy foods,  
4 sodium phosphates are usually selected as the  
5 best choice for emulsifying salt due to superior  
6 buffering and emulsifying capacity, texture and  
7 taste.

8 The buffering system in dairy foods is  
9 typically a neutral pH. In this graph, the  
10 ability of sodium phosphate to buffer is compared  
11 with sodium citrate, another emulsifier. In the  
12 neutral pH range shown in the green box on the  
13 graph, it is apparent that sodium phosphate, the  
14 black line, is much more effective than sodium  
15 citrate; therefore, a lower level of sodium  
16 phosphate can be used to achieve the required pH.

17 Similarly, the ability of sodium  
18 phosphates to provide emulsification to dairy  
19 foods is much better than with sodium citrate.  
20 While some food formulators will use a phosphate  
21 citrate blend, the overall amount required is  
22 higher, which increases both the number of

1 ingredients and the cost of the product. In  
2 cases where only sodium citrate is used, it has  
3 been found that calcium citrate crystals may also  
4 form in the cheese products due to the higher  
5 level of sodium citrate needed for this  
6 functionality.

7 Both the texture and the flavor of  
8 dairy products will also be affected by the  
9 choice of an emulsifying salt. The texture of  
10 cheese has been shown to be better when only  
11 sodium phosphates are used. In addition, sodium  
12 citrates based on citric acid can contribute to  
13 sour flavor to finished foods while the sodium  
14 phosphates do not affect the taste.

15 In summary, sodium phosphates have  
16 been determined to be safe for human consumption  
17 by the U.S. and by international food regulatory  
18 agencies. Sodium phosphates are essential for  
19 use in dairy foods. They provide the required  
20 texture, stability and taste to these organic  
21 foods and there are not other suitable  
22 alternatives that provide the same properties.

1 Thank you.

2 MR. CHAPMAN: Thank you. Questions?

3 Lisa.

4 MS. DE LIMA: Hi. Do you know if a  
5 combination of organic corn starch and organic  
6 maltodextrin would have a similar effect, because  
7 I see some products on the market when it comes  
8 to macaroni and cheese that use that combination  
9 and don't have sodium phosphates.

10 MS. KLOPF: No, they would not have  
11 the same. They are not emulsifiers, so they  
12 would not have the same effect. In a dairy  
13 product, you need an emulsifier to take the  
14 protein, fat and water in the dairy product and  
15 basically turn that into one phase. That's what  
16 emulsification is, so the starches will not do  
17 that.

18 MS. DE LIMA: So could the emulsifier  
19 be a non-animal enzyme that's providing the same  
20 function? I'm trying to figure out what else in  
21 this other -- this product that doesn't have the  
22 phosphate, how they're getting a --

1 MS. KLOPF: And what we've found too -  
2 - we've looked at some of those and when we've  
3 actually made those products, like the boxed  
4 macaroni and cheese mixes, you do not have a  
5 cheese sauce that is creamy and smooth like you  
6 would in what you'd anticipate or expect to find  
7 in a normal macaroni and cheese product.

8 MS. DE LIMA: Okay.

9 MR. CHAPMAN: Joelle.

10 MS. MOSSO: Same question. Can you  
11 give any indication to the concentration level of  
12 sodium phosphates?

13 MS. KLOPF: It can vary, but sodium  
14 phosphates are very effective pH buffers and  
15 emulsifiers, as I showed on the graph, so really  
16 very low levels are affective. Approximately  
17 half percent or less is typically used to achieve  
18 that effect.

19 MR. CHAPMAN: Thank you. Up next is  
20 Ron Mitchell, followed by Anja Anderson.

21 MR. MITCHELL: Hello. Thank you for  
22 having me. My name is Ron Mitchell. I'm the

1 owner-operator of Local Greens Farm in Berkeley,  
2 California, a family owned urban vertical indoor  
3 farm. We grow sprouts, microgreens, lettuce and  
4 basil year around for retail markets in Northern  
5 California. I have been growing organic  
6 hydroponic vegetables for over 47 years.

7 The advantage of our sustainable  
8 system: All incoming air and water is filtered  
9 so we have no insects. We use no pesticides,  
10 herbicides, fungicides or any cides at all. Our  
11 recirculating system uses two percent of the  
12 water used by an average farm. We compost all of  
13 our plant waste. Our carbon foot print is very  
14 small and we are working towards zero in the near  
15 future.

16 Here is how we do this. I grow all  
17 our plants on HDPE plastic trays from germination  
18 to seven to ten days old using only filtered  
19 water. I then cut them right above the roots and  
20 package them and sell them as microgreens. I  
21 sell about 8,000 pounds of these per month. I  
22 take all the roots and seeds and waste, about

1 14,000 pounds per month, and compost it. I give  
2 80 percent of the raw compost to organic farmers  
3 and gardeners to use on their land such as UC  
4 Berkeley, which is right next door. The  
5 remaining 20 percent get fed to my army of worms  
6 that turn it into vermicompost.

7 I then use this vermicompost to make  
8 my tea -- my vermicompost tea. This tea is used  
9 to feed my larger plants I grow, like basil and  
10 lettuce. The roots of these plants are alive  
11 with bacteria and fungi. I know this because I  
12 see them in my microscope. We grow this way not  
13 to out-compete but to get more organic vegetables  
14 on the table year-round and to help save the  
15 planet.

16 MR. CHAPMAN: Thank you. Questions  
17 for Ron? Steve.

18 MR. ELA: So how would you  
19 characterize your crop rotation then? I mean,  
20 you're composting material, but where's the  
21 rotation and where are your nutrient sources  
22 other than the vermicompost?

1           MR. MITCHELL: Well, the rotation, it  
2 happens all the time, every 10 days. I mean, we  
3 change product on the trays and that also changes  
4 the compost. And what was the other question?

5           MR. ELA: The source of -- do you use  
6 other nutrition other than vermicompost for the  
7 tea you mentioned.

8           MR. MITCHELL: Yes. That is  
9 proprietary but we do use OMRI-certified  
10 components. For instance, we use kelp that's,  
11 you know -- I mean it's really useful for a lot  
12 of different things.

13          MS. OAKLEY: Sorry to interrupt. What  
14 was it that you just said? I didn't hear that.  
15 You use what? I didn't hear that.

16          MR. MITCHELL: Oh, kelp.

17          MS. OAKLEY: Kelp. Thank you.

18          MR. MITCHELL: Yes, among other  
19 things.

20          MR. CHAPMAN: Thank you. Harriet.

21          MR. MITCHELL: Also I would like to  
22 make a comment about the use of nitrogen. In my

1 work, I find that most people use way too much  
2 nitrogen in the soil or anywhere just because  
3 they don't know the levels.

4 MR. CHAPMAN: Thank you. Harriet.

5 MS. BEHAR: Can you tell me about the  
6 artificial light? Is it full spectrum, how many  
7 hours?

8 MR. MITCHELL: Yes. It's different  
9 for each type of plant, and I've been doing this  
10 work for over 15 years, working with lighting,  
11 and we use LED lighting that has been worked  
12 through the universities to the right spectrum  
13 for each plant, and we also give them about six  
14 hours of what most people think of as rest but is  
15 actually when the plant really grows, using the  
16 energy it gets from the light.

17 MR. CHAPMAN: Thank you. We have to  
18 move on. Sorry Asa. We have to keep going.  
19 Sorry. Thank you very much.

20 MR. MITCHELL: Thanks for having me.

21 MR. CHAPMAN: Yes. Up next is Anja,  
22 followed by Jessica Knutzon. Sorry. Anja, you

1 can start with your name and affiliation for the  
2 record.

3 MS. ANDERSON: My name is Anja  
4 Anderson, and I'm here to represent IPPA, the  
5 International Pectin Producers Association, and  
6 I'm here to provide comments to the Board on  
7 pectin.

8 So IPPA is a global association of  
9 independent companies who produce pectin. Total  
10 pectin production from IPPA members represent  
11 more than 95 percent of the commercially  
12 available volume. And IPPA supports retaining of  
13 non-amidated pectin on the National List.

14 Pectin is naturally present in plants;  
15 however, from a commercial side, pectin  
16 containing raw materials of interest include peel  
17 from lemon, lime and oranges, and also apple  
18 pomace. Commercial pectin is obtained by  
19 extraction from selected raw materials. The raw  
20 materials are by-products from industrial juice  
21 and citrus oil production. So by-products are  
22 converted into high specialty ingredients that

1 can be used in the food industry. Specific  
2 desirable functional properties of the pectin are  
3 controlled through selection of raw materials and  
4 by observing certain extraction and processing  
5 conditions.

6 Currently, no IPPA member produces  
7 certified organic pectin, and to the best of our  
8 knowledge, certified organic pectin is not  
9 available. Also, organic raw materials are not  
10 available in the quality or quantity to support  
11 sustainable production of organic pectin.

12 It is our understanding that this  
13 market situation is not likely to change for  
14 several years, and as such, we recommend  
15 retaining a non-amidated pectin on the National  
16 List. Thank you.

17 MR. CHAPMAN: Harriet.

18 MS. BEHAR: Is there any task force or  
19 anything in your association to overcome some of  
20 these barriers to producing organic pectin?

21 MS. ANDERSON: We're working with  
22 suppliers, and we need raw materials from both

1 lime and citrus and oranges currently, and what  
2 our raw material suppliers inform us is that the  
3 lime and lemons -- organically produced or grown  
4 limes and lemons are mainly sold to fresh produce  
5 so they're not even -- and we use the by-products  
6 from juice production, so the raw materials are  
7 not available for us. We don't have a task force  
8 per se but we monitor the market situation.

9 MR. CHAPMAN: Thank you. Up next is  
10 Jessica Knutzon, followed by Wanda Jurlina.  
11 Jessica, you can start with your name and  
12 affiliation.

13 MS. KNUTZON: I have a presentation  
14 but I'll just start talking. I am Jessica  
15 Knutzon and I am a marketing manager at CP Kelco,  
16 a hydrocolloid manufacturer.

17 Pectin occurs naturally and provides  
18 structure in many fruits and vegetables. Pectin  
19 as an ingredient is a polysaccharide, typically  
20 extracted from citrus, apple and sugar beet.  
21 Pectin can provide gelation, viscosity, protein  
22 protection or emulsification. It has many unique

1 properties, one of which is its great acid  
2 stability, which is key to many fruit-based  
3 products like juices and preserves.

4 As a marketer, I cannot forget to  
5 mention consumers. Consumers are familiar with  
6 pectin. It's an ingredient that their families  
7 use to make jam, and it's recognizable and easy  
8 to understand as a product.

9 There are three main types of pectin  
10 used as an ingredient. There is high ester, low  
11 ester conventional and low ester amidated pectin.  
12 My colleague, Wanda, who will be commenting right  
13 after me will present more details on low ester  
14 pectin and I will review high ester pectin with  
15 you today.

16 As mentioned before, pectin can  
17 provide gelation, which is why products like jam  
18 and jelly gel. Pectins gel under very specific  
19 conditions. The pH level needs to be quite low,  
20 typically less than 3.5. Brix, which is the  
21 soluble solids of a product or dissolved sugar,  
22 needs to be pretty high as well, so there needs

1 to be relatively high sugar system to make the  
2 pectin gel. Without the high sugar content and  
3 the low pH level, there won't be a gel with high  
4 ester pectin. Without these two conditions, you  
5 will get viscosity or protein protection.

6 Here are some of the products that use  
7 gelation and use pectin to create them. So jams,  
8 jellies, marmalades, bake stable, bakery fillings  
9 and gelatin-free confectionary products.

10 Products that don't meet the  
11 requirements for gelation benefit from high ester  
12 pectin in different ways. High ester pectin  
13 provides products like fruit juices, fruit  
14 beverages and low sugar drinks with viscosity and  
15 mouthfeel.

16 High ester pectin also provides  
17 protein protection in milk beverages, fruit  
18 beverages, protein fortified fruit drinks and  
19 smoothies. High ester pectin plays an important  
20 role in food manufacturing across a variety of  
21 applications. Wanda Jurlina will now present  
22 information on low ester pectins for you.

1                   MR. CHAPMAN: Thank you. Thank you  
2 very much.

3                   Up next is Wanda, followed by Lee  
4 Frankel. Wanda, you can start with your name and  
5 affiliation.

6                   MS. JURLINA: Here we go. All right,  
7 my name is Wanda Jurlina. I am the manager of  
8 technical services for CP Kelco. We are a  
9 hydrocolloid producer and in the product range  
10 that we produce includes pectin -- a wide variety  
11 of different pectin ingredients.

12                   So with that, Jessica has introduced  
13 you to the range of pectin products that are on  
14 the market to meet the different needs of the  
15 producers of a variety of different types of  
16 products. I'm going to focus on low ester  
17 conventional pectins, in addition to the high  
18 ester pectins. Those are the ones that are  
19 approved for use in organic products.

20                   Amidated products, as you all know,  
21 were voted to be removed from the list and are  
22 not currently used in organic products. From our

1 perspective, it's very easy to tell which pectins  
2 are amidated, and I can say for Anja's company as  
3 well, all of the names of those pectins that are  
4 amidated have a designation in the name that  
5 indicate that it's amidated and they will say on  
6 their product data sheets that they're amidated.  
7 So they are very well identified for the market  
8 to understand which pectins they can use in  
9 organic products.

10           Jessica gave you the basics on where  
11 high ester pectins gel. The cool thing about low  
12 methoxyl pectins is that they gel in a variety of  
13 different situations. They're much more flexible  
14 on the pH than the solids levels that they  
15 function at, so it gives product developers that  
16 aren't working at very high solids and very low  
17 pH an option to create a gel texture.

18           So those types of products that we see  
19 within the organic product families, where low  
20 methoxyl pectins are typically used, include  
21 products like yogurt fruit preps. So think of  
22 the fruit that's on the bottom of an organic

1 yogurt cup or is blended with yogurt white mass  
2 to produce a stirred product. Pectin is used  
3 extensively in those types of products to  
4 actually thicken the product, keep it uniform in  
5 the 1,000-kilo tote that it's packaged in, as  
6 well as holding onto liquid in those systems so  
7 that they don't get a lot of separation in that  
8 huge container.

9 It's also used extensively in yogurt  
10 white mass where people are looking for a non-  
11 gelatin or a non-starch based thickener to use in  
12 those particular products. High ester pectins  
13 don't give body and texture in those types of  
14 systems, so they're not routinely used in that  
15 application.

16 The last area is fruit spreads. Fruit  
17 spreads give manufacturers an option to deliver a  
18 product with less sugar than the traditional jams  
19 and marmalades. So there's a range of those  
20 types of products on the market as well.

21 I've also included two other slides  
22 that I shared during the April meeting reminding

1 the team -- the NOSB, the differences between  
2 pectin and the competition as far as the  
3 properties.

4 MR. CHAPMAN: Thank you. Emily.

5 MS. OAKLEY: I'm sure you're aware  
6 from previous comments of the desire to have an  
7 organic pectin.

8 MS. JURLINA: Yes.

9 MS. OAKLEY: Could you elaborate on  
10 that and tell me what that limitation is?

11 MS. JURLINA: I can't -- I actually  
12 would have loved to be the that presented that  
13 for you. We have a great slide that we use.  
14 It's called the lemon's tale. It talks about  
15 what goes into producing organic pectin. The  
16 first thing is, is you have to have an organic  
17 peel source in a place where you have a drying  
18 operation that basically within 24 hours of  
19 juicing the fruit and pressing it for oil, that  
20 you have it sufficiently dried so that it can be  
21 transported to manufacturing locations.

22 Setting up drying operations is

1 extremely expensive and when you're looking at a  
2 highly fragmented industry, like an organic  
3 processor, it's extremely difficult to put the  
4 commercial resources into drying the peel where  
5 it's available so that you have enough organic  
6 peel to actually produce an organic pectin. So  
7 sourcing the raw material truly is the biggest  
8 concern for our industry to provide a certified  
9 organic product.

10 MR. CHAPMAN: Steve.

11 MR. ELA: Do you see any potential for  
12 organic options for the equivalent of an amidated  
13 pectin that works under the conditions you've  
14 described? I mean there are a number of organic  
15 fruit spreads. I mean we make an organic jam  
16 that has to be labeled "made with organic"  
17 because of the amidated pectin. Are there any  
18 things on the horizon to replace that?

19 MS. JURLINA: So if I look at the  
20 differences between an LMA pectin and an LMC  
21 pectin, an LMA pectin gives you a relatively firm  
22 and cuttable texture very similar to a high ester

1       pectin in a high solid system. The low methoxyl  
2       conventional pectins tend to have a softer  
3       structure and a more spoonable type of texture  
4       that they create. That's just inherent to the  
5       properties of the basic pectin.

6                 We've made strides in improving the  
7       LMC pectins and we actually have a new family of  
8       LMC pectins that does take the organic processor  
9       closer to an LMA pectin but I don't see the  
10      industry duplicating the properties of an LMA  
11      pectin without amidation.

12                MR. CHAPMAN: Thank you, Harriet, and  
13      then we'll have to stop there.

14                MS. BEHAR: So I make pectin at home,  
15      and I use the low methoxyl pectin, and I just add  
16      in some more calcium, and that seems to give it a  
17      very firm texture but --

18                MS. JURLINA: Right.

19                MS. BEHAR: -- so I don't know why  
20      other people couldn't do that but the main  
21      question I want to --

22                MS. JURLINA: The industry does do

1 that.

2 MS. BEHAR: Oh, they do add in extra  
3 to have that stiffer?

4 MS. JURLINA: Yes.

5 MS. BEHAR: I don't know anybody  
6 that's gotten my jam in the audience but -- where  
7 is most of the pectin in the -- you know, that  
8 you're using, currently made? Is it made  
9 domestically? I'm just trying to figure out --

10 MS. JURLINA: Okay.

11 MS. BEHAR: -- because you're saying  
12 that it's kind of an infrastructure issue, so I'm  
13 trying to figure out --

14 MS. JURLINA: Okay. All right.

15 MS. BEHAR: -- why that's a problem.

16 MS. JURLINA: So if you want to start  
17 all the way back to where the peel comes from, a  
18 lot of the peel -- well, you have to have both  
19 parts, so the peel is produced in Latin America.  
20 We have some peel coming from small pockets of  
21 Europe. There's peel coming from areas in China.  
22 The pectin is currently produced in

1 Europe. There's plants in Mexico. There's  
2 plants in Brazil. We're starting to see  
3 producers in China making pectin. So it's a very  
4 diverse industry in the locations. There are no  
5 domestic producers of pectin --

6 MR. CHAPMAN: Thank you.

7 MS. JURLINA: -- or pectin plants.

8 MR. CHAPMAN: Thank you very much. Up  
9 next we have Lee Frankel, followed by Emily  
10 Lyons. Lee, you can start with your name and  
11 affiliation.

12 MR. FRANKEL: Sure, thank you. My  
13 name is Lee Frankel, and I'm here on behalf of  
14 the members of the Coalition for Sustainable  
15 Organics.

16 First of all, thank you for your time  
17 that you devote to help maintain and strengthen  
18 the organic brand and the organic program. I  
19 really appreciate your dedication. Nonetheless,  
20 the CSO does not support the four proposals of  
21 the Crop Subcommittee. I carefully read the  
22 justifications given by the Crop Subcommittee for

1 the need for the prescribed 50/20 formula to  
2 create the dividing line between accepted and  
3 prohibited organic production methods. I found  
4 the essential stated reason for the 50/20 formula  
5 was to create the most soil-like biology possible  
6 in a container to meet the minimum expectations  
7 of the Crop Subcommittee.

8 The Crop Subcommittee specifically  
9 references Dr. Martine Dorais as the expert on  
10 appropriate levels of biology in container  
11 systems. So I called her to understand her work.  
12 She has recently completed and collected data on  
13 tomatoes, peppers and cucumbers grown in organic  
14 soil and organic production systems. And her  
15 data is showing higher levels of biological  
16 activity and diversity in organic container  
17 production systems relative to organic soil  
18 systems.

19 In short, the assertion that biology  
20 is less active and less diverse in containers is  
21 not backed up by the evidence. Furthermore,  
22 organic fertility products come from animal and

1 plant sources so growers and containers are in  
2 fact cycling nutrients from their previous cycle  
3 of food production into a new crop.

4 If you believe that there are products  
5 that do not require the active organic biology  
6 that we expect, then please address them to the  
7 National List process rather than arbitrary  
8 restrictions on whether growers can use their  
9 irrigation systems to aid in the feeding of the  
10 organism living in the root zone of their crops.

11 I also do not envy the members of the  
12 NOSB as you took on the tough task to allow some  
13 container systems while minimizing the appearance  
14 of picking winners and losers and the appearance  
15 of managing the economics of the market through  
16 the proposal. However, the proposal does create  
17 some head-scratchers. Nursery trees for fruit  
18 growers will be in containers for several years  
19 but lettuce is not allowed to be outside the soil  
20 for just a few weeks.

21 Sprouts are said to be exempt because  
22 they're grown only in water but many sprouts are

1 grown in substrate and even the same sprout  
2 themselves.

3 Herbs are exempted but microgreens are  
4 not. Basil is okay but kale growing right next  
5 to it in the same facility with the same  
6 nutrition systems also is not. I guess mushrooms  
7 were exempted in the justification but then never  
8 mentioned in the proposed regulation.

9 So while the CSO believes that the  
10 USDA's interpretations of the regulations  
11 currently are correct and there's no need for  
12 additional regulatory action, we can recognize  
13 the inconsistencies between auditors. If the  
14 NOSB feels like there must be modifications to  
15 regulations, then I would encourage the NOSB to  
16 review the criteria established by multiple  
17 auditors that currently certify production that's  
18 not in the outer crust of the earth. Thanks.

19 MR. CHAPMAN: Thank you, Lee. I don't  
20 see any questions. Thank you.

21 MR. FRANKEL: Okay, I have a copy of  
22 the report as well with the biological study for

1 your reference.

2 MR. CHAPMAN: Thank you. Up next is  
3 Emily Lyons, followed by Jessica Walden.

4 MS. LYONS: Good morning. My name is  
5 Emily Lyons, and I'm here on behalf of the  
6 International Dairy Foods Association.

7 IDFA represents the dairy  
8 manufacturing and marketing industry and their  
9 suppliers, including several organic dairy  
10 companies. I appreciate this opportunity to  
11 comment today on the sunset review of sodium  
12 phosphates.

13 In general, IDFA supports that the  
14 Board renew the use of sodium phosphates for use  
15 in dairy products. Today my comments are  
16 specifically going to focus on how and why sodium  
17 phosphates are used in dairy products with  
18 specific emphasis on their use in processed  
19 cheese.

20 Sodium phosphates are emulsifying  
21 salts that are used when there is no alternative  
22 that exists and it's essential to the production

1 of organic processed cheese products and some  
2 fluid products, such as heavy creams.

3 Emulsifying salts are used in dairy  
4 products to supplement the functional properties  
5 of milk proteins by removing calcium ions from  
6 the casein micelle, a.k.a. it binds the calcium  
7 in the product and then also helps to solulyze  
8 and hydrate proteins. It stabilizes and promotes  
9 emulsification. It also assists in controlling  
10 pH and helps form the desired structure and form  
11 of processed cheese after it's cooled.

12 Emulsifying salts are used in varying  
13 amounts and usually contain a combination of  
14 salts, such as sodium phosphates and sodium  
15 citrates. But that all depends on the type of  
16 processed cheese product that is being produced.

17 Specifically, due to sodium  
18 phosphate's calcium binding properties, its  
19 higher emulsification of fat and stronger  
20 dispersion in hydration of milk proteins, it's  
21 used especially in the production of spreadable  
22 processed cheeses and powdered processed cheese.

1       Whereas, sodium citrates are used more commonly  
2       to produce sliceable and block-processed cheese  
3       products. But again, like I mentioned, these are  
4       generally used in combination but can also be  
5       used alone depending on the product that you're  
6       producing.

7                   IDFA's organic dairy companies produce  
8       a wide variety of processed cheese products,  
9       which are also used in ingredients in other  
10      organic foods, and they've also put significant  
11      time into finding a suitable organic replacement  
12      for sodium phosphates. But at this time, they've  
13      been unable to find a suitable replacement for  
14      the functional properties of sodium phosphates.

15                   Limiting organic processed cheeses to  
16      solely using citrates would reduce the  
17      flexibility and ability of organic producers to  
18      make a wide variety of processed cheese types,  
19      which have differing end product characteristics  
20      that meet consumer demands for a wider range of  
21      organic dairy products.

22                   I appreciate the opportunity to have

1 provided these comments to the Board.

2 MR. CHAPMAN: Thank you. Thank you  
3 very much. Up next is Jessica Walden, followed  
4 by Marianne Cufone. Sorry, I mispronounced that.  
5 Jessica, name and affiliation please.

6 MS. WALDEN: Jessica Walden from QAI.  
7 Hi guys. Thanks for this opportunity to comment  
8 and thanks for all the amazing work that you guys  
9 do, hours you put in.

10 QAI is one of the leading providers of  
11 organic certification services for organic  
12 production and handling operations and products.  
13 We submitted written comments to several  
14 proposals that came out of all the subcommittees.  
15 Today my comments will only address the CACS  
16 proposal on excluded operations in the supply  
17 chain and the Handling Subcommittee's proposal on  
18 the reclassification of potassium acid tartrate.

19 QAI supports the proposal for the  
20 excluded operations in the supply chain. We had  
21 a minor -- or suggested addition that -- under  
22 the recommendations section, that you mimic the

1 language in the regulation instead of saying an  
2 operation is excluded from certification, that  
3 you say an operation or portion of an operation  
4 is excluded from certification if, dot dot dot.

5 The other question -- my understanding  
6 of the proposal is that for non-retail containers  
7 that contain retail label product, they can still  
8 comply only with 307B, which includes the lot  
9 number. Is that right? But if the non-retail  
10 label does not have a retail label product inside  
11 of it, then it must comply with 303. Is that the  
12 right -- okay.

13 Okay, so I believe that, that proposal  
14 can be passed at this meeting with just that  
15 slight revision and there was also -- we support  
16 also some suggested revisions submitted by OTA.

17 We believe this is a -- the benefits  
18 far outweigh the cost in this and we support any  
19 action that will address and mitigate fraudulent  
20 activity in the organic industry.

21 Regarding the classification of  
22 potassium acid tartrate, we agree with the

1 subcommittee's proposal to change the  
2 classification from nonagricultural synthetic to  
3 agricultural nonsynthetic, and we're excited that  
4 you are making these determinations based on the  
5 guidance that came out of the NOP and the  
6 decision trees. The only suggestion we have  
7 there is in the -- maybe in the discussion of the  
8 recommendation or even in -- when the NOP makes  
9 the change, that it's clarified that any  
10 potassium acid tartrate that's produced from wine  
11 that can make the "made with organic" claim  
12 because of the use of sulfites would not  
13 constitute an organic potassium acid tartrate,  
14 and that's it.

15 MR. CHAPMAN: Thank you. Emily.

16 MS. OAKLEY: Thank you for your  
17 comments on eliminating the incentive to convert  
18 native ecosystems, and I noted that you had a  
19 proposed motion wording change. I was wondering  
20 what your thoughts were on the motion wording  
21 change provided by the Wild Farm Alliance.

22 MS. WALDEN: I -- can you tell me what

1 that is by the Wild Farm Alliance?

2 MS. OAKLEY: I don't have it right in  
3 front of me.

4 MS. WALDEN: Okay. I don't have it  
5 right in front of me either. Yes, our suggestion  
6 was to follow the IFOAM. So if it's similar to  
7 the IFOAM terminology, which is really just  
8 instead of -- I think, let me just quickly go to  
9 what the IFOAM-1 says, is that, "Farming or  
10 grazing areas installed on land that has been  
11 obtained by clearing of native ecosystem sites in  
12 the proceeding 10 years shall not be considered  
13 compliant."

14 So it's -- instead of -- the  
15 terminology that was there in the proposal was,  
16 you know, someone could convert to conventional  
17 and then convert to organic. So this just seems  
18 to solidify it but if the Wild Farm Alliance has  
19 similar terminology, then yes, we would support  
20 that.

21 MR. CHAPMAN: Thank you.

22 MS. WALDEN: Thanks.

1                   MR. CHAPMAN: Up next is Marianne,  
2 followed by Tracy A. Nazarro. You can start with  
3 your name and affiliation.

4                   MS. CUFONE: Hi there. My name is  
5 Marianne Cufone. I'm the executive director of  
6 the Recirculating Farms Coalition, an  
7 environmental attorney, and I was on the NOP  
8 Hydro Aquaponics Task Force.

9                   It's highly unfortunate how the  
10 conversation about hydro and aquaponic  
11 certification has developed into a name calling,  
12 finger pointing, divisive issue. Whether you  
13 grow food in the ground, in a raised bed or  
14 container, on a trellis in pebbles or other  
15 medium, we're all farmers.

16                   Many of us try to grow food in the  
17 best way we know how for us and our planet. And  
18 some of us grow and accord with existing legal  
19 organic standards, and for that, if we meet USDA  
20 organic standards, we should get a USDA organic  
21 label.

22                   The label isn't owned by any

1 particular group of farmers. While we appreciate  
2 those who've paved the way for the label, that  
3 doesn't make it exclusive. It's a government  
4 issued label and that should be available to any  
5 farm that meets the legally defined standards.

6 In line with this, I noted that the  
7 most common complaint about USDA organic  
8 certification for hydroponics and aquaponics is  
9 that they don't directly enhance the dirt on the  
10 ground. That's not actually true for a lot of  
11 these farms, but even if it was, then it is  
12 equally inappropriate to allow certification of  
13 farms that use the container method of growing,  
14 unless hydroponic and aquaponic farms can also  
15 earn certification. The soil in these containers  
16 does not touch the earth. The container option  
17 is no compromise. It's a specific exemption to  
18 allow dirt farming in raised beds.

19 That still leaves hydro and aquaponic  
20 growers with nothing. Some say organic is just  
21 about using dirt itself. This makes no sense.  
22 We have a recommendation from this very Board

1 pending with USDA to allow organic seafood, which  
2 has nothing to do with dirt on the earth. Some  
3 people may associate the term USDA organic with  
4 soil but most associate it with the cleanest or  
5 best method of production. Not all hydroponic  
6 and aquaponic farms are the same, just like not  
7 all in-ground or container farms are the same.

8 I'm extremely disappointed to hear and  
9 read sweeping generalizations about hydro and  
10 aquaponic energy use, inputs materials and other  
11 matters at this meeting. Much is inaccurate and  
12 thus irresponsible. For example, our farm in New  
13 Orleans grows entirely outdoors, uses only  
14 organic and heirloom seeds, runs almost entirely  
15 on solar power, relies mainly on rainwater and  
16 recirculates all the water and waste within our  
17 farm. We also grow in-ground and in raised beds.  
18 We don't refrigerate or ship our products and we  
19 reduce fuel usage too. We leave the world a  
20 better place and feed people.

21 In our world today, we need more  
22 responsible farmers, smarter resource use and

1 thoughtful production. Excluding hydro and  
2 aquaponic farms from organics is neither smart or  
3 appropriate. It takes away incentive for new and  
4 beginning farmers to be innovated for existing  
5 growers to versify their systems and to be smart  
6 about all resource use, not just soil.

7 Please don't take away the USDA  
8 organic label from farmers who earned it just  
9 because they chose to raise food through  
10 innovative hydro or aquaponics and let's stop  
11 being a hydro farmer, a dirt farmer, a container  
12 farmer and just all be farmers who are all  
13 eligible for the USDA organic label.

14 I brought a couple of pictures for you  
15 folks to look at because everybody's been  
16 questioning what these farms look at and I also  
17 just want to show you this last picture.

18 MR. CHAPMAN: Thank you, we'll have to  
19 move on. Any questions?

20 MS. CUFONE: Sure.

21 MR. CHAPMAN: Asa.

22 MR. BRADMAN: What do you feel about

1 labeling, and whether there should be a -- would  
2 a compromise on these issues be a label that was  
3 organic, hydro-organic, organic hydroponic, or  
4 aquaponic, some variation thereof? I'm not  
5 talking about the specifics. But --

6 MS. CUFONE: We talked about this on  
7 the task force. And there was an interesting  
8 consensus actually on both sides of the issue.  
9 Because as you saw that we were very, very split.

10 And the thought was, there could be a  
11 different label. But it needs to say USDA  
12 organics. So, it could be USDA organic  
13 hydroponic, USDA organic aquaponic. But we're  
14 all wanting that organic label. Because it's  
15 valuable.

16 MR. CHAPMAN: Thank you very much.

17 MS. CUFONE: Yes.

18 MR. CHAPMAN: Up next is Tracy  
19 Nazzaro. And following her is John Bobbe.  
20 Tracy, if you can start with your name and  
21 affiliation?

22 MS. NAZZARO: Great. Thank you. I'm

1 Tracy Nazzaro, with Traders Hill Farm. We are a  
2 commercial aquaponics farm in nearby Hilliard,  
3 Florida.

4 New and innovative farming technology  
5 such as hydroponics and aquaponics offer  
6 advantages over traditional farming methods in  
7 terms of sustainability and environment  
8 preservation.

9 At Traders Hill Farm, we use no  
10 pesticides, no herbicides. And our plant  
11 nutrients are 100 percent organic. As an added  
12 benefit, our production system utilizes less than  
13 10 percent water as compared to traditional  
14 ground farming.

15 My comments today address concerns  
16 regarding the ability for a commercial aquaponics  
17 facility to produce safe and clean food. Based  
18 on my direct experience at Traders Hill Farm, I  
19 will speak to the following.

20 One, the safety of our fertilizer  
21 nutrients are created via our aquaponic system.  
22 And two, enterprise-wide food safety protocols

1 that ensure the safety and quality of our  
2 produce.

3 First I would like to dispel a glaring  
4 misconception that commercial aquaponics  
5 applications are fertilizer that is our plants' -  
6 - nutrient source for our plants is not fish  
7 waste. It is not fish waste.

8 The fertilizer used in our production  
9 facility is nitrogen in the form of nitrates.  
10 The fish effluent is accrued product in our  
11 system that is converted to a nutrient source for  
12 our plants. And the process is quite  
13 straightforward.

14 Animal proteins, our fish, are housed  
15 in a completely separate and fully enclosed  
16 facility adjacent to our greenhouse. The fish  
17 effluent leaves the fish tanks and flows through  
18 multiple tanks that aid in filtration,  
19 sedimentation, and then a biological refining  
20 chemical conversion.

21 The filtered water is then  
22 biologically refined through the process of

1 nitrification. The same species of nitrifying  
2 bacteria found in ground farming and soil  
3 environments convert ammonia to nitrites then  
4 nitrates, the ultimate fertilizer for our plants.

5 Second, our food safety measures  
6 extend from our processes to our production floor  
7 and beyond. Our facility has extremely strict  
8 procedures for hygiene, and a multitude of food  
9 safety parameters in place to help minimize risk  
10 of contamination.

11 We have fully embraced the Food Safety  
12 Modernization Act of 2011, and maintain a Safe  
13 Quality Food Level 3 Safety Certification. We  
14 were the first aquaponics facility, and we  
15 believe the only aquaponics facility to achieve  
16 this level of food safety.

17 This level of certification requires  
18 annual third party inspection, comprehensive  
19 documentation of all processes, procedures, and  
20 maintenance, as well as traceability of product  
21 all the way from seed to customer.

22 Every Traders Hill Farm team member

1 takes the Safe Serve Food Handling course on  
2 their first day of employment. And we are proud  
3 to have nine HACCP certified individuals on  
4 staff.

5 Commercial hydroponics and aquaponics  
6 farming methods are responsible. And that should  
7 absolutely be allowed to pursue the USDA organic  
8 designation.

9 We and our fellow farmers are up to  
10 the challenge of meeting the stringent organic  
11 certification criteria, and should be afforded  
12 the opportunity to do so. Thank you.

13 MR. CHAPMAN: Thank you. Ashley.

14 MS. SWAFFAR: Are you currently  
15 certified organic?

16 MS. NAZZARO: We are not currently  
17 certified organic. Although we have put together  
18 a task force, because that is one of our goals.  
19 We're a young company, started in the end of  
20 2013. So, it is on our list of action items.  
21 Thank you.

22 MR. BRADMAN: Just the same question

1 I've asked many people. How do you feel about  
2 labeling?

3 MS. NAZZARO: So --

4 MR. BRADMAN: And would you accept an  
5 aquaponic label?

6 MS. NAZZARO: So, we are very proud to  
7 produce, to be aquaponic farmers. And we already  
8 include that on all our packaging. And we would  
9 continue to be amenable to do that. We would  
10 like the USD organic label. And we would do a  
11 sub note that we are -- that the produce was  
12 grown aquaponically. Absolutely.

13 MR. CHAPMAN: Thank you. Dave.

14 MR. MORTENSEN: Just curious. What  
15 would happen if you didn't have the organic  
16 label, and you were to say naturally grown  
17 hydroponic?

18 MS. NAZZARO: We would continue to  
19 produce in the exact same way that we are  
20 producing right now, in our very safe, clean,  
21 healthy manner.

22 MR. MORTENSEN: Okay. So, it wouldn't

1 put you out of business?

2 MS. NAZZARO: It would not.

3 MR. MORTENSEN: Okay. Thanks.

4 MR. CHAPMAN: Thank you very much.

5 MS. NAZZARO: Thank you.

6 MR. CHAPMAN: Up next is John Bobbe,  
7 followed by Andy Hudson.

8 MR. BOBBE: I'm John Bobbe. I'm the  
9 Executive Director of the Organic Farmers' Agency  
10 for Relationship Marketing.

11 USDA classified us in an article that  
12 we are the largest marketer of farmer-owned and  
13 controlled grain in the United States, with our  
14 member cooperatives in 19 states from Montana to  
15 Texas and Louisiana, and through Ohio, Tennessee,  
16 and Kentucky. Our farms range in size from 100  
17 to over 7,000 acres.

18 I want to address the issue of organic  
19 fraud. Based on my experience of having been  
20 traveling to the Ukraine to participate in the  
21 Organic Integrity Project, and also for 17 years  
22 in the Black Sea region.

1                   We wrote a letter to the Inspector  
2                   General of the USDA asking them to look at not  
3                   only what they were originally going to look at,  
4                   just European relations with the NOP, but non-  
5                   European countries.

6                   And we re-wrote that letter after the  
7                   Washington Post report uncovering the fraud. And  
8                   it said in that report that AMS was unable to  
9                   provide reasonable assurance that the NOP  
10                  required documents were reviewed at the U.S.  
11                  ports of entry.

12                  Now, we had dinner with a gentleman by  
13                  the name of Peter Whoriskey from the Washington  
14                  Post, that started the conversation. And I had  
15                  several conversations with him until his article  
16                  came out.

17                  And OFARM has uncovered by itself four  
18                  separate ship loads, not containers, ship loads  
19                  of 450 to 500,000 bushels of grain. Two of those  
20                  have been shown to be total fraud. Three of the  
21                  ships in the Whoriskey article were also all  
22                  fraud.

1           The most recent one that was suggested  
2 yesterday, we stopped the ship. Do you know how  
3 the NOP stopped the ship? Because our contacts  
4 in the U.K. told OFARM the ship was coming. And  
5 Miles McEvoy personally told me they had no clue.

6           And we turned it over. And it was  
7 actually APHIS that stopped the shipment. Or  
8 there would have been another corrupt shipment of  
9 grain coming into Bellingham, Washington.

10           There is not one country in the Black  
11 Sea region that can come up with one shipload of  
12 certified organic grain. And that includes  
13 Turkey, that does not produce one bushel of  
14 soybeans or corn certified organic. And they are  
15 the biggest exporter.

16           We're talking about complete fraud  
17 here. And a failure. I've made some  
18 recommendations that I made to the conference in  
19 Odessa about what should happen. We agree with  
20 many of them that were presented here yesterday.

21           And among them technologies to model.  
22 And also that we need to coordinate with the

1 European Union on their fraud initiatives. Thank  
2 you.

3 MR. CHAPMAN: Thank you, John.

4 Questions for John? Dave.

5 MR. MORTENSEN: Yes. The Panel  
6 discussion yesterday morning really, from my  
7 point of view, centered solely on software for  
8 tracking, which obviously is very important.

9 And it's also pretty obvious that  
10 that's going to take time for that to be  
11 developed. What other things in the short term  
12 should we be thinking about as a board?

13 MR. BOBBE: One would be international  
14 maritime laws. And that is a simple request:  
15 what's the cargo insured for? There's only one  
16 insurer in the world. And no insurer in their  
17 right mind is going to insure a conventional load  
18 of grain at twice the price.

19 International maritime law, as I  
20 understand it, also allows for seizure of  
21 shipments that do not reflect what's on the ship  
22 manifest. And that's exactly what was on the

1 manifest of the ship that Peter Whoriskey found  
2 the documents, the blatant documents that were  
3 altered on the way over here.

4 MR. CHAPMAN: Thank you.

5 MR. MORTENSEN: Thank you.

6 MR. CHAPMAN: Harriet.

7 MS. BEHAR: Hi, John. Do you think  
8 there's a way that we can work with the buyers  
9 here in the United States to provide actually a  
10 premium to the domestic producers? Because not  
11 only was there fraud, and our producers lost  
12 markets, but they -- it also drove down the  
13 price.

14 But I know that some buyers are  
15 looking for domestically produced. So, I'm  
16 wondering how we might be able to enhance that  
17 marketplace for domestic.

18 MR. BOBBE: Well, we, in our OFARM  
19 cooperative network, are discussing that.  
20 Because we do not deal in imported grain. We  
21 deal with 100 percent organic U.S. grown. And  
22 our producers are proud of that.

1           What's fallen down is on the NOP, and  
2           their attempts. Six months ago, before the NOP  
3           meeting in Denver, there was an NOP employee  
4           telling one of our people, there's no problem  
5           here. There's no reason for you to go to the  
6           NOSB meeting.

7           And then three weeks later, the  
8           Whoriskey article blows up in their face. So,  
9           yes, there has to be. We've been having  
10          discussions with our marketers, or have been on a  
11          day to day basis.

12          Consumers should be concerned, because  
13          this is massive fraud on the consumer end. We've  
14          had some inquiries about it. But this is going  
15          to be a long, slow process to change that around.

16          The damages to our producers run in  
17          the hundreds of millions of dollars. The biggest  
18          catastrophe in the history of organic in the U.S.

19                 MR. CHAPMAN: Sue.

20                 MS. BAIRD: Hi, John. I have heard  
21                 from some feed mills that without imports of  
22                 grains, there will not be enough supply of

1 organic grain. Can you address that, John?

2 MR. BOBBE: Yes. Now, let me make  
3 perfectly clear, we and OFARM are not opposed to  
4 imports. We are opposed to the rampant fraud  
5 that is blowing the prices down by one-third.

6 And, yes, we import about 70 percent  
7 of our soybeans, and about 40 percent of our  
8 corn. And the question for us as producers and  
9 organizations, but everyone, is: how do we get  
10 the industry to focus on, instead of relegating  
11 U.S. producers to being a residual --

12 Here's what the buyers tell us. You  
13 can bring your grain in, but we're bought out for  
14 three months, full of imports. You can bring it  
15 in, but fire sale it to us.

16 And what they're using is higher  
17 priced imports to beat down the domestic price.  
18 And the word from more than one buyer, as long as  
19 the piece of paper has the word "organic" on it,  
20 they accept it.

21 And the other question is, there's  
22 some certifiers here that got their hands dirty

1 on this one too, collecting a lot of money  
2 certifiying imports that were fraud. Because  
3 they can't trace the shipments off the back end  
4 of the ship.

5 Our farmers are entitled to the same  
6 fair treatment as the farmers in the other  
7 countries. A yearly inspection, an organic  
8 service plan, how that field was done, tracking  
9 from field all the way through.

10 And my guess is that the NOP or any of  
11 these certifiers couldn't track one single ship  
12 load back to where that was on equal treatment.

13 MR. CHAPMAN: Briefly.

14 MS. BAIRD: What would you suggest  
15 that we implement for a traceability tracking  
16 system from these foreign countries?

17 MR. BOBBE: Well, I think first of  
18 all, what the European Union has done, and that's  
19 a part of our recommendation here. That was a  
20 part of the memo, the guidance memo that we have  
21 been hammering on Miles McEvoy for about six  
22 months to do.

1           The other thing is, high risk  
2 countries, like the Europeans do. That if it's  
3 coming in -- right now, the NOP can't locate  
4 ships. They don't know where they're coming  
5 from. They don't have a clue. That's what Miles  
6 told me.

7           We need to have a system. Somebody in  
8 the U.S. Government is tracking those ships. How  
9 does that information get shared with the NOP?  
10 How do we have the appropriate people to follow  
11 through on the Inspector General's report that  
12 they're at the ports?

13           A bunch of farmers have got to get a  
14 message from England, and feed it to the NOP. So  
15 we have people meeting the ship in Bellingham,  
16 Washington. That doesn't speak very highly.

17           We've got business to do running the  
18 combines this time of the year, instead of  
19 worrying about fraudulent shipments of grain.  
20 And we need to follow what the Europeans are  
21 doing very closely.

22           In my comments is what they're doing

1 about their electronic tracking system. I do  
2 agree with the blockchain system. However, there  
3 are some other systems out there. It's being  
4 used extensively in Italy. But there are other  
5 countries in Europe that are looking at others.

6 And once the electronic certificates  
7 are in place that would allow, like in Europe,  
8 that before that ship is even loaded those  
9 documents are on the way to the NOP and the  
10 certifiers that this is going to happen. And if  
11 it doesn't meet the initial screening criteria,  
12 it doesn't go to the EU.

13 MR. CHAPMAN: Ashley, and we'll end it  
14 there.

15 MS. SWAFFAR: Thank you for your  
16 comments. Part of the Farm Bill, there was the  
17 Organic Farmer and Consumer Protection Act  
18 introduced. Do you think that that will help lay  
19 some of the groundwork for solving this problem?

20 MR. BOBBE: It could. I have not  
21 looked specifically at it. There's another one,  
22 the Fazio bill that may. What we need is

1 certification of buyers, traders, importers.

2           There's one company that's a common  
3 thread through all these ships, almost all of  
4 them that we can verify. They're not certified.  
5 We know that. And so, they're running through  
6 the cracks. They're not even on the NOSB or the  
7 certifiers' radar screen to do this.

8           MR. CHAPMAN: Thank you. Thank you,  
9 John.

10           MR. BOBBE: Thank you. And we  
11 appreciate, I learned a lot from the Panel  
12 yesterday about how this might work. And I'm  
13 sure our farmers are going to have some ideas and  
14 suggestions for --

15           MR. CHAPMAN: Thank you.

16           MR. BOBBE: -- members of the NOSB.

17           MR. CHAPMAN: Thank you, John. I  
18 encourage your farmers and members to utilize the  
19 open docket to get that to us. And you have my  
20 contact information as well.

21           MR. BOBBE: Thank you.

22           MR. CHAPMAN: Up next is Andy Hudson,

1 followed by Christopher Pierce. Andy, if you can  
2 start with your name and affiliation?

3 MR. HUDSON: Good morning. My name is  
4 Andy Hudson. And I'm the Director of Quality  
5 Control, and Senior Research Scientist at  
6 Westbridge Agricultural Products.

7 And we are here, I'm just here to talk  
8 a few minutes about the sunset review of soap  
9 based herbicides in non-production agriculture.

10 To be clear, Westbridge does support  
11 the continuation of the current classification,  
12 but we would strongly oppose the expansion of  
13 these synthetic products into crop growing areas.

14 I submitted a written comment on this  
15 issue in late October, and on behalf of  
16 Westbridge. And this oral comment is to  
17 recapitulate and expand on the two main points on  
18 that submission.

19 My first point was and is that salts  
20 and fatty acids are synthetic materials as  
21 defined by the NOSB. In addition, herbicidal  
22 soaps should not be considered analogous to

1 insecticidal soaps.

2 Insecticidal soaps are potassium soaps  
3 of naturally occurring, even-numbered fatty  
4 acids. While herbicidal soaps are ammonium soaps  
5 of odd-numbered fatty acids, which are not  
6 naturally occurring.

7 Okay. The slide that's showing now  
8 illustrates a common method. Oh, no. The slide  
9 that's showing now shows the differences between  
10 the even-numbered fatty acids with a potassium  
11 counterion, versus the odd-numbered fatty acids  
12 with an ammonium counterion.

13 The slide that's showing now  
14 illustrates the common method for the  
15 manufacturer of herbicidal soaps. The general  
16 process involves oxidizing a long chain fatty  
17 acids, and under the proper conditions and with  
18 the proper catalyst, will result in several small  
19 chain fatty acids as products.

20 Nonanoic acid is one of these derived  
21 small chain fatty acids. In addition, the  
22 synthetic ammonium cadiron used in the

1 manufacture of these herbicidal soaps is a non  
2 organic form of nitrogen that is being applied to  
3 organic soils. And I don't think that that  
4 should be disregarded.

5 The second point in my written comment  
6 discussed a viable organic alternative for weed  
7 control in crop growing areas that was not  
8 mentioned in the other comments submitted. They  
9 did mention the flaming and the hand weeding,  
10 which are both very intensive in labor, and very  
11 expensive.

12 But there is an organically approved  
13 material for application in organic crop growing  
14 areas. Suppress is a contact, post-emergence  
15 herbicide with activity against dicots, monocots,  
16 and sedges.

17 Crop plant back can be performed as  
18 soon as one day after application. And it has a  
19 zero day pre-harvest.

20 MR. CHAPMAN: Thank you very much.

21 Emily.

22 MS. OAKLEY: Do you have any concerns

1 about the current annotation that allows for  
2 insecticidal soap use in ditches, since there is  
3 a known toxicity, both moderate and high  
4 depending upon the organism of aquatic species?

5 MR. HUDSON: What was the last part of  
6 that?

7 MS. OAKLEY: There's -- sorry.  
8 There's a known toxicity for aquatic animals with  
9 this product. So, do you have any concerns about  
10 its use in ditches where there may be --

11 MR. HUDSON: Well they --

12 MS. OAKLEY: -- standing water and --

13 MR. HUDSON: They will then say to  
14 avoid any situation in which it would hit surface  
15 waters, or contamination of waters. And the  
16 label very explicitly states that it needs to be  
17 shielded sprayers.

18 It is non specific. So, the label  
19 does call that out. And we have recently  
20 received some data that the, it does have -- it  
21 doesn't have any impact on like honey bees, and  
22 so forth at field use rate.

1 MR. CHAPMAN: Thank you very much.

2 MR. HUDSON: Okay.

3 MR. CHAPMAN: Up next is Christopher  
4 Pierce, followed by Keith Kandt. Christopher, if  
5 you could start with your name and affiliation?

6 MR. PIERCE: Good morning. My name is  
7 Chris Pierce. I am the President of Heritage  
8 Poultry Management Services. We're located in  
9 Annville, Pennsylvania.

10 Heritage provides management services  
11 for over 50 small family organic pullet and egg  
12 farms in Pennsylvania. And we're currently now  
13 celebrating our 20th year of certification of  
14 organics.

15 And I've shared with this Board many  
16 times over the years on a variety of topics at  
17 previous NOSB meetings that included various  
18 topics on poultry discussion. I believe the  
19 opportunity for public comment to this board is  
20 crucial to the success of the program.

21 I want to thank each of the current  
22 board members for your time, your energy, your

1 commitment to uphold the integrity of the NOP  
2 program through the, which is a critical part of  
3 the USDA process.

4 The diversity of this board coming  
5 together to discuss and come to a unified  
6 decision point with high and low profile topics  
7 is honored and appreciated by me.

8 I also value the opportunity to be  
9 here today to represent our small pool of organic  
10 farmers. Because they're busy caring for the  
11 birds and running their farms. And it's hard for  
12 them to travel like it is for me.

13 So, a couple of things I want to talk  
14 about is the petition to add the elemental sulfur  
15 to the National List for use for livestock  
16 production, as a livestock parasiticide.

17 As organic egg farmers we partner  
18 with, we've implemented the practices already  
19 that comply with the OLPP, Organic Livestock and  
20 Poultry Practice Rule that this body was very  
21 instrumental in moving forward.

22 So, for us that are genuine organic

1 farmers that have birds out on pasture, we have a  
2 higher risk factor now than we ever have been.  
3 And we're looking for those tools in our toolbox  
4 that can help us deal with the exposure that we  
5 face when have the parasites like mites, and  
6 fleas, and ticks.

7 And with the time that they're  
8 spending out in pasture in the various areas of  
9 the country that is really critical. So, our  
10 toolbox has some tools that are missing.

11 And I know that the Livestock  
12 Subcommittee has voted in favor, I understand, of  
13 adding this to the National List. And I just  
14 want to support that we believe that is a good  
15 tool to add.

16 I also want to discuss the continued  
17 listing and allowance of chlorine materials to  
18 the National List. Our farms are on something  
19 called the Pennsylvania Egg Quality Assurance  
20 Program, which is the highest risk reduction for  
21 salmonella in the country. It's much higher than  
22 our FDA program has.

1           And a big part of that is sanitation.  
2           It's practices that we follow on the farm between  
3           flocks. We clean out. We disinfect. And we  
4           want to produce good, safe food. And we want to  
5           have the tools to be able to do that. So, I want  
6           to support that, the Subcommittee's continuation  
7           of listing that on the National List.

8           Lastly, I'd like to ask Dr. Tucker and  
9           all of USDA to proceed with the implementation of  
10          the OLPP rule effective November 14th, 2017, the  
11          month we're in right now, without any further  
12          delay.

13          A significant amount of organic  
14          poultry farmers had already made the updates to  
15          their operations to meet these standards, which  
16          would be expected to be implemented on March the  
17          20th.

18          But the rule had gone through the  
19          various processes of federal rulemaking, had tens  
20          of thousands of comments in support of this  
21          rulemaking, and it was approved.

22          So, the future of integrity of

1 consumer confidence in the organic seal is  
2 dependent upon this rule being implemented as  
3 written. Thank you.

4 MR. CHAPMAN: Thank you. Any  
5 questions? Ashley.

6 MS. SWAFFAR: Thank you, Chris, for  
7 your comment. On the sulfur issue, I know it's  
8 pretty rare for a flock to get mites. But if you  
9 have -- I want to know if you've had experience  
10 with flocks in the past mites in organics.

11 MR. PIERCE: Yes.

12 MS. SWAFFAR: And what you've done,  
13 and if it was effective.

14 MR. PIERCE: It's a challenge. So,  
15 sulfur can be a feed ingredient. So, it's okay  
16 for the bird to have it as a feed ingredient.  
17 But it's not -- I believe so.

18 But like diatomaceous earth, there's  
19 not a lot of tools out there. And I'll be honest  
20 with you. In the last couple of years now, as we  
21 have transitioned into pasture, this has been an  
22 evolution.

1           There are times that we're dealing  
2 with challenges. We're dealing with mites. And  
3 we don't want the organic birds -- And we also  
4 don't want them to suffer. So, there's more of  
5 an exposure in different regions of the country.

6           There is something call the northern  
7 fowl mite. It is a relative of the deadly red  
8 mite that the European poultry industry is in  
9 total chaos right now.

10           There's something called Fipronil. I  
11 won't talk about it a whole lot right now. But  
12 there's an insecticide that has devastated the  
13 western European Union's poultry industry. And  
14 that was in result to trying to find a tool to  
15 deal with this red mite.

16           We do not have red mites. We have  
17 northern fowl mites. We're looking for natural  
18 remedies. We're not asking for insecticides  
19 like, we're trying to do things right.

20           So, we do not have tools right now to  
21 deal with this problem. So, there's not an  
22 alternative. Oh, just use Coca-Cola on them.

1 Like, there's nothing crazy out there that would  
2 -- And that probably wouldn't be allowed either.  
3 But there's nothing crazy right now.

4 MR. CHAPMAN: There's phosphoric acid  
5 in there. Any other? Thank you very much.

6 MR. PIERCE: Thank you. Thank you,  
7 Board.

8 MR. CHAPMAN: Up next is Keith Kandt,  
9 followed by Marty Mesh.

10 MR. KANDT: Thank you. My name is  
11 Keith Kandt, representing Nature Sweet Tomatoes.  
12 And I'd like to speak on the issue of hydroponic  
13 growing.

14 So, you've heard all this and that  
15 about this biology versus that biology. And I'm  
16 going to let a lot of smarter people -- people a  
17 lot smarter than me talk about all that.

18 But what I'd like to do is take a step  
19 back, and really think about what we're really  
20 trying to accomplish here.

21 In 1787, a group of founding fathers  
22 gathered to form a new Government. These

1 individuals agreed on really almost nothing.  
2 They had very different backgrounds, different  
3 personalities, different pet issues, very  
4 different views.

5           So, that probably sounds pretty  
6 familiar to you about now. After a lot of work  
7 though the result was the U.S. Constitution. And  
8 they did some very, very smart things. And one  
9 of the smartest things they did was recognize  
10 that they couldn't see the future.

11           They understood they couldn't foresee  
12 the issues, and the technologies, and the new  
13 learnings that would come along. So, they built  
14 into that Constitution a provision for amending  
15 and interpreting it, for adapting as new  
16 information became available, or as new issues  
17 arose.

18           You have the rare opportunity to stand  
19 on their shoulders. Clearly, hydroponic growing  
20 wasn't top of mind in the early '90s, as the  
21 legislation creating the organic program was  
22 born.

1           But within that law is an insight in  
2           the spirit of those founding fathers. And that  
3           is that a practice will be permitted unless it is  
4           determined that such practice would be  
5           inconsistent with the permitted or applicable  
6           organic certification program.

7           So, those writers understood they did  
8           not have the foresight to know where those  
9           advances in growing would go. You have the  
10          opportunity 25 plus years later to see the  
11          landscape that they couldn't see, and to peek  
12          into the future as well.

13          So, please take your encouragement  
14          from those founding fathers, and use the gift  
15          that they gave us, the gift to change and to  
16          grow, no pun intended.

17          Certainly, fiercely protect the spirit  
18          and legacy of the organic movement, much of which  
19          is represented here in this room. But don't let  
20          us get stuck in the mud. Okay, that pun was  
21          intended. So --

22          Anyway, please be visionary. The

1 founding fathers would be disappointed if we  
2 aren't willing to revisit and adapt, after they  
3 gave us that gift to do so.

4 Hydroponics and soil grown organics  
5 have lived side by side for 25 years. And third  
6 party research shows that consumers are not  
7 concerned about the growing method used. And I  
8 can provide that research to you if you don't  
9 already have it.

10 So, I ask you to give growers the  
11 freedom to pick the growing method that works  
12 best for the quality of their soil, the hostility  
13 or not of their weather, and their own belief  
14 systems. So, thank you very much for your time  
15 and your work on this.

16 MR. CHAPMAN: Thank you. Asa, Joelle.

17 MR. BRADMAN: The same question I've  
18 asked people on both sides. Are you comfortable  
19 with a label that would call out a hydroponic --

20 MR. KANDT: Got you. Yes.

21 MR. BRADMAN: -- container? Yes.

22 MR. KANDT: My recommendation is that

1 we not do that. And that doesn't come out of a,  
2 it's not, it comes out, it doesn't come out of a  
3 place of my way or the highway.

4 It comes out of that research that I  
5 mentioned a few minutes ago, and the research  
6 that I presented to this group about a year ago.  
7 Some of you may remember it. Some of you I'm  
8 sure weren't even here.

9 But in that research we asked  
10 consumers about how important it was whether the  
11 product was grown in the soil, or whether it was  
12 hydroponically grown. After we introduced the  
13 idea of hydroponics to them we asked them if that  
14 made a difference.

15 And overwhelmingly they said, no, it  
16 doesn't make any difference. Read my lips. The  
17 part I'm worried about is: no chemicals in my  
18 food. Of those that did care, more, most of them  
19 found hydroponics as either being a positive, or  
20 at the very least intriguing. And very few found  
21 hydroponics to be a negative when thinking about  
22 organic.

1                   So, what I think you have the  
2 potential to do is to create confusion where none  
3 exists right now. And five years from now we'll  
4 be back here trying to figure out what to do with  
5 that confusion that now exists.

6                   I wouldn't say absolutely I won't do  
7 it. But I would recommend you don't.

8                   MR. CHAPMAN: Thank you. Joelle.

9                   MS. MOSSO: First I'd ask that you do  
10 send that research from the survey.

11                  MR. KANDT: I would be happy to send  
12 that to you, if you --

13                  MS. MOSSO: Yes. My second question  
14 is in regards to your substrate that you grow in.

15                  MR. KANDT: Okay.

16                  MS. MOSSO: If you could, you know,  
17 elucidate what that is.

18                  MR. KANDT: It's coco, coco coir.

19                  MS. MOSSO: Solely? It's 100 percent?

20                  MR. KANDT: You're talking to the  
21 marketing guy. So --

22                  MS. MOSSO: Got you.

1 MR. KANDT: I can't swear to that.

2 MS. MOSSO: Okay.

3 MR. KANDT: I can get an answer for  
4 you though if you want to get more specific.

5 MS. MOSSO: I appreciate it.

6 MR. KANDT: I'd be happy to supply it.

7 MS. MOSSO: Yes. Thank you.

8 MR. KANDT: Okay. Thanks.

9 MR. CHAPMAN: Dave.

10 MR. MORTENSEN: Keith, what about, so  
11 following on Asa's question. What about it not  
12 being labeled officially organic, but naturally,  
13 sustainably raised produce?

14 MR. KANDT: Something along those  
15 lines --

16 MR. MORTENSEN: Yes.

17 MR. KANDT: -- instead of organic?

18 MR. MORTENSEN: Yes.

19 MR. KANDT: I think, when I mentioned  
20 that there doesn't seem to be a lot of confusion  
21 with the organic label, I can't say the same for  
22 terms like natural and naturally grown, and all

1 those sorts of things.

2 Everything I read, and when I do talk  
3 to consumers, it is very clear that nobody quite  
4 knows what those mean. So, I think that would  
5 really be stepping into an area where consumers  
6 would just say, you know, I'm throwing up my  
7 hands. I don't know what that means.

8 MR. CHAPMAN: Asa, and then we'll stop  
9 it there.

10 MR. BRADMAN: Can you describe your  
11 practices in terms of how materials are re-used,  
12 how they're recycled? Is there any sort of crop  
13 rotation, bio-diversity, any information about  
14 that, those issues?

15 MR. KANDT: About? I didn't hear the  
16 first part of the question.

17 MR. BRADMAN: Well, just related to  
18 practices. Is there any re-use of materials,  
19 recycling, composting? Is there any linkage to  
20 outdoor production? What's your system?

21 MR. KANDT: Okay. Our system is  
22 totally indoors. We don't have any outdoor

1 production. We do recycle. You know, we have a  
2 lot of foliage, a lot of leaves and so forth that  
3 do get composed.

4 I can't give you the details of that  
5 off the top of my head. But I could provide a  
6 little more information on that if you'd like.  
7 Let me see, what's a couple of the other pieces  
8 of your question? Give me a --

9 MR. BRADMAN: What happens to  
10 materials used in the production? And then also,  
11 crop rotation? How your facility may or may not  
12 contribute to bio-diversity?

13 MR. KANDT: Okay. I think I'd  
14 probably be better off giving you an answer to  
15 that privately, and giving you better facts.

16 MR. BRADMAN: Thank you. But anything  
17 you provide should go --

18 MR. KANDT: Okay.

19 MR. BRADMAN: -- to the whole board.

20 MR. KANDT: Okay. Yes. No. I'm not  
21 trying to skirt your question. I just don't want  
22 to give you wrong information.

1           MR. CHAPMAN: You can follow-up with  
2 Michelle, and she'll get it to the board members.  
3 Thank you for your time.

4           MR. KANDT: Okay.

5           MR. CHAPMAN: Up next we have Marty  
6 Mesh, followed by Melinda Mayfield-Davis. Marty,  
7 if you could start with your name and  
8 affiliation?

9           MR. MESH: Marty Mesh, Florida Organic  
10 Growers and Quality Certification Services. And  
11 our farm was Bellevue Gardens Organic Farm, that  
12 we farmed on a large scale in '76. I started  
13 farming organically in '72 -- at the end of '72.

14           So, I've seen a lot of history, and a  
15 lot, I've had the pleasure of seeing this sector  
16 of the industry grow. QCS has admitted technical  
17 comments.

18           So, and if you wanted to ask about  
19 free beer tonight, then ask me in the Q&A.  
20 Because I don't want to waste my three minutes.  
21 If you want to ask me about hydroponic history, I  
22 can give you some of that as well, and answer

1 some of the comments that were done before.

2 But one of the comments I want to make  
3 sure I get in in my short time is to ask to delay  
4 the vote on fatty alcohols.

5 You know, we believe that a lot of  
6 growers in the south didn't have time. We know  
7 that they couldn't sign up for comments. Because  
8 the recommendation came out when the comment  
9 period was already filled up. So, they couldn't  
10 get here, you know, they couldn't come and be  
11 here to tell their story, and to ask for it.

12 So, we would respectfully ask that you  
13 give farmers a chance to show up, as well as some  
14 other technical people that may have some input  
15 on it, but also couldn't get a spot to do it.

16 And then, I think the hydroponic thing  
17 is really, this whole meeting has really been  
18 difficult for me to hear, and the comments about  
19 that.

20 And thank you to Francis. That was  
21 the other thing on my list. You've been a  
22 wonderful addition to the board. And thank you

1 for your service. And all the board, as well as  
2 the program.

3 I think we underestimate the, we know  
4 how much the board works. But the program is  
5 there working as well. And so, my thanks to the  
6 staff of the program, as well as all the board  
7 members.

8 You know, I heard comments about, how  
9 did we get into this mess? And I'm happy to give  
10 a little bit of history or, you know, where did  
11 this come from?

12 I will tell you that in 1996 at that  
13 board meeting here in Florida, in Orlando, I was  
14 there really to convince the Board not to list  
15 Chilean nitrate, you know. I was totally against  
16 it as a farmer. Totally against it.

17 You know, it's salt laden fertilizer,  
18 not good for earthworms. I had a great public  
19 comment there. And then hydroponics was  
20 introduced. And I lost the Chilean nitrate vote  
21 by one vote on the board. The unanimous I think  
22 was referred to later on, on the hydroponics one.

1                   Here's the people that I remember that  
2                   were on the board. You know, when you talk about  
3                   all of these, or these big corporate people. Tom  
4                   Stoneback, Rodale Farms, Rodale Institute.  
5                   Donald Kinsman, American Meat Council.

6                   Craig Weakley, Muir Glen Farms.  
7                   William Friedman, New Mexico Organic Commodity  
8                   Commission. Michael Sligh was Chair of the board  
9                   at that point in time. The Board Chair from  
10                  RAFI. Dean Eppley, Pleasant Home Farm. Gene  
11                  Kahn, Cascadian Farms. Kay Chamerlain, I think  
12                  it was, Texas Plant and Soil Lab.

13                  So, with that, I can give you those,  
14                  Kathleen Merrigan's on there, Bob Quinn. You  
15                  know, it wasn't corporate people that weren't  
16                  interested in truly seeing the future of organic  
17                  --

18                  MR. CHAPMAN: Thank you.

19                  MR. MESH: -- agriculture or organic  
20                  growth.

21                  MR. CHAPMAN: Thank you, Marty. I  
22                  will rarely go first, and ask you to talk a

1 little bit about the history of the hydroponic  
2 issue. And then we have Harriet.

3 And if someone tries to steal the beer  
4 question, don't do it. I'm also -- I'm reserving  
5 that one for the end. Okay. Jesse, Dave, were  
6 you also? No. Okay. So, if you could explain a  
7 little bit more about the history? That was my  
8 question.

9 MR. MESH: Of the free beer? Can I?

10 MR. CHAPMAN: No, no. We'll come to  
11 the free beer at the end. Don't worry about that  
12 one.

13 MR. MESH: Okay.

14 MR. CHAPMAN: History of the  
15 hydroponic debate. Yes. I think you're at the  
16 end of --

17 MR. MESH: So yes. Fred Kersherman  
18 (phonetic), Mark -- We all know Fred. We all  
19 know Michael. I mean, Margaret Wittenberg, Bob  
20 Anderson, Walnut Acres. Bob Quinn, Margaret  
21 Clark. I mean, those were the people that I  
22 remember at the Orlando meeting.

1                   And it was a unanimous vote. They all  
2 were in agreement that this is -- And I was  
3 floored. I mean, I was a dirt farmer, you know.  
4 That's what our farm did.

5                   So, the idea of -- And then, to fast  
6 forward a little bit, that was in '96.  
7 Certifiers of course, you know, the languishing  
8 of the proposal, the first proposal, this or  
9 that.

10                   We were responding to a growing  
11 industry, a market demand. And so, you know,  
12 certifiers started certifying. If the board, you  
13 know, our language was, if the board said this is  
14 going to happen, then it's going to happen.

15                   And if it's taking that long, then  
16 let's just get out in front and run with it.  
17 There's not a final regulation yet. That will be  
18 included in there.

19                   So, CCOF obviously, you know, we  
20 certified hydroponic operations back then. But,  
21 you know, seaweed, fish emulsion, kelp, the same  
22 inputs that some of the other growers are using.

1                   Again, I come from a dirt farm, the  
2                   same farm background, chicken manure. So, you  
3                   know, I'm not a proponent of hydroponics. I'm  
4                   just giving you the history of it.

5                   MR. CHAPMAN: Thank you. Harriet.

6                   MR. MESH: And by the way, USDA at  
7                   that point in time was, you know, it was okay,  
8                   2002, let's grow this industry. Let's grow this  
9                   industry. And so, they were about growing the  
10                  industry, not so much about developing standards.

11                  MS. BEHAR: So, I have a question  
12                  about the fatty alcohols. Do your growers want  
13                  to use it for tobacco, or for other crops?

14                  MR. KANDT: You know, and here again,  
15                  you know, I don't take a position on tobacco. I  
16                  don't smoke. I'm a anti-smoker. But tobacco is  
17                  a crop. I could give you a history about okra in  
18                  the south, the whole okra thing.

19                  But they do want to use it on tobacco.  
20                  And they're growing certified organic tobacco  
21                  without any of the chemicals that are put in post  
22                  harvest in cigarettes, I guess, and whatever

1 that's, you know. But, yes, that's what it's  
2 for. And they're the ones that wanted to come  
3 speak.

4 MR. CHAPMAN: Jesse.

5 MR. BUIE: You mentioned delay in  
6 fatty alcohol. Is Tom here? Is he --

7 PARTICIPANT: I don't know if he's  
8 coming. He's gone to the --

9 MR. CHAPMAN: Yes. He's on the  
10 speaking list later.

11 MR. BUIE: Okay. Okay.

12 MR. MESH: I just know that we certify  
13 some seven tobacco growers. And so, that's what  
14 I was speaking on.

15 MR. CHAPMAN: Thank you. And, Marty,  
16 free beer. Tell me more.

17 MR. MESH: So, tonight from whatever -  
18 - Michelle may know better than me. I think it's  
19 7:00 p.m. It's whenever you end the meeting.  
20 Thirty minutes after you end the meeting. No  
21 pressure, Tom.

22 But it's right down the road. You can

1 walk there, 20 minute walk. It's -- and there's  
2 some flyers out front that Michelle and I put on  
3 the table. And there's some food, and beer, and  
4 stuff like that.

5 MR. CHAPMAN: Thank you, Marty.

6 MR. MESH: And you can take a boat  
7 taxi and get out on the river.

8 MR. CHAPMAN: Thank you, Marty. I  
9 don't run this meeting. I just herd cats. Up  
10 next is Melinda, and after that is Gwendolyn  
11 Wyard. Melinda, if you can start with your name  
12 and affiliation for the record?

13 MS. MAYFIELD: Hi. Thanks for  
14 listening. I am Melinda Mayfield. And I'm a  
15 licensed veterinarian, and a WIN certified health  
16 professional for animal health.

17 And we have a petition to include  
18 hypochlorous. I know it's already included as a  
19 surface disinfectant. I get inquiries quite  
20 often when I, either from email or our social  
21 media, on organic farmers wanting to know if our  
22 product is certified organic.

1           Some of the benefits of hypochlorous  
2 over the currently approved therapies, the  
3 research behind it. There's multiple studies on  
4 hypochlorous that prove its effectiveness and its  
5 safety. Many of the organically approved  
6 therapies lack the scientific data.

7           Speed of activity, I know honey is one  
8 we also compare it to. And the hypochlorous has  
9 a 15 second kill time, with a seven log  
10 reduction. Where if you look at honey, it often  
11 takes up to 24 hours to even receive a six log  
12 reduction.

13           The other benefit is versatility.  
14 hypochlorous with our product can be used in the  
15 eyes, the ears, and the mouth. It's safe if  
16 licked or ingested. It also kills bacteria,  
17 funguses, viruses, and yeast. So, it's very  
18 versatile.

19           And the availability. Many of the  
20 farmers in a rural area have trouble actually  
21 obtaining some of the approved therapies.  
22 They're not as in wide use. Whereas,

1 hypochlorous is widely available, even at a lot  
2 of the farm stores and things. Then can acquire  
3 it if they need it in an emergency.

4 A brief review is, also hypochlorous  
5 can be used in all areas of tissue management and  
6 wound management, like infection control,  
7 moisture management, edge advancement.

8 Studies prove that hypochlorous does  
9 increase fibroblast migration, which will speed  
10 up the healing. Many of the organic therapies  
11 can leave a residue. Some of them can be  
12 sensitizing. And there's really not scientific  
13 data to support a lot of those.

14 Like I said, kill time is very good,  
15 15 seconds, with even MRSA, pseudomonas, e coli,  
16 tricophyton, the ringworm, and even the  
17 parvovirus.

18 The National Center for Complementary  
19 and Integrative Health, we talked with them.  
20 They're mainly in human health. But like they  
21 said, they also said there's just not enough  
22 scientific data, even with aloe, to say that they

1 can definitely say it does help with wounds.

2 We know that there has been some  
3 anaphylaxis reaction with chamomile. St. John's  
4 wort has been proven to have sensitivity. So,  
5 really the scientific data, as a veterinarian I  
6 like to have data. And a lot of veterinarians  
7 do. So, I think some data behind it definitely  
8 encourages more veterinaries to use it.

9 So, here's some of the in vivo studies  
10 they've done on hypochlorous. And those are in  
11 the packets. I have packets for you all. But  
12 you can look at them more in depth.

13 And it shows that the effectiveness  
14 against MRSA and biofilm, which biofilm is  
15 important now. And just to go back, very  
16 widespread, the use of fungus. It is a chlorine.  
17 So, it's more of an electrolyte type solution.  
18 And I know some electrolytes are approved for  
19 use.

20 I did talk with Dr. Karreman, who was  
21 on this Board previously. And he has used  
22 Vetericyn. And we also -- the pinkeye study we

1 did, if you look at it, one of the things that  
2 really was encouraging to me is that it not only  
3 cleared up the pinkeye, but it had a 60.8 percent  
4 reduction in pain scores on those CADs.

5 And as an animal steward, I think one  
6 of the things that's important for us is to  
7 reduce pain and suffering in the animals. And  
8 the hypochlorous can do that, not only in the  
9 pinkeye, but also in wounds and burns.

10 MR. CHAPMAN: Thank you. Questions?

11 MR. BRADMAN: I just have one quick  
12 question. I know Albert Straus, from Straus  
13 Dairy in Petaluma, a really long esteemed dairy  
14 farmer and organic. Have you talked with him at  
15 all? And do you have any information about his  
16 impressions, beyond just the very short comment  
17 he made in the --

18 MS. MAYFIELD: I have talked to his  
19 various dairy farmers. And like I said, I've  
20 been on the phone with some of them. I talked to  
21 one this morning. And they've used some of the  
22 protocols. Some of them have good luck with it.

1           Like I said, my biggest deal, I'm in a  
2 very rural area of 3,000 in the community. And  
3 so, some of these are very hard for them to get a  
4 hold of. They like the idea of having something  
5 that's a wide range of use, that's not just for  
6 pinkeye, and not just for wounds.

7           And like I said, we've done all the  
8 studies. There is no residue in the tissue, no  
9 residue in the milk. So, it's very safe. In the  
10 environment it just breaks down into basically  
11 water and salt.

12           Like I said, there is a little bit of  
13 need out there, when I talked to the producers.  
14 And there has been, at all the seminars --

15           MR. CHAPMAN: Thank you very much.

16           MS. MAYFIELD: -- I go to, the Dairy  
17 Bill, they ask --

18           MR. CHAPMAN: Thank you. I'm going to  
19 have to cut you off there. Thank you very much  
20 though. I'm not seeing any other questions. Up  
21 next is Gwendolyn Wyard, followed by Jenny Cruse.

22           MS. WYARD: All right. Well, good

1 afternoon, NOSB Members, NOP staff, and ladies  
2 and gentlemen of the gallery. My name is  
3 Gwendolyn Wyard. I'm the Vice President of  
4 Regulatory and Technical Affairs for the Organic  
5 Trade Association.

6 And I'm estimating that all of you  
7 collectively, since the last meeting, have put in  
8 approximately 4,260 hours, which breaks down to  
9 177.5 days, during which time you produced a 177  
10 page packet that you turned over to us to deal  
11 with.

12 On our side, in less than 30 days we  
13 spent approximately 300 hours of membership  
14 engagement, research, and writing, that produced  
15 67 pages of comments, and a 44 page resource  
16 booklet.

17 And so, now in less than three  
18 minutes, I'm going to quickly run down the list  
19 of topics that I covered. And in a very  
20 abbreviated fashion ask: do you have any  
21 questions?

22 So, organic seed proposal. There's

1 two proposals in the document. And the motion is  
2 to accept all additions as described in the  
3 proposal.

4 You can separate out the proposal for  
5 regulatory change, or the motion for -- proposal  
6 for regulatory change for -- from guidance. If  
7 you can do that, then we urge you to pass the  
8 proposal that would require continuous  
9 improvement in sourcing and use of organic seed  
10 at this meeting.

11 And then take the proposal on the  
12 guidance piece back to subcommittee for  
13 additional work. And we've detailed all the  
14 reasons in our comments for the additional work  
15 that's needed.

16 Excluded operations. We believe that  
17 a regulatory change that will limit the types of  
18 operations, also known as, traders, brokers, et  
19 cetera, that may be excluded from certification,  
20 is the most important step that must be taken.

21 But we also strongly support the  
22 proposal on guidance, training, and certifier

1 oversight. And we really look forward to working  
2 with you on future actions we know you are yet --  
3 that are yet to come.

4 Excluded methods terminology. Based  
5 on our best review of definitions we believe that  
6 cisgenesis, intergenesis, and agro filtration  
7 should all be classified as excluded methods.

8 But our request is that the proposal  
9 be revised to actually include definitions for  
10 those terms in the proposal, to make sure that  
11 we're all talking the same language.

12 Potassium acid tartrate, also known as  
13 cream of tartar, yes. Classify as agricultural.  
14 Great move. Way to use the classification of  
15 materials guidance that is near and dear to my  
16 heart.

17 There are few things in this world  
18 that I like more than a perfect meringue. And I  
19 do hope that in the near future I'll be able to  
20 buy organic cream of tartar.

21 2019 Sunset, based on our survey  
22 results we believe that all of those materials

1 should be re-listed because of the lack of  
2 natural or organic alternatives.

3 The one that we're struggling with is  
4 konjac flour. I'm having a hard time getting the  
5 information that we need on that. One  
6 consideration is to go ahead and vote for its  
7 removal, knowing that we'll have another  
8 opportunity to comment when the proposed rule  
9 comes out.

10 And the finally, on seed purity  
11 standard. Tough but critical issue. Thank you  
12 for keeping it on the agenda. Keep the good work  
13 up. Thank you. Any questions?

14 MR. CHAPMAN: Questions? Gwendolyn, I  
15 have a question. You talked briefly about  
16 konjac, and voting it off, and allowing time for  
17 comment later during, for the rulemaking.

18 You also commented a lot on just the  
19 amount of work that goes into NOSB  
20 recommendations in general that then get  
21 forwarded onto the program for potential  
22 rulemaking.

1           You guys were one of the commenters  
2           who commented on the three materials of the 2017  
3           Sunset that got re-listed by the program. And I  
4           was just, you know, I was curious to know your  
5           impression of that process. It seemed fairly new  
6           this time. And just, you know, get your thoughts  
7           on that.

8           MS. WYARD: Okay. So, 2017 Sunset  
9           review. We're talking inulin, whey protein  
10          concentrate, and Turkish bay leaves?

11          MR. CHAPMAN: Correct.

12          MS. WYARD: Okay. We commented, so  
13          during the NOSB process we commented in favor of  
14          removing those materials. And that comment was  
15          based on the extensive Sunset survey process that  
16          we go through, and reaching out to as many  
17          members as we possibly can.

18          During the NOSB process I jump up and  
19          down. I do everything I possibly can in my  
20          position, in my power, to alert industry to the  
21          fact that you guys are reviewing these materials,  
22          and that people need to weigh in.

1           There is no way that we are going to  
2           be able to reach everyone. It just won't happen.  
3           There are many, many companies out there that are  
4           not OTA members. Even reaching all of our OTA  
5           members, because everybody has their busy lives.

6           So, we don't reach everyone. We try  
7           our best. The comments that we received at that  
8           time put us in the position to say, go ahead and  
9           remove those materials from the National List.

10           Now, when the proposed rulemaking  
11           process happened, we put out another alert. And  
12           we said, attention, attention, these materials  
13           are going to come off the National List. Are  
14           there alternatives?

15           And so, we did hear from members at  
16           that time, that those three materials were  
17           needed. And so we, I believe that the comments  
18           that we submitted, however, were to say just  
19           that, that we believed that there may be a need  
20           for these materials. And to please look to the  
21           comments received from industry on that matter.

22           So, I guess, you know, a couple of

1 things. And I appreciate you asking this  
2 question. Because yesterday I definitely did not  
3 appreciate hearing the Organic Trade  
4 Association's name brought up in public comment  
5 in what I felt was a disparaging manner, putting  
6 us on the record saying that the Trade  
7 Association's one comment somehow undermined the  
8 National Organic Standards process.

9 The process goes all the way to the  
10 end of rulemaking. People need to weigh in at  
11 both stages. We also petitioned to require  
12 natural flavors to be organic during that 2017  
13 Sunset period. We also petitioned lignin  
14 sulfonate off the National List.

15 As far as I know Organic Trade  
16 Association members are the only ones that have  
17 ever petitioned anything off the National List.  
18 My mission is to see organic ingredients  
19 developed. The National is the entrepreneur's  
20 list of opportunity.

21 I will personally petition whey  
22 protein, Turkish bay leaves, inulin off the

1 National List if we find out there's an organic  
2 alternative. We've got to take it all the way to  
3 the end of the process.

4 And the proposed rulemaking process,  
5 as Jenny Tucker clarified yesterday, I think a  
6 question that came from Dan Seitz, that yes, it's  
7 the full opportunity. And I wish that I would  
8 have reached everybody during the NOSB process.

9 So, on konjac flour we heard from one  
10 person. And I'm going to wrap up right now.  
11 Those surveys are confidential, so I couldn't get  
12 additional information. But I don't feel  
13 confident that konjac flour should come off the  
14 National List. So, I'd like more time to do  
15 outreach. Thank you.

16 MR. CHAPMAN: And we've got Harriet  
17 and Francis.

18 MS. BEHAR: So, for inulin there's  
19 nothing on the Organic Integrity Database. For  
20 Turkish bay leaves, I can't remember if it's  
21 three or five operating just, you know, you can  
22 search the Organic Integrity Database and find

1 it.

2 And for why protein concentrate there  
3 is three types. And two of them are available  
4 from multiple manufacturers, and from even more  
5 brokers that are probably getting it from those  
6 manufacturers. But there's one type that's not.

7 So, we're just a little bit struggling  
8 not so much with OTA, but somewhat with the NOP,  
9 that if something is on their Organic Integrity  
10 Database from multiple sources, why was it being  
11 declared as not commercially available?

12 MS. WYARD: I think the NOP is the  
13 right way to go with that question. Because like  
14 I said, our comments said that there are industry  
15 members out there that have voiced they still  
16 need these materials. And please look to the  
17 comments of others.

18 So, in terms of what informs the  
19 National Organic Programs process in making those  
20 determinations, based on comments, please ask  
21 them.

22 I think on the Turkish bay leaves it

1 was a matter of the type, just as you talked  
2 about, and an annotation fix may be, you know,  
3 would have been the appropriate route.

4 But again, that definitely is a  
5 question that needs to be posed to the program,  
6 in terms of what their process is for determining  
7 whether or not something should be removed or  
8 kept on when they're going through that final  
9 stage of the process.

10 MR. CHAPMAN: Again, I just want to  
11 know, inulin is listed several times in the OID.  
12 There's different types of inulin. And that  
13 specificity might not appear. But it's common  
14 for inulin to run under several names.

15 MS. BEHAR: Yes. I think it's --

16 MR. CHAPMAN: And inulin itself is on  
17 there.

18 MS. BEHAR: -- listed as a chicory, or  
19 yes.

20 MR. CHAPMAN: Yes.

21 MS. WYARD: Yes. This one I think was  
22 the oligofructose enriched, if my memory serves

1 me correctly.

2 MR. CHAPMAN: Yes. But that can also  
3 be legally labeled as just inulin.

4 MS. WYARD: Right.

5 MR. CHAPMAN: Francis.

6 MR. THICKE: Gwendolyn, do you think  
7 it's fair that OTA can go up to the NOP after the  
8 process and do this, and nobody else can? Or do  
9 you think we should all start going to OTA, I  
10 mean, going to the program after the NOSB  
11 process, and lobby them too? Do you think we  
12 should all do or --

13 MS. WYARD: We, everybody does get to  
14 do that process. This was an open, this was a  
15 proposed rule that the National Organic Program  
16 put out, and requested comments.

17 And we weighed in through the Federal  
18 Register, just as the same as everyone else. And  
19 you can go and look at the meeting records --

20 MR. THICKE: Okay.

21 MS. WYARD: And we're completely  
22 transparent about any communications we would

1 have with the program. We didn't lobby the  
2 program. We submitted comments to the Federal  
3 Register, just as you could, or anybody else in  
4 the room could have.

5 MR. THICKE: Okay.

6 MS. WYARD: Thank you. Thank you for  
7 that question.

8 MR. CHAPMAN: Thank you.

9 MS. WYARD: Thanks.

10 MR. CHAPMAN: Up next is Jenny Cruse,  
11 followed by Marisol Oviato. Jenny, if you can  
12 start with your name and affiliation?

13 MS. CRUSE: I'm Jenny Cruse,  
14 coordinator of the Accredited Certifiers'  
15 Association. I'll be addressing the Crops  
16 Subcommittee proposal on strengthening the  
17 organic seed guidance, NOP 5029. I'll also  
18 briefly address the CACS proposal on excluded  
19 operations.

20 The ACA agrees on the importance of  
21 increased organic seed use in organic seed  
22 production systems. And support much of what has

1       been suggested in the proposal. We ask you to  
2       consider four key points as you continue  
3       conversation on this topic.

4               One, while the proposal seeks to steer  
5       all growers toward use of organic seed  
6       exclusively, we are concerned that this will not  
7       be possible for all growers in all years.

8               Two, if GMO contamination is cited as  
9       a specific reason to allow non organic seed use,  
10       a specific contamination threshold would be  
11       helpful. The ACA has attempted to develop  
12       contamination thresholds that could be  
13       consistently applied by certifiers, but at this  
14       point has concluded that this needs to come from  
15       the NOP.

16               Three, a comprehensive organic seed  
17       database established or supported by NOP would  
18       greatly assist in sourcing of organic seed, and  
19       related verification.

20               NOP's Integrity Database seems like a  
21       potential place to start for this, since so much  
22       of the information is already supplied to NOP.

1 But questions related to timing of search and  
2 verification would need to be looked at.

3 Four, the issue of non organic seed  
4 use mandated by buyers must be addressed. So,  
5 thank you for talking about this. We support the  
6 idea of requiring buyers to supply seed search  
7 documentation to growers.

8 But submit that handlers should also  
9 be held accountable in other ways. Handler SOPs  
10 should request a description of seed sourcing  
11 practices as applicable. And these practices and  
12 related documentation should be verified at  
13 inspection.

14 We thank you for considering this  
15 topic, look forward to further information on the  
16 subject.

17 On the subject of the excluded  
18 handlers in the supply chain, an ACA working  
19 group is looking at traceability in the supply  
20 chain.

21 And a major focus is on uncertified  
22 handlers, how we can ensure that the proper

1 documentation is maintained, and that inspectors  
2 are consistently applying the necessary level of  
3 scrutiny during the audit.

4 ACAs are in favor of clarifying  
5 language around this, and would welcome  
6 additional examples of who needs to be certified,  
7 and who can be excluded, as the proposal  
8 recommends.

9 The Organic Trade Association's  
10 comments provide additional examples,  
11 specifically around transloading activities at  
12 ports that the ACA would be interested in hearing  
13 about. Thank you for your work on this topic.

14 MR. CHAPMAN: Thank you. Harriet.

15 MS. BEHAR: On the strengthening the  
16 seed guidance, the regulatory change is to  
17 include improvement in sourcing and use of  
18 organic seed. And there seems to be from public  
19 commenters, and even ACA somewhat, that you need  
20 more clarification on what that improvement looks  
21 like.

22 MS. CRUSE: Well, I guess yes. What

1 does improvement look like? Is it, you know, the  
2 number of seeds that are used, the number of  
3 acres that are in production, you know, the  
4 amount of seed that's used?

5 I think there's probably some question  
6 related to that. But also, kind of to get at a  
7 little bit of what Kiki spoke about before. In  
8 cases where due to issues beyond the growers'  
9 control they're not able to use organic seed, or  
10 they're not able to increase in a specific year,  
11 you know, what is the allowance for that?

12 So, is increasing seed use assessed  
13 annually? Or is it assessed as, you know, a  
14 larger trend? I think those are important  
15 questions to look at.

16 MR. CHAPMAN: Thank you. Up next is  
17 Marisol Oviesto, followed by Andreas Kuenkel.

18 MS. OVIESTO: Hi. My name is Marisol  
19 Oviesto. And I'm with the Northwest Hort Council  
20 out of Yakima, Washington. The Northwest Hort  
21 Council, or NHC, represents growers, packers, and  
22 shippers of apples, pears, and cherries, both

1 conventional and organic, in Idaho, Oregon and  
2 Washington, on regulatory issues of international  
3 and federal policy.

4 While the NHC submitted written  
5 comments on a number of issues before you today I  
6 am focusing my oral comments on the need to allow  
7 the continued use of chlorine materials in the  
8 National Organic Program.

9 Of particular interest to our growers  
10 and packers, this list includes calcium  
11 hypochlorite, chlorine dioxide, and sodium  
12 hypochlorite, materials used in crop and handling  
13 that are before the Board for consideration  
14 today.

15 In many ways the Pacific Northwest is  
16 the epicenter for organic pome fruit and cherry  
17 production in the United States. Washington  
18 State is the national leader in the production of  
19 organic apples, pears, and cherries.

20 Over seven million boxes of organic  
21 apples are now harvested from more than 14,000  
22 acres, amounting to over 90 percent of the entire

1 organic apple crop in the U.S. There is also a  
2 significant amount of organic pears and cherries  
3 planted across the Pacific Northwest.

4 Chlorine based products are a critical  
5 tool for the tree fruit industry in the orchard,  
6 as well as in the packing house setting. They  
7 are vital to reducing the presence of naturally  
8 occurring pathogens that pose health hazards for  
9 consumers. And are essential for compliance with  
10 new requirements for sanitizing tools and  
11 equipment that will soon be implemented on all  
12 commercial tree fruit growers and packers,  
13 through the Food Safety Modernization Act, FSMA.

14 For example, calcium hypochlorite is  
15 used both in the orchard and the packing house as  
16 an algicide, disinfectant, and sanitizer. It is  
17 critical to reducing health human pathogens such  
18 as e coli, and listeria monocytogenes. And it is  
19 used to sterilize equipment, and used to control  
20 fire blight.

21 Sodium hypochlorite and sodium dioxide  
22 are also used in both the orchard and packing

1 house to sanitize irrigation systems, harvest  
2 containers, and pruning equipment.

3 It is also used in packing house water  
4 dump tanks as a disinfectant to reduce potential  
5 for cross contamination. Both are used by nearly  
6 100 percent of our organic tree fruit growers in  
7 our region.

8 It is noteworthy that peracetic acid  
9 is currently the only other widely used sanitizer  
10 permissible under the NOP. And reliance on a  
11 single sanitizer could lead to resistance by  
12 pathogens.

13 On behalf of the growers and packer we  
14 represent the NHC strongly supports the continued  
15 use of these vital tools for equipment and water  
16 sanitation purposes.

17 We ask the Members of the Board to  
18 support the continued listing of chlorine  
19 products. They are of critical importance to the  
20 safe production of organic food, including tree  
21 fruit. Thank you.

22 MS. SWAFFAR: Thank you for your

1 comment. Any questions? Thank you.

2 MS. OVIETO: Thank you.

3 MS. SWAFFAR: Up next is Andreas. And  
4 on deck is Gerald Robertson. Andreas, please  
5 state your name and affiliation for the record.

6 MR. KUENKEL: My name is Andreas  
7 Kuenkel. I'm from BASF. And I will report on  
8 biodegradable mulch film, and our research to  
9 clarify environmental fate.

10 So, biodegradability is our central  
11 promise. And therefore, we invest a lot of  
12 energy to fundamentally understand the process,  
13 how these biodegradable polymers biodegrade in  
14 the lab and in the field.

15 Because the underlying process is  
16 always the culpability of microbes to metabolize  
17 the polymeric material, in this case the  
18 biodegradable mulch film, to CO2 biomass, energy,  
19 and water.

20 So, they are doing the same. But we  
21 will hopefully soon or later do with the  
22 polymers. And the question is, where does the

1 polymer carbon end up? And we have done  
2 intensive studies, together with the ETH of  
3 Zurich to follow up this fate of polymer.

4 So, what happens with the  
5 biodegradable mulch film? At first it's  
6 colonized by microbes. Then these microbes  
7 excrete enzymes, and biodegrade the polymer to  
8 smaller fragments. And these fragments are then  
9 metabolized to CO<sub>2</sub>, and also incorporated into  
10 the biomass.

11 And of course the interaction with the  
12 soil is important with respect to absorption and  
13 desorption. And with the ETH we have developed  
14 different methods to evaluate this. And I will  
15 show only two.

16 The first is the metabolizing to CO<sub>2</sub>.  
17 And you can see that within one year 95 percent  
18 of the biodegradable mulch film is converted to  
19 CO<sub>2</sub>. And the question is, where is the rest?

20 And the majority of the rest is in the  
21 biomass. And for the first time ever this can be  
22 shown with this specific method we developed with

1 ETH. So, we used these 13 labeled carbon, and  
2 then can follow-up where this labeled carbon is.

3 First, on the left side on the top you  
4 see a biodegradable mulch film colonized by  
5 different microorganisms, so with fungi and with  
6 bacteria. And on the right part of the picture  
7 you see the incorporation of the C searching  
8 carbon.

9 And red means that five percent of the  
10 carbon is labeled carbon, which means, as you can  
11 see in the fungi, there are roughly five percent  
12 of labeled carbon. This means this is the rest  
13 of the biodegradable mulch film.

14 The next question is, how viable are  
15 the microbes which are capable of biodegrading  
16 the mulch film? And without going into details  
17 here I can see we have isolate 400  
18 microorganisms.

19 And you have to make it very simple.  
20 You are much more closer related phylogenetically  
21 to the trees outside than a lot of these microbes  
22 within each other.

1                   So, with this work we have shown the  
2 fate of polymer, where the biodegradable mulch  
3 film is going. And this is shown for the first  
4 time, the complete mass balance. Thank you.

5                   MR. CHAPMAN: Asa.

6                   MR. BRADMAN: I just have a question.  
7 Do you have the mass of the material, the film,  
8 on a milligram per meter basis, or a, to put it  
9 in American terms, pounds per acre? I'm just  
10 trying to get a sense of the mass of material.

11                  MR. KUENKEL: Yes. So, we are talking  
12 in the area, assuming that the mulch film is  
13 five, 15 micrometer. So, we are talking here  
14 something about 15 to 20 krem per square meter.  
15 And assuming that the relative soil is 20  
16 centimeter.

17                  So, we are talking here about 0.005 to  
18 0.007 percent. So, that's neglectable. And this  
19 work shows that there is no polymer fragments  
20 accumulated in the soil.

21                  MR. BRADMAN: And so, when you take  
22 that ratio of the soil you -- Assuming it's 20

1 centimeters deep, you're assuming the soil is 20  
2 centimeters deep?

3 MR. KUENKEL: Yes. That's the  
4 relevant --

5 MR. BRADMAN: And you're using 2.6  
6 grams per cubic centimeter for the mass of the  
7 soil?

8 MR. KUENKEL: The biofilm is put on  
9 the soil.

10 MR. BRADMAN: Right. Right.

11 MR. KUENKEL: And this is roughly in a  
12 range of 15 to 20 krems per square meter.

13 MR. BRADMAN: Yes. Got it. Okay.  
14 And the ratio that you gave is to the bulk soil  
15 weight, not the organic fraction?

16 MR. KUENKEL: Yes. This is then what  
17 is in the soil, what is the amount of mulch film  
18 in the soil. And this is biodegraded. And we  
19 see, for example, in Japan over the last 15 years  
20 mulch film is continuously used. And there is no  
21 evidence that the biodegradable mulch films, or  
22 any fragment, is accumulated there in the soil.

1                   MR. BRADMAN: And what is the  
2 percentage of the film that's petroleum based?

3                   MR. KUENKEL: So, today the product in  
4 the market contain a bio base content of ten to  
5 20 percent. So, the majority is petroleum based.

6                   MR. BRADMAN: Okay. Thank you.

7                   MR. CHAPMAN: Briefly. Harriet,  
8 briefly.

9                   MS. BEHAR: So, we did put out a tech,  
10 ask for a technical review. And we got it back.  
11 So, I'm sure you're aware that the National  
12 Organic Program has a guidance document that it  
13 needed to be 100 percent bio based.

14                   And so, for us was the issue of how do  
15 we then counter that. Because we know that your  
16 product is not 100 percent bio based. And so,  
17 there were still quite a few studies out there  
18 that are not complete, because it's a fairly new  
19 product.

20                   A lot of it had to do with soil, you  
21 know, how to fix soil life. Does it act like a  
22 fertility input? Does it cause one type of soil

1 microbe to grow more than another, because of  
2 which ones are eating whatever?

3 So, we, I mean, we're kind of a little  
4 bit in a holding pattern. Because we now have to  
5 work and counter what the NOP has said, in that  
6 they want it to be 100 percent bio based.

7 MR. CHAPMAN: Harriet, briefly.

8 MS. BEHAR: And then just recently bio  
9 based material was presented to us as a mulch  
10 film that is 100 percent bio based. So, we're  
11 still a little bit in a quandary what to do with  
12 this material. Just as information.

13 MR. KUENKEL: Can I give a comment to  
14 the topic of bio based?

15 MR. CHAPMAN: Very briefly.

16 MR. KUENKEL: I'd say we discussed  
17 this topic. And I think, which is absolutely  
18 correct, always in an intellectual context, also  
19 as a vision. And also with a logic that we say,  
20 okay, in nature all polymers are biodegradable  
21 and bio based.

22 And they are continuously recycled,

1       yes. Whereas, the majority of the fossil based  
2       is not, yes. But from a perspective of a  
3       microbe, yes, the microbe is not emotional. The  
4       microbe is only pure scientific driven.

5                   And for the microbe in the soil the  
6       only question is, is it possible to crack the  
7       polymer backbone, and use the carbon for my  
8       metabolism?

9                   And for the microbe it is not decisive  
10      if the carbon is bio based or fossil based. So,  
11      all the microbes, they will discuss bio based  
12      polyethylene, whereas, they like a fossil based  
13      PBAT, yes.

14                  And the second comment is, so I'm now  
15      more or less 20 years in this business of bio  
16      based chemicals, yes. And I have here a picture  
17      of the major bio based monomers which are  
18      available.

19                  And what I want to address here,  
20      besides this remark of the microbes is that to  
21      develop this processes, yes, at least 15 to 13  
22      years have to be put into consideration, yes. So

1 it's not --

2 MR. CHAPMAN: Thank you.

3 MR. KUENKEL: -- possible from one day

4 --

5 MR. CHAPMAN: Thank you. I'm going to  
6 have to --

7 MR. KUENKEL: -- to another to do  
8 that.

9 MR. CHAPMAN: I'm going to have to cut  
10 you off there.

11 MR. KUENKEL: Yes.

12 MR. CHAPMAN: But thank you for your  
13 comments. Thank you.

14 MR. KUENKEL: Okay.

15 MR. CHAPMAN: We're going to have to  
16 move on. Thank you. Gerald, I'm sorry to have  
17 you sit in the hot seat, and then put pause on  
18 it. But given the questions around the welfare  
19 of the Board and the public, we will be breaking  
20 for lunch.

21 Gerald, I'm sorry. You'll be the  
22 first one after lunch, if that works for you.

1 So, we have five commenters left on our list.  
2 And those five, Gerald Robertson, Tom Harding,  
3 David Will, Max Goldberg, and John Ashby will be  
4 all after lunch. And then we'll proceed into the  
5 crops agenda at that time.

6 We are going to break for lunch until  
7 2 o'clock. So, it's only one hour. Please be  
8 back promptly. I'm looking at the Board Members  
9 when I say that.

10 (Whereupon, the above-entitled matter  
11 went off the record at 1:01 p.m. and resumed at  
12 2:03 p.m.)

13 MR. CHAPMAN: Okay, we are going to  
14 get started here, if Board Members could take  
15 their seats.

16 Up first we have Gerald Robertson,  
17 followed by Tom Harding. Gerald, if you could  
18 start with your name and affiliation for the  
19 record.

20 MR. ROBERTSON: You guys are sure this  
21 time, right?

22 MR. CHAPMAN: I am.

1                   MR. ROBERTSON: Okay. Good afternoon.  
2                   My name is Gerry Robertson and I am the Director  
3                   of Supply at Reiter Affiliated Companies based in  
4                   Oxnard, California. We grow organic and  
5                   conventional berries throughout the U.S. and  
6                   Mexico, including an increasing amount of  
7                   container production in all categories.

8                   For the record, Reiter Affiliated  
9                   Companies does not support the proposed  
10                  recommendation for hydroponics and container  
11                  growing. The reasons for this position have  
12                  already been well-articulated by many of the  
13                  farmers in our organization through written  
14                  comments, as well as public testimony at the  
15                  recent webinars. Rather, I wish to talk about  
16                  the future.

17                  I'm at the far end of a long and very  
18                  satisfying career in production agriculture, the  
19                  last 34 years of which have been spent in the  
20                  Reiter organization. I spend little time looking  
21                  back, however, but rather prefer to look  
22                  optimistically ahead to what is coming,

1 especially in the world of food production.

2 In my job, I am privileged to spend  
3 time with many of our young organic farmers, most  
4 of whom are in their 20s and 30s and I am  
5 constantly impressed and inspired by their drive,  
6 their passion, and their commitment to make their  
7 world a better place.

8 In the next 30 to 40 years of their  
9 careers, they will see unimaginable changes in  
10 the way food is produced and many of those young  
11 farmers will be the drivers and implementers of  
12 that change. And change we must.

13 In most systems, there is this one  
14 truth: that which does not adapt and evolve,  
15 eventually dies or disappears. The young farmers  
16 of today will, in their lifetime, see the world  
17 population reach and exceed nine billion people  
18 and will be dealing with the uncertainties of an  
19 ever-changing climate. Providing sufficient  
20 amounts of healthy organic food to that world  
21 will require resources and technologies far  
22 beyond the basic soil-based systems that have

1 mostly sufficed for all of us up until now.

2           Every farmer here, from the small  
3 grower in Maine, with a few acres of vegetables,  
4 to the large industrial farmer in California with  
5 thousands of acres of berries, all face some  
6 common challenges. We deal with the weather. We  
7 fight ever-increasing costs. We must make the  
8 best use of the resources available to us. We  
9 need a ready marketplace for our products and we  
10 are all going into that same future together.

11           The NOSB today is in the position to  
12 help every organic farmer find his or her own  
13 best way to meet these challenges now and in the  
14 future by defining well thought out standards for  
15 production technologies such as containers that  
16 expand organic supply, that provide opportunities  
17 for the next generation of farmers, and that  
18 still adhere to the core principles of organic  
19 farming.

20           So take your time and get it right.

21           The future will thank you.

22           Questions?

1 MR. CHAPMAN: Emily, then Asa.

2 MS. OAKLEY: So one of the few bright  
3 spots in U.S. agriculture is the young people who  
4 are coming to agriculture as a first career. And  
5 the ones that I am most familiar with are those  
6 who are going to rural economies and revitalizing  
7 them, usually in organic production systems and  
8 in the soil. I actually don't know anybody who  
9 has become a young farmer in the systems you are  
10 describing.

11 So just briefly, I started my farm on  
12 leased land on the urban fringe with \$20,000 in  
13 startup capital. I am curious if the same thing  
14 could be done in the productions of some that you  
15 are describing with such a limited amount of  
16 capital.

17 MR. ROBERTSON: Yes, so our company is  
18 made up, primarily, of wholly-owned operations  
19 that have farm managers who are employed by the  
20 company and they manage the farms. They have  
21 come out of Cal Poly or Davis, or different  
22 places like that.

1           But we also have a part of our company  
2           that is partnerships and those partnerships are  
3           generally relationships with people like those  
4           managers or, in some cases, even the farm workers  
5           themselves, who have risen up to a level where  
6           they have become really quite proficient.

7           And when people save their money and  
8           make a stake or put together a stake to get  
9           involved in something, we partner with that. And  
10          that might start with a ten-acre operation and  
11          some of those partnerships have grown to three or  
12          four hundred-acre operations. So that is a very  
13          good opportunity within our company. There is a  
14          path there for people to become their own farmer  
15          or a partner with us.

16                 MR. CHAPMAN: Asa?

17                 MR. BRADMAN: Yes, I have really two  
18                 questions. The first is how nutrients are cycled  
19                 and whether container materials, clippings from  
20                 crops, are they composted, recycled? Do they go  
21                 back into the containers or the soil in some way?

22                         There were some questions earlier

1 about ground cover and their row crops and things  
2 like that or cover crops between the rows.

3 And then my last question would be  
4 related to labeling that I am starting to ask  
5 everyone. Would they be comfortable with a  
6 hydroponic container label or similar -- some  
7 similar form of that?

8 MR. ROBERTSON: Yes. Okay, so as I  
9 think you have heard from other presenters,  
10 virtually all of our crops in containers,  
11 certainly in the organic part are perennial  
12 crops. We are pruning them every year, a couple  
13 times a year, blackberries, raspberries,  
14 whatever. So those prunings are going to  
15 generally go into the soil, which we keep the  
16 middles between our plantings open -- our new  
17 practice is that.

18 And then pots, themselves, when we are  
19 done with that material that is in those pots, we  
20 compost all of that and then recycle it back into  
21 our system. So in several of our areas, we are  
22 starting to develop pretty extensive vermiculture

1 for this purpose so that we can recycle, not only  
2 recycle materials but then use that material,  
3 itself, both directly or to make a tea from it.  
4 It becomes part of our nutrition process.

5 With respect to the mulches, when we  
6 first were doing this type of agriculture, we  
7 were covering everything with those mulches that  
8 you may have seen, the black plastic shade cloth.  
9 But gradually, as our techniques are evolving, we  
10 are realizing that we are better off to just have  
11 the mulch right under the pots and then leave the  
12 middles open for a variety of reasons and part of  
13 that is to be able to reincorporate the material  
14 that we don't want to remove and compost.

15 And then your question about labeling,  
16 I'm not sure on that myself. I would be okay  
17 with the label, a specific label but I would  
18 rather see standards that are clear enough,  
19 whether everybody accepts them or not, but are  
20 clear enough that you either are organic or you  
21 are not. So I fear a little bit of confusion in  
22 that but I would be okay with it, personally.

1                   MR. CHAPMAN: Dave. Then we'll cut it  
2 off there. Dave.

3                   MR. MORTENSEN: Yes, I was wondering  
4 could you give us a sense for what the preceding  
5 land use was before putting into container  
6 production. Were these fields that were  
7 agriculturally managed or some other use?

8                   MR. ROBERTSON: Okay. So there is a  
9 wide variety of answers to that but, in some  
10 cases, the fields were previous organically  
11 certified fields that became unviable because of  
12 contamination of soil pathogens that you can't  
13 deal with in organic. In our conventional  
14 systems, we would fumigate fields like that.

15                   So in some cases, we have fields that  
16 can no longer support it in the soil but we can  
17 support a container on top of that.

18                   In other cases, it is going to be less  
19 favorable soil. So in Ventura County we have a  
20 wide range of soils from the perfect sand that  
21 you would like to have or sandy loam to really  
22 floodplain clay, which is really, really hard for

1 some of our crops, particularly blueberries. So  
2 we will try and find the least suitable -- soils  
3 that are the least suitable for soil farming and  
4 put our container operations there.

5 MR. MORTENSEN: Thanks.

6 MR. CHAPMAN: Thank you.

7 MR. ROBERTSON: Thanks.

8 MR. CHAPMAN: Up next is Tom Harding  
9 followed by David Will.

10 MR. HARDING: Good afternoon. My name  
11 is Tom Harding and I represent Green Ag Supply,  
12 which is the petitioner for Natural Fatty  
13 Alcohols.

14 First of all, I want to say thank you  
15 to the NOSB and to the NOP and for all of your  
16 hard work. I know you have heard that a lot but  
17 you deserve it. I thank you very much for that.

18 As per my earlier request to the NOSB  
19 and to the NOP, and with the cooperation of Tom  
20 and with my good doctor friend over there, Mr.  
21 Thicke, we had made a request that we formally  
22 requested the NOSB move the vote on natural fatty

1       alcohols to the spring 2018 NOSB meeting.

2                   Why? Because when we were notified  
3       about our petition, that it would be up for a  
4       formal vote, that very day we went to get on the  
5       public comment list, which was already full and  
6       had a waiting list. And everybody was very  
7       cooperative. It's just not anyone's fault.  
8       We're not blaming anyone but the circumstances  
9       that happened as a result of that is none of our  
10      growers will be heard from before this is voted  
11      material.

12                   Why we requested this because we want  
13      our producers to be here. We want you to hear  
14      from them firsthand. Many of them are  
15      generational farmers who are not only growing  
16      tobacco, to be very frank, but also other  
17      commercial cash crops that are certified organic,  
18      requiring all of the requirements that organic  
19      has been. Most of these growers have been  
20      certified since the implementation of the rule.

21                   So without having our producers here,  
22      the extension service, particularly from North

1 Carolina State and other places, not hearing from  
2 them, we thought the best thing versus  
3 withdrawal, which we found that under some rule  
4 we didn't know about but we do now, that we would  
5 withdraw the petition and move it forward the  
6 next time but that's not possible because the  
7 rule says that, I understand it is an NOSB rule,  
8 that if the subcommittee has voted on material  
9 that, in fact, it has to go before the whole  
10 Board. And Tom gave me that information and I  
11 really appreciate it.

12 We didn't know about that or we might  
13 have acted differently earlier.

14 But all of that said and done, it is  
15 really important for us that we do have our  
16 producers here, that they are able to talk, that  
17 you are able to hear from farmers with great  
18 experiences and with a lot of the scientific data  
19 that we have to support this particular material,  
20 that you would be able to ask difficult  
21 questions.

22 We have a very good TAP report,

1 overall, from the standpoint of meeting all of  
2 the criteria and, therefore, we felt it was  
3 really important to request it be moved.

4 Our other choices are not very good.  
5 Now, we are prepared to go the whole distance on  
6 this material because it is so important, so  
7 vitally important to our producers.

8 A couple of points that are really  
9 important before I close out and that is, number  
10 one, the subcommittee, who did a really good job  
11 in this thing -- thank you very much.

12 MR. CHAPMAN: Thank you, Tom.

13 Questions? Ashley, Jesse, Steve, and  
14 Harriet. We will stop it there. Ashley.

15 MS. SWAFFAR: Thank you, Tom. So I  
16 understand why you want to take it back because  
17 you didn't have farmers sign up for in-person  
18 public comment. But why did you not have any  
19 farmers submit written public comments or you,  
20 yourself submit written public comments? The one  
21 you submitted was just reiterating the point that  
22 you wanted to bring it back -- you wanted us to

1 bring it back to subcommittee. We do treat  
2 comments equal, as written and/or in-person.

3 So I would like to know why you felt  
4 like you --

5 MR. HARDING: Well, at the time that  
6 this happened, it was a deadline. We knew that  
7 already the public comment list was filled. Most  
8 of our farmers were in the field with harvesting.  
9 They were not going to be prepared to come unless  
10 we really pushed the whole thing hard and most of  
11 them pushed back and said look, man we're really  
12 busy right now.

13 The other thing is from the scientific  
14 standpoint, we have supplied a lot of data  
15 already. We felt very strongly -- and your point  
16 is a really good one actually -- that it was  
17 important that they be before the whole Board and  
18 that you hear from them firsthand with not only  
19 why are they doing what they are doing but why  
20 they need this particular material to do what  
21 they are doing and to successfully meet their  
22 quality requirements.

1           The way this product is sold is sold  
2 on the basis of quality. And this grossly  
3 affects, in a positive way, this material, the  
4 quality of the finished product.

5           MR. CHAPMAN: Thank you, Tom.

6           Jesse.

7           MR. BUIE: Tom, in your petition, you  
8 requested that the fatty alcohol be used as  
9 sucker control on organic crops.

10          MR. HARDING: Correct.

11          MR. BUIE: But the TR only discussed  
12 the use of this product on tobacco. Why was  
13 that?

14          MR. HARDING: Well, we submitted other  
15 crops. We submitted nightshades. We submitted  
16 also this product is used a lot for grafting,  
17 particularly innovative grafting scheme, and we  
18 have it ready to submit for EPA for vegetable  
19 crops, particularly nightshades, but we were told  
20 that because it wasn't already EPA approved that  
21 we couldn't submit those other crop data.

22          The other thing is that we have been

1 contacted since then with personal care, where  
2 there is a number of people interested in natural  
3 fatty alcohols to use in personal care.

4 MR. BUIE: Yes, but the EPA has  
5 approved it only for --

6 MR. HARDING: At this point, only on  
7 tobacco.

8 MR. BUIE: Right, right.

9 MR. CHAPMAN: Steve.

10 MR. ELA: I'm just going to reiterate  
11 what Ashley said. It puzzles me why -- I mean I  
12 get we're all busy but it seems like at a minimum  
13 you should have submitted written comments. You  
14 don't need to answer again but it puzzles me.

15 MR. HARDING: I am going to answer it  
16 again to this point. We felt very strongly, and  
17 because of them being very busy, that personally  
18 being able to be before this Board to talk, and  
19 you hear them -- I'm going to repeat myself -- it  
20 was really important to them, really important to  
21 the growers because win or lose, this is going to  
22 have a huge economic impact downstream on our

1 farmers and you need to hear that from them and  
2 not from me.

3 MR. CHAPMAN: Harriet.

4 MS. BEHAR: So, the Crop Subcommittee  
5 meets a lot. So I am just going to try and make  
6 sure that I have this correct. So I'm going to  
7 look at my fellow subcommittee members.

8 We received the petition. It was for  
9 all crops. When we got our technical review  
10 back, it was for tobacco because we were told  
11 that the EPA has only approved it for tobacco.

12 We then went back to you and said  
13 would you like to switch this to just tobacco  
14 because we can't review something that is not  
15 approved by the EPA for other uses. And you said  
16 no, we want to come back; you want to keep it at  
17 all crops.

18 MR. HARDING: No, I didn't say that.  
19 No, we didn't say that.

20 We were told that the data we had  
21 submitted, which was a file that thick on other  
22 crops, because those other crops were not EPA

1 approved, we couldn't do them. So we just pulled  
2 them back and said it is going to stand for  
3 tobacco.

4 MS. BEHAR: No, the petition. We  
5 asked you about switching what you wanted to be  
6 petitioned for.

7 MR. HARDING: Yes.

8 MS. BEHAR: And you decided you wanted  
9 to keep it at -- we asked you do you want to  
10 switch it to tobacco only or to have it be all  
11 crops. Didn't we ask him that?

12 MR. HARDING: I don't ever remember  
13 that point. I don't remember that point.

14 MS. BEHAR: Jesse?

15 MR. BUIE: Yes.

16 MR. HARDING: Well, who sent it to us?

17 MR. BUIE: Dr. Brines, probably.

18 MS. BEHAR: Well, I'm just trying to -  
19 -

20 MR. HARDING: But anyway, Harriet, the  
21 point is --

22 MS. BEHAR: So we were kind of left --

1 but see we felt like we could not review a  
2 petition for all crops.

3 MR. HARDING: Agreed.

4 MS. BEHAR: Because even if you gave  
5 us material, because we couldn't get a TR for  
6 such a petition because we couldn't get a TR for  
7 something that it's not approved for.

8 So there was quite a bit of back and  
9 forth with you, the petitioner. I'm just trying  
10 to get that straight.

11 MR. HARDING: Let me just say this. I  
12 am not familiar with a back and forth. I do know  
13 that we were told that we could not submit, and  
14 rightfully so, anything that did not have already  
15 an EPA approval. So we withdrew those and  
16 resubmitted the petition, which then stood for  
17 only tobacco.

18 MR. CHAPMAN: I'm going to call on  
19 Emily in a second.

20 First, Dr. Brines, there was a  
21 question about whether we had a communication  
22 with the petitioner. To your recollection, can

1 you speak?

2 DR. BRINES: Yes, thank you. I don't  
3 have any record of official requests from the  
4 Crops Subcommittee to the Petitioner asking  
5 specifically to limit the scope of the petition.

6 I will say that when we did review the  
7 petition, we only accept petitions for uses that  
8 would be allowed for pesticidal uses for EPA.

9 So you know they can ask for whatever  
10 listing that they want. The Board can't approve  
11 uses that would not comply with the EPA label.  
12 But certainly, if they were to list fatty  
13 alcohols, for example, without an annotation,  
14 that would only be allowed for uses that are EPA  
15 permitted. You couldn't use that on other crops  
16 because there are no EPA-labeled uses at this  
17 time.

18 MR. HARDING: And that was clear to  
19 us.

20 MR. CHAPMAN: So Emily, and then we  
21 will cut it off there.

22 MS. OAKLEY: Just a point of

1 clarification that I think the subcommittee did  
2 get information from the NOP that we could only  
3 look at tobacco because it was the only approved  
4 use and I just want to make it clear that during  
5 our deliberations and discussions during  
6 subcommittee calls, it was just for tobacco use.  
7 And I don't think it affects the outcome of our  
8 decision at that time.

9 MR. HARDING: Well, I do hope you will  
10 grant us our request. Thank you very much.

11 MR. CHAPMAN: Thank you, Tom.

12 Up next is David Will, followed by Max  
13 Goldberg.

14 MR. WILL: Good afternoon. My name is  
15 David Will and I am the General Manager of Chino  
16 Valley Ranchers, a Southern California egg  
17 producer. I am Secretary of the Organic Egg  
18 Farmers of America and I am the Chairman of the  
19 Methionine Task Force, which is what my comments  
20 are on today.

21 It has been a year since we have  
22 brought methionine to discuss with you. And one

1 of our commitments several years to the Board was  
2 that any updates or significant strides or  
3 information we felt was relevant we would pass to  
4 you guys. So this is our 2017 presentation.

5 The Methionine Task Force is a  
6 collection of some of the larger organic egg  
7 producers in the country. We are also a  
8 collection of more than 300 independent family-  
9 owned and operated individual certificate holders  
10 and some of the smaller organic pasture-claimed  
11 producers within the country and also some of the  
12 broilers.

13 We represent about 70 percent of the  
14 broiler industry and a large number, more than  
15 400 plus certificate holders in the organic egg  
16 segment.

17 In 2017 we actually formalized our  
18 group so that we could self-tax and form some  
19 research and that's what I wanted to talk to you  
20 about briefly.

21 We are currently funding a three-year  
22 study at the University of California at Davis on

1 the production and feeding of black soldier fly  
2 larvae in organic laying hens. The study is  
3 working on the production of the larvae, which is  
4 the best medium to raise the larvae. We found  
5 that changing what the medium is that they are  
6 growing in actually changes their methionine  
7 content, what's the best moisture and the best  
8 temperature in order to grow the larvae, and then  
9 the beauty of this is the byproduct of growing  
10 the larvae. We actually are getting a very nice  
11 fertilizer of it as well.

12 All of the birds are in four groups.  
13 They are on an outdoor-based system. There are  
14 two control groups that were given synthetic  
15 methionine at two days of age and then two groups  
16 that are fed a black soldier fly larvae at a 20  
17 percent inclusion rate and have had zero  
18 synthetic methionine since their growth.

19 The next slide, which I hope -- I'm  
20 going to hit the wrong button -- this is actually  
21 one of four pens that the birds are in. You can  
22 see they have rotation available to them. It is

1 completely based outdoors on a grass basis.

2 And the next slide is the organic feed  
3 that they are getting with a 20 percent of black  
4 soldier fly larvae.

5 We just wanted to give you some  
6 updates on this. Our first major hurdle is that  
7 we are not AFFCO approved in the United States  
8 for feeding black soldier flies to laying hens or  
9 broilers, however, it is approved in Canada. We  
10 don't have FDA approval yet and we are feeding at  
11 a 20 percent inclusion rate. We are hoping to  
12 test it at 15 and 10 percent to see if that works  
13 as well. Our other question is are organic  
14 insects ever going to exist.

15 And then our last one is the supply  
16 issue. Just a quick number. The USDA says there  
17 is 14 million laying hens in the United States,  
18 100 hens eat 25 pounds of feed per day. That is  
19 say 3.5 million pounds of organic feed per day at  
20 a 20 percent inclusion rate, that is 700,000  
21 pounds of black soldier fly larvae we would have  
22 to produce a day but they are 75 percent

1 moisture. That would mean we would need 2.8  
2 million pounds per day of black soldier fly  
3 larvae just for laying hens compared to 3500  
4 pounds of methionine.

5 MR. CHAPMAN: Ashley?

6 MS. BRIONES: So David I just want to  
7 say thank you for the Task Force bringing us an  
8 update each year. I think the Board got the --  
9 you know the industry received our message of we  
10 are wanting an alternative to synthetic  
11 methionine and we appreciate your work on looking  
12 into that.

13 MR. WILL: We're happy to do it.

14 MR. CHAPMAN: Harriet?

15 MS. BEHAR: So a while back I know I  
16 looked, there is an ATTRA publication that has  
17 various feedstocks that are high in methionine.  
18 And I think nonfat dry milk is quite high in  
19 methionine and that is quite readily available as  
20 an organic. Is there a problem with it as far as  
21 going bad or caking up or --

22 MR. WILL: It's part the balancing of

1 lysine and methionine.

2 MS. BEHAR: Okay.

3 MR. WILL: You just can't look at one.  
4 You have got to look at the entire spectrum.

5 MS. BEHAR: And so there is not enough  
6 lysine in the nonfat dry milk?

7 MR. WILL: We're going to look into  
8 that. That is down the list. Our first one was  
9 Brazil nuts was our favorite go-to but there is a  
10 major selenium problem that we would literally --  
11 it would work great but it would kill the  
12 chickens. So we had to kind of decide that  
13 wasn't going to work.

14 MS. BEHAR: I think that probably  
15 doesn't work that great.

16 MR. WILL: A major hurdle.

17 But we are going down the list and we  
18 have several things. This was insects was one  
19 that became available and quite interesting to  
20 us, two-fold, because of the byproduct we get out  
21 of the fertilizer and the fact that they are very  
22 easy to breed.

1 MS. BEHAR: And then in your list of  
2 things to do, is there possibly two or three  
3 items that you would try to pull together?  
4 Because it does seem that it may be the best  
5 source but sourcing it might be quite difficult.

6 MR. WILL: Well, actually there is a  
7 company down in Irwindale that we are going out  
8 to meet with that is actually doing a large-scale  
9 project. They have two locations in the U.S. and  
10 they are actually doing large-scale black soldier  
11 fly. The beauty of this fly is it's not a pest  
12 that would bother humans. Once it hatches, it  
13 doesn't eat. When it turns from the larvae to  
14 the fly state, all it does is have sex and die,  
15 kind of like a fruit fly. That's a good thing to  
16 do, apparently, but they don't land on food.  
17 They don't eat, they don't contaminate. So we  
18 are hoping we have some luck with FDA with that  
19 one. And we are not growing them on manure,  
20 which was our other major concern of bringing  
21 pathogens in.

22 MR. CHAPMAN: If there was some free

1 beer in that, that sounds like a pretty good life  
2 cycle.

3 Sue, and then I have a question.

4 We'll end it there. Sue.

5 MS. BAIRD: I know there has been some  
6 work on genetics of high-lysine corn.

7 MR. WILL: Yes, we funded that study.

8 MS. BAIRD: From Arkansas, yes. How  
9 is that working out?

10 MR. WILL: Well, the wild pigs liked  
11 it more than anything else. So, they destroyed  
12 our seed crop. The problem with it was it had a  
13 significantly lower yield and a higher cost to  
14 produce. So it was very hard to convince a  
15 farmer to work just as hard to grow 30 percent  
16 less, where he couldn't get 40 percent more for  
17 it.

18 So I know that is still kind of being  
19 kicked around out of the Midwest, up in that  
20 group there. We have talked to them a couple  
21 times but we just didn't see the gain on it. And  
22 again, it was the balancing of the lysine and the

1 methionine, and the cystine. It just wasn't the  
2 perfect product for us.

3 And actually, insects look like they  
4 may be a little more in line with our balancing.

5 That's something we can look at too,  
6 but they weren't at the top of the list for  
7 insect. Actually, number one is dung beetles but  
8 the word dung we figured we'd never get by FDA.

9 Yes, good material. You have got to  
10 use it.

11 MR. CHAPMAN: One last question.  
12 Where are you in the FDA approval process?

13 MR. WILL: We've talked to them  
14 softly. We know that in California we've talked  
15 all the people that matter there. We are quite  
16 confident that we could get an emergency order to  
17 allow us to use it in California as a limited  
18 test on a more commercial-sized flock. Our first  
19 problem is sourcing. Even if you take that and  
20 do 20,000 birds, it is several hundred pounds a  
21 day or a week of black soldier fly larvae that  
22 have to be freeze dried introduced.

1                   And I will tell you I actually did  
2 taste the eggs. Even with the 20 percent  
3 inclusion rate, we actually did not have a flavor  
4 profile problem. And all the eggs are being used  
5 on UC Davis' campus. So hey, it's good for  
6 Berkeley.

7                   MR. CHAPMAN: So what comes first, the  
8 FDA approval or the scale up?

9                   MR. WILL: It's both. Honestly, it  
10 has to be two-pronged. We have to be able to  
11 prove that we can make it and what they are going  
12 to grow on to take it to FDA. Their biggest  
13 concern is the medium it grows on and what  
14 potential contamination can come out of that.  
15 The last thing you want to have is the news that  
16 we just released 140 million black soldier fly  
17 into the environment because they hatched over  
18 the weekend.

19                   So, we have to go through that whole  
20 thing. And then AFFCO has obviously got to be  
21 first. The fact that it's now available in  
22 Canada is beneficial to us but, again, that is

1 only in broilers.

2 MR. CHAPMAN: Thank you.

3 MR. WILL: Vote OLPP, please. We need  
4 that. Please.

5 MR. CHAPMAN: Thank you.

6 Up next is Max Goldberg and on deck is  
7 John Ashby.

8 Max, you can start with your name and  
9 affiliation.

10 MR. GOLDBERG: Good afternoon. Max  
11 Goldberg from Organic Insider and Living Maxwell.

12 Two things I would like to discuss  
13 today. First, in regards to the hydroponics  
14 container growing system, I believe the most  
15 important question that you all need to ask  
16 yourself is whether certifiers can in fact  
17 inspect these systems, not what a container  
18 growing system is.

19 According to Bart Hall-Beyer, a soil  
20 chemist, a professional agronomist who has, over  
21 the years, inspected nearly a million acres in  
22 seven countries for organic certification, he

1 says that hydroponics is utterly impossible to  
2 inspect for organic certification. It would be  
3 completely incompatible with organic  
4 certification, absent a full-time on-site  
5 observer at each and every site.

6 If inspecting these operations is  
7 impossible, then the Board ought to put all these  
8 systems together, hydroponics, aeroponics,  
9 aquaponics, container-growing systems into one  
10 and decide if they all are in violation of OFPA.

11 That is the question that I am asking  
12 the NOSB to consider, whether organic certifiers  
13 can in fact certify these systems.

14 Second, Next 7's petition against  
15 hydroponics is over 100,000. These are some that  
16 people have literally hand-signed. These are not  
17 clicked with their mouse signing an e-petition.  
18 They have signed these personally and the  
19 majority of the 100,000 are in the last 48 hours.

20 The second thing I want to bring up is  
21 we are spending so much time on fraudulent  
22 organic grains from abroad, which is a massive

1 problem and starting to be addressed, but I think  
2 that the Board needs to pay attention what  
3 happened to Aurora, which has been completely  
4 swept under the rug. And I ask all the members  
5 to demand an answer from the USDA about what  
6 happened to Aurora.

7 We just heard that the case was  
8 closed; Washington posted an investigation; the  
9 milk was comparable to conventional milk. With  
10 aerial photos, satellite photos, there were  
11 clearly red flags here and all we hear is that  
12 the investigation was closed. We have not gotten  
13 an explanation about anything.

14 And I think it is up to all the NOSB  
15 members to demand an investigation. And the  
16 answer we got yesterday from the NOP here was,  
17 frankly, inadequate, insulting, and very damaging  
18 to the integrity of the organic brand.

19 Consumers rely on transparency and  
20 we're not getting any transparency on organic.  
21 And there are a lot of CEOs who are watching  
22 what's taking place at this meeting and they are

1 going to hear that unless things get clarified  
2 about what happened with organic, the lack of  
3 transparency is very, very high. And if NOSB  
4 members truly care about organic and maintaining  
5 the integrity of organic, I urge you to give us  
6 transparency about what happened with Aurora  
7 because we are worrying about fraud from abroad.  
8 We need to understand what is taking place in our  
9 own country.

10 MR. CHAPMAN: Thank you, Max.

11 Questions for Max?

12 Thank you very much.

13 Up next is John Ashby. You will  
14 notice, again, no one is on deck. So, John, you  
15 will be closing out public comment today.

16 John, if you can start with your name  
17 and affiliation.

18 MR. ASHBY: I'm John Ashby speaking on  
19 behalf of the No on Discussion Documents and Yes  
20 on Containers, All of Them Committee, which so  
21 far is me.

22 The only way James Madison was able to

1 get enough signatures for the Constitution was to  
2 promise to produce the accompanying Bill of  
3 Rights immediately after signing the  
4 Constitution.

5 To wit: our belated OFPA Bill of  
6 Rights. First Amendment: NOSB shall make no law  
7 respecting a disestablishment of organic, or  
8 prohibiting the legal regulated exercise thereof,  
9 or abridging the freedom of organic speech, or of  
10 the press, or the right of the organic community  
11 peaceably to assemble and drink free wine from  
12 Phil -- ditto to CCOF's comments, by the way --  
13 and to petition the NOSB for a redress of  
14 grievances.

15 Second Amendment: A well-regulated  
16 enforcement being necessary to the security of  
17 true organics, the right of the people to keep  
18 and bear legal weapons against infractions shall  
19 not be infringed.

20 We only have two minutes, as you are  
21 abridging my free speech by only allowing me  
22 three minutes.

1                   Regarding no disestablishment of  
2                   organics, these containers are legally organic.  
3                   This is why it will require rulemaking at least  
4                   to prohibit them. I'm not so sure it might not  
5                   require an OFPA change.

6                   The discussion documents strike me as  
7                   so contradictory it seems like we are debating  
8                   how much sand is in the water. It's the  
9                   dissolved stuff that feeds the plants.

10                  And the carve-outs make no sense to me  
11                  at all. If you want to eliminate any of the  
12                  containers, then out go ornamentals, mushrooms,  
13                  herbs, the future, trees, and more by the same  
14                  logic. I don't see any option to all or nothing.

15                  The argument that if you take the  
16                  nutrients out of the water and hydroponic plants  
17                  die is you take the nutrients out of the water in  
18                  in-soil plants and they die. In fact, hydroponic  
19                  tomatoes could be argued as the most soil-  
20                  friendly organic of any. The only outputs are  
21                  organic tomatoes after massively efficient  
22                  utilization of resources and organic compost,

1 which can go on other soil, most often from a  
2 warehouse that otherwise would not grow food.

3 Ditto, again, to CCOF arguments and  
4 realize that we do not have free speech. Many  
5 are intimidated and not speaking out against the  
6 loudest.

7 We need all these containers to remain  
8 within the organic fold, period.

9 P.S. Enforcement is a huge problem  
10 that has not been sufficiently addressed. I know  
11 we are starting on it. We are not even close.  
12 When a Washington Post reporter can figure out  
13 all that imported grain was not organic but the  
14 certifier providing the document, who  
15 theoretically has access to all their paperwork,  
16 could not, this is a problem. If you can't do  
17 the audit trail, you should not be certifying it.

18 P.S. Natural is a substitute --  
19 natural is just a complete and utter disaster.  
20 No one in their right mind would put natural on a  
21 product. We'll get sued. And that's funny but  
22 it's true.

1 MR. CHAPMAN: That's it?

2 MR. ASHBY: That was my barking dogs.

3 MR. CHAPMAN: You made it before the  
4 buzzer.

5 Any questions? Ashley?

6 MS. SWAFFAR: Why didn't we get a good  
7 poem or a haiku? I mean I just feel like I'm --  
8 the Bill of Rights, I understand.

9 MR. ASHBY: I'm in a grouchy mood  
10 about this. This is the future you know. And  
11 it's not going to reduce one piece of food coming  
12 out of these containers. It's not going to  
13 reduce one.

14 But the idea that -- I mean what  
15 killed me in reading this that I didn't even  
16 mention is that because the percentage is small  
17 well, then it's okay to disallow this. That's  
18 ridiculous. It either is or isn't. And the  
19 carve-outs make no sense whatsoever.

20 And right now it is. And I think what  
21 we need to do is keep it within the fold and  
22 develop the standards so that it is not

1 everyone's going to like it and don't be telling  
2 people who are not against containers that they  
3 are against soil. I am not against soil. I'm  
4 working one of the biggest transition programs  
5 right now in our company. It's a real pain the  
6 neck, very difficult to do. But because somebody  
7 is for containers does not mean they are against  
8 soil.

9 MR. CHAPMAN: Thank you, John.

10 MR. ASHBY: Thank you.

11 MR. CHAPMAN: I will revise my last  
12 comments to John and say that's it. We are done  
13 with public comments. And we will now be moving  
14 on to the subcommittee portion of the agenda.

15 First up today is the Crops  
16 Subcommittee and I will be handing it over to  
17 Francis Thicke, the chair.

18 DR. THICKE: Thank you, Tom.

19 To begin with, we have a number of  
20 2019 sunsets to review and we will start out that  
21 we will, as Michelle reminded me, first we will  
22 have Lisa Brines give us -- the first one up is

1 chlorine materials, calcium hypochlorite,  
2 chlorine dioxide, and sodium hypochlorite. And  
3 Lisa is going to give us the details.

4 DR. BRINES: Yes, thank you, Francis.

5 I will read the first three chlorine  
6 materials into the record. The Board wanted to  
7 take those as a group.

8 So we start the Sunset 2019 Review  
9 with Section 205.601 of the National List as  
10 synthetic substances allowed for use in organic  
11 crop production. And the first three materials  
12 are under paragraph (a) as algaecide,  
13 disinfectants, and sanitizer, including  
14 irrigation system cleaning. Chlorine materials  
15 for pre-harvest use, residual chlorine levels in  
16 the water in direct contact or as water from  
17 cleaning irrigation systems applied to soil must  
18 not exceed the maximum residual disinfectant  
19 limit under the Safe Drinking Water Act, except  
20 that chlorine products may be used in edible  
21 sprout production according to EPA label  
22 directions.

1                   And the three materials are (i)  
2 calcium hypochlorite, (ii) chlorine dioxide; and  
3 (iii) sodium hypochlorite.

4                   And the most recent technical report  
5 for these materials was completed in 2011.

6                   Thanks.

7                   DR. THICKE: Thank you, Lisa. This  
8 material, I am the lead on, all three of them  
9 actually. So what we are going to do is we are  
10 going to summarize all three and then we are  
11 going to vote individually on them.

12                   These chlorine sanitizers are all  
13 considered to be very effective sanitizers that  
14 are used in crops, in livestock, and in handling  
15 but we are only dealing with them in crops right  
16 now. However, they can also be harmful to human  
17 health and environment. They are caustic and can  
18 be a concern for occupational exposure. They can  
19 cause eye and skin injury. Ingestion can cause  
20 gastrointestinal irritation and corrosive  
21 injuries to mouth, throat, esophagus, and  
22 stomach.

1           The comments, a lot of commenters said  
2 they need them, they use them for a variety of  
3 things, for cleaning tools, for equipment, and  
4 workstation cleaning, maintenance of irrigation  
5 equipment, and so on. So the comments were  
6 overwhelmingly in favor of keeping them on the  
7 list.

8           However, we also have comments that  
9 have come in saying that we need to review these  
10 sanitizers. As we have talked about before,  
11 sanitizers in general, and disinfectants, and  
12 cleansers, should be a comprehensive review  
13 relative to safety, and legal requirements, and  
14 so on.

15           And as Harriet mentioned earlier, I  
16 think yesterday, we put in a request to the NOP  
17 to get that on our work agenda.

18           So, are there any questions on the  
19 chlorine products?

20           I guess not. The, Tom, we can go to  
21 vote.

22           MR. CHAPMAN: Okay. So as a reminder

1 to the Board, this is a sunset material. Sunset  
2 materials come as motions to remove. So a yes  
3 vote is a vote to remove. A no vote is a vote to  
4 retain on the list or to not recommend removal.

5 So this motion comes from Francis,  
6 seconded by Emily from the subcommittee. And we  
7 will start the voting with the -- this is for all  
8 three at once and I will read the motion in a  
9 fraction of a second.

10 The motion is a motion to remove  
11 calcium hypochlorite -- I should read all three.  
12 Is that correct? Motion to remove chlorine  
13 materials calcium hypochlorite, chlorine dioxide,  
14 and sodium hypochlorite.

15 Again, it came from Francis and it was  
16 seconded by Emily. And we will start the -- a  
17 yes vote is to remove; a no vote is to retain.  
18 And will start the voting with A-Dae.

19 DR. THICKE: Point of order, Tom.  
20 They are three separate.

21 MR. CHAPMAN: They are three separate  
22 motions?

1 DR. THICKE: Yes. Do we want to vote  
2 separately? They actually have the same motion  
3 made by the same person and the same second.

4 MR. CHAPMAN: Yes, we should handle  
5 them three different times, if it came as three  
6 separate motions, unfortunately.

7 So we will start with the first one,  
8 which is the motion to remove calcium  
9 hypochlorite. It came from -- moved by Francis,  
10 seconded by Emily. And the voting will start  
11 with A-Dae.

12 MS. BRIONES: No.

13 MS. DE LIMA: No.

14 MR. BRADMAN: No.

15 MS. MOSSO: No.

16 MR. ELA: No.

17 MR. MORTENSEN: No.

18 MR. BUIE: No.

19 MS. SWAFFAR: No.

20 DR. SEITZ: No.

21 MR. RICE: No.

22 MS. BAIRD: No.

1 MS. BEHAR: No.

2 MS. OAKLEY: No.

3 DR. THICKE: No.

4 MR. CHAPMAN: No.

5 Zero yes, 15 no and the motion fails.

6 The second motion is a motion to  
7 remove chlorine dioxide. It came from Francis,  
8 seconded by Emily.

9 The voting will start with Lisa. A  
10 yes vote is to remove; a no vote is to retain.

11 MS. DE LIMA: No.

12 MR. BRADMAN: No.

13 MS. MOSSO: No.

14 MR. ELA: No.

15 MR. MORTENSEN: No.

16 MR. BUIE: No.

17 MS. SWAFFAR: No.

18 DR. SEITZ: No.

19 MR. RICE: No.

20 MS. BAIRD: No.

21 MS. BEHAR: No.

22 MS. OAKLEY: No.

1 DR. THICKE: No.

2 MS. BRIONES: No.

3 MR. CHAPMAN: The chair votes no.

4 Zero yes, 15 no. The motion fails.

5 Motion to remove sodium hypochlorite

6 made by Francis, seconded by Emily.

7 Voting will start with Asa. A yes

8 vote is to remove; a no vote is to retain.

9 MR. BRADMAN: No.

10 MS. MOSSO: No.

11 MR. ELA: No.

12 MR. MORTENSEN: No.

13 MR. BUIE: No.

14 MS. SWAFFAR: No.

15 DR. SEITZ: No.

16 MR. RICE: No.

17 MS. BAIRD: No.

18 MS. BEHAR: No.

19 MS. OAKLEY: No.

20 DR. THICKE: No.

21 MS. BRIONES: No.

22 MS. DE LIMA: No.

1 MR. CHAPMAN: No.

2 Zero yes, 15 no. The motion fails.

3 DR. THICKE: So the next item up is  
4 herbicides, soap-based and Sue was the lead on  
5 that one.

6 DR. BRINES: And I will go ahead and  
7 introduce it first.

8 So we're moving on to paragraph (b),  
9 same Section 205.601. As herbicides, weed  
10 barriers, as applicable. And the listing is (1)  
11 Herbicides, soap-based -- for use in the  
12 farmstead maintenance (roadways, ditches, right  
13 of ways, building perimeters) and ornamental  
14 crops.

15 And the most recent technical report  
16 was completed in 2015. Thank you.

17 MS. BAIRD: Thank you. Soap-based  
18 herbicides are generally comprised of fatty acid  
19 components. They are produced, the fatty acids  
20 are produced through a practice process known as  
21 saponification. This came up. We had 46  
22 comments on the removal of herbicidal soaps; 34

1 of those were in favor of remaining on the list.  
2 There were 12 that were concerned because of  
3 perhaps environmental issues.

4 Technical review did show that there  
5 could be some damage issues to some aquatic  
6 animals but a recent EPA statement showed that  
7 they didn't see that would happen because there  
8 was very low impact of runoffs into the water  
9 systems.

10 So, we made a motion -- I made a  
11 motion not to list, correct?

12 DR. THICKE: Well, is there any  
13 discussion? Emily.

14 MS. OAKLEY: I have reservations about  
15 this material for the reasons stated in the TR in  
16 that it can also be potentially toxic to soil-  
17 dwelling organisms. I also know that you are  
18 supposed to apply not near waterways but I think  
19 that there is a potential for that to sometimes  
20 happen. So, I am conflicted on this product.

21 DR. THICKE: I actually am also  
22 concerned. Reading the comments, everybody who

1       said they wanted them that I saw said that they  
2       are used to them but I never got a real reason.  
3       I mean it didn't even seem like they are using  
4       them.

5                       I don't know why you can't just mow  
6       grass, why you have to use a herbicide. I've  
7       never seen anybody use it around -- I mean it's  
8       around roadways, around buildings and such and  
9       that is kind of where people mow. Anybody have  
10      any -- am I wrong about that?

11                      I mean is there a need to put a  
12      herbicide on the farmstead?

13                      Yes, Harriet.

14                      MS. BEHAR: Well, I don't know that  
15      I've seen people use this one. I've seen them  
16      use the citric acid-based herbicide around bins,  
17      where it is fairly difficult to get up close and  
18      maybe they have gravel there and the grass is  
19      growing up and they are trying to keep rodent  
20      habitat down. So they like to keep it clean  
21      right around the base of the bin.

22                      DR. THICKE: Scott?

1           MR. RICE: Yes, we've heard from the  
2 growers that we certify. They use this. It is a  
3 tool in their toolbox and I would advocate  
4 continued support with recognition that there is  
5 continued oversight at inspection and by  
6 certifiers to ensure that this is being used or  
7 include inspections that this is being used  
8 appropriately and to label use.

9           DR. THICKE: Any other comments?  
10 Ashley.

11           MS. SWAFFAR: Yes, so this is not on  
12 my materials input list but I have actually  
13 inquired about putting one product like this on  
14 my materials input list for like my seed starting  
15 greenhouse is gravel on the bottom and it's like  
16 Bermuda grass central. So that is kind of the  
17 scenario I would want to use it in, is spraying  
18 it on the gravel underneath stuff.

19           DR. THICKE: You wouldn't want mow on  
20 the gravel you said?

21           MS. SWAFFAR: It's gravel. So I have  
22 like plastic down and then gravel on top. So you

1 can't mow --

2 DR. THICKE: Oh, okay.

3 MS. SWAFFAR: -- inside my little  
4 greenhouse.

5 So that is the scenario I would use  
6 something like this on.

7 DR. THICKE: Inside. You said inside  
8 the greenhouse?

9 MS. SWAFFAR: Yes.

10 DR. THICKE: Okay. Steve.

11 MR. ELA: We don't use it personally  
12 but I can certainly see it's not -- like in the  
13 West, it's not always that easy to mow,  
14 especially if you have rocky ground.

15 And with FSMA now and gaps, I mean if  
16 you have a packing facility, you are required to  
17 have, for rodent control around the edges of  
18 those buildings, you know keep the weeds down and  
19 such. So I can see where it could be expedient.

20 I mean you can go out and weed whack  
21 and spend a lot of time but it takes a lot of  
22 time and it's hard to stay on top of. So I can

1 see a use for it.

2 DR. THICKE: Okay, Sue.

3 MS. BAIRD: Yes, and I do do a lot of  
4 inspections in the West and they do have problems  
5 a lot of times around the roadways. They are  
6 pretty steep. It would be really pretty  
7 difficult for them to mow without having tractor  
8 incidences. They really feel like it's important  
9 to have.

10 DR. THICKE: Dan?

11 DR. SEITZ: Question for Scott. Are  
12 there equivalent substances for control, weed  
13 control?

14 MR. RICE: There is always cultural  
15 practices but, as fellow Board members have just  
16 expressed, it's a lot of manual removal.

17 DR. SEITZ: But no other equivalent  
18 substances.

19 DR. THICKE: Harriet.

20 MS. BEHAR: Yes, there is a citric  
21 acetic -- citric acid and acetic acid. And there  
22 is environmental issues there, too. And that's

1 the one I see more often in the Midwest.

2 DR. THICKE: Tom, did you have your  
3 hand up? Oh, okay. Anybody else?

4 Okay, I guess we're ready to vote,  
5 then, Tom.

6 MR. CHAPMAN: Okay, so the motion is  
7 to remove soap-based herbicides from 205.601(b).  
8 The motion comes from Sue Baird and was seconded  
9 by Jesse Buie.

10 Voting will start with Joelle. A yes  
11 vote is to remove; a no vote is to retain.

12 MS. MOSSO: No.

13 MR. ELA: No.

14 MR. MORTENSEN: No.

15 MR. BUIE: No.

16 MS. SWAFFAR: No.

17 DR. SEITZ: No.

18 MR. RICE: No.

19 MS. BAIRD: No.

20 MS. BEHAR: No.

21 MS. OAKLEY: Abstain.

22 DR. THICKE: No.

1 MS. BRIONES: No.

2 MS. DE LIMA: No.

3 MR. BRADMAN: No.

4 MR. CHAPMAN: The chair votes no.

5 Zero yes, 14 no, one abstention. The  
6 motion fails.

7 DR. THICKE: The next item up is  
8 biodegradable, biobased mulch film. Harriet --  
9 and Lisa first.

10 DR. BRINES: All right. Thank you.  
11 We're continuing on under paragraph (b) of  
12 205.601 as herbicides, weed barriers, as  
13 applicable: (ii) mulches; (iii) biodegradable  
14 biobased mulch film, as defined in Section 205.2  
15 must be produced without organisms or feedstock  
16 derived from excluded methods.

17 This is the substance's first sunset  
18 review and technical reports were completed in  
19 2012, 2015, and 2016. Thanks.

20 DR. THICKE: Harriet.

21 MS. BEHAR: Okay, so numerous  
22 certifiers, and growers, and many others have

1 supported the relisting as it is, which is the  
2 way the subcommittee voted, in a hope that we  
3 will continue to monitor ongoing research. Our  
4 most recent technical review asked some questions  
5 that could not be answered because the research  
6 was not yet complete, which included questions  
7 about long-term use and effect on soil life. And  
8 since it's a fairly new product, we just didn't  
9 have that long-term research, so if someone was  
10 using that mulch and it was biodegrading in the  
11 same place year after year.

12 There were some public interest groups  
13 that felt that since there is no product that  
14 currently meets the standard, we should just  
15 remove it.

16 One company presented on this product  
17 during the public comment webinar that they have  
18 a 100 percent biobased mulch but that going  
19 through the testing in order to meet the  
20 annotation was cost prohibitive, in order to  
21 demonstrate the biodegradability and doing  
22 proposed on-farm field testing could possibly be

1 an alternative to that testing where they have to  
2 pay for that approval that is in the annotation.

3 The Crops Subcommittee intends to  
4 continue monitoring the possibility of this 100  
5 percent biobased product. We just found out  
6 about it. So because we know that finding a  
7 product that would be acceptable either under the  
8 current annotation or by changing the annotation  
9 could be useful to many organic specialty crop  
10 producers.

11 Of course right now when they use a  
12 plastic mulch, they have to put down and pick it  
13 up. And there are environmental concerns, too,  
14 of taking it to the landfill and that sort of  
15 thing.

16 So the Crops Subcommittee recommended  
17 to renew this material with no change to the  
18 annotation and will keep monitoring as things  
19 continue to -- we learn more from research and  
20 possibly other products.

21 And the vote was no to remove and one  
22 absent -- eight no to remove.

1 DR. THICKE: Eight no. Okay.

2 Questions? Emily.

3 MS. OAKLEY: I remember we discussed  
4 in the subcommittee whether or not we should  
5 remove this listing and you said that we should  
6 keep it because it also includes Kraft paper. Is  
7 that still accurate?

8 MS. BEHAR: Yes, so there is a product  
9 that is approved by OMRI that is a paper product.  
10 So there is actually a 100 percent biobased  
11 mulch. It's not really a film. It's paper.

12 DR. THICKE: Other comments,  
13 questions?

14 MR. BRADMAN: Just I think we also  
15 talked about possibly revisiting it at the spring  
16 meeting. I wasn't sure. Did we put a time frame  
17 on when we would revisit this issue, in terms of  
18 the other kinds of biodegradable mulches?

19 MS. BEHAR: I think the Technical  
20 Review said it was at least two more years until  
21 the testing would be done to give us the answers  
22 to our questions, especially concerning long-term

1 use. Because if this product is degrading into  
2 the soil, we wanted to know what if someone used  
3 it for five or ten years in the same place; is  
4 there any kind of impact there?

5 DR. THICKE: Any other comments?

6 I guess we're ready to vote, Tom.

7 MR. CHAPMAN: Okay. The motion is to  
8 remove biodegradable, biobased mulch film as  
9 defined in 205.2. It must be produced -- it's  
10 cut off. It must be produced without organisms  
11 or feedstock derived from excluded methods.

12 The motion was made by Harriet and  
13 seconded by Emily.

14 The voting will start with Steve. A  
15 yes vote is to remove; a no vote is to retain.

16 MR. ELA: No.

17 MR. MORTENSEN: No.

18 MR. BUIE: No.

19 MS. SWAFFAR: No.

20 DR. SEITZ: No.

21 MR. RICE: No.

22 MS. BAIRD: No.

1 MS. BEHAR: No.

2 MS. OAKLEY: No.

3 DR. THICKE: No.

4 MS. BRIONES: No.

5 MS. DE LIMA: No.

6 MR. BRADMAN: No.

7 MS. MOSSO: No.

8 MR. CHAPMAN: The chair votes no.

9 Zero yes, 15 no. The motion fails.

10 Before we go on to the next slide, I  
11 forgot to mention, just for the education of the  
12 public, the Board conducts business by decisive  
13 votes of a two-thirds majority only. And just  
14 none of these votes were close but just for that  
15 to be out there in the public knowledge.

16 Sorry, Francis.

17 DR. THICKE: The next item is boric  
18 acid. Lisa.

19 DR. BRINES: Thank you. We are moving  
20 on to paragraph (e) in the same section, as  
21 insecticides (including acaricides or mite  
22 control). (3) Boric acid -- structural pest

1 control, no direct contact with organic food or  
2 crops.

3 And the last Technical Advisory Panel  
4 Report was completed in '95. Thanks.

5 DR. THICKE: And Harriet is the lead.

6 MS. BEHAR: So boric acid is often  
7 used in packing sheds and other facilities. Many  
8 times it is used as a powder introduced into  
9 cracks and crevices and is essential for  
10 controlling ants and roaches.

11 A number of members of the public did  
12 comment regarding the listing of boric acid and  
13 the majority supported relisting.

14 Numerous distributors, food processing  
15 businesses, certifiers, and farmers recommended  
16 relisting as a necessary tool for the control of  
17 ants and roaches in packing houses and food  
18 handling facilities. One certifier noted that it  
19 was not used in any of their certified  
20 operations, however.

21 A few organizations recommended  
22 changing the annotation to read for use only as

1 bait in traps or in gel formulations due to the  
2 issue of the powder could be an irritant.

3 The Crops Subcommittee would consider  
4 a petition regarding this annotation change  
5 sometime in the future.

6 Overall, the public comment was in  
7 favor of relisting this material as an essential  
8 tool for structural pest control. And the vote  
9 was to retain or to not remove; eight to not  
10 remove and one absent.

11 DR. THICKE: Thank you, Harriet. Any  
12 comments or questions on boric acid? Emily.

13 MS. OAKLEY: Steve, I thought I  
14 remembered you saying that you used the powdered  
15 form in cracks and that the gel would be a  
16 difficult use for that.

17 MR. ELA: I don't think it was us but  
18 it was -- I remember it. It wasn't me but it was  
19 somebody on the committee did mention that it was  
20 easier to apply in cracks if it weren't in a gel  
21 or a liquid form. So I think the committee  
22 decided, taking that under advisement decided

1 that that was a viable use, with the lack of  
2 other evidence.

3 DR. THICKE: Other comments or  
4 questions?

5 Okay, Tom, we're ready to vote.

6 MR. CHAPMAN: Okay, the motion is to  
7 remove boric acid as insecticide, including  
8 acaricides or mite control. Boric acid --  
9 structural pest control, no direct contact with  
10 organic food or crops from 205.601(e) based on  
11 the following criteria in OFPA.

12 The motion was made by Harriet and  
13 seconded by Francis. This is a motion to remove.  
14 So a yes vote is to remove; a no vote is to  
15 retain.

16 Voting starts with Dave.

17 MR. MORTENSEN: No.

18 MR. BUIE: No.

19 MS. SWAFFAR: No.

20 DR. SEITZ: No.

21 MR. RICE: No.

22 MS. BAIRD: No.

1 MS. BEHAR: No.

2 MS. OAKLEY: No.

3 DR. THICKE: No.

4 MS. BRIONES: No.

5 MS. DE LIMA: No.

6 MR. BRADMAN: No.

7 MS. MOSSO: No.

8 MR. ELA: No.

9 MR. CHAPMAN: The chair votes no.

10 Zero yes, 15 no and the motion fails.

11 DR. THICKE: The next item up is  
12 sticky traps/barriers. Lisa.

13 DR. BRINES: Thank you. We are  
14 continuing under paragraph (e) As insecticides  
15 (including acaricides or mite control). The  
16 listing is (9) Sticky traps/barriers.

17 And the last Technical Report was  
18 completed in '95. Thanks.

19 DR. THICKE: And Emily.

20 MS. OAKLEY: This is a relatively  
21 uncontentious issue. As we discussed in the  
22 spring, it covers a wide range of traps and

1 coatings made with a number of different  
2 materials.

3 They are typically used for pest  
4 control and monitoring in limited quantities and  
5 in confined areas such as tree trunks. Some non-  
6 specific targeting or trapping can happen,  
7 although that is not targeted, and that can  
8 include spiders, mites, reptiles, and amphibians.  
9 They don't attract them but they can get trapped.

10 To that point, as in our previous  
11 review, there was broad support for relisting it  
12 among farmers, certifiers, and trade  
13 organizations with a comment and a request that  
14 we consider an annotation that would suggest that  
15 the traps be used in a way that prevents non-  
16 target trapping.

17 Any questions?

18 DR. THICKE: Nothing. Okay.

19 MR. CHAPMAN: Okay. So the motion is  
20 to remove sticky traps from 205.601(e). The  
21 motion was made by Emily and seconded by Sue.

22 This is a motion to remove. A yes

1 vote is to remove; a no vote is to retain and the  
2 voting will start with Jesse.

3 MR. BUIE: No.

4 MS. SWAFFAR: No.

5 DR. SEITZ: No.

6 MR. RICE: No.

7 MS. BAIRD: No.

8 MS. BEHAR: No.

9 MS. OAKLEY: No.

10 DR. THICKE: No.

11 MS. BRIONES: No.

12 MS. DE LIMA: No.

13 MR. BRADMAN: No.

14 MS. MOSSO: No.

15 MR. ELA: No.

16 MR. MORTENSEN: No.

17 MR. CHAPMAN: The chair votes no.

18 Zero yes, 15 no. The motion fails.

19 DR. THICKE: So next, we have two  
20 copper materials, coppers, fixed and copper  
21 sulfate. And we will discuss them together and  
22 vote separately on them.

1 Lisa.

2 DR. BRINES: Yes, thanks, Francis.

3 The first listing -- we're under  
4 Section 205.601 (i) As plant disease control. (2)  
5 Coppers, fixed -- copper hydroxide, copper oxide,  
6 copper oxychloride, includes product exempted  
7 from EPA tolerance, provided that copper-based  
8 materials must be used in a manner that minimizes  
9 accumulation in the soil and shall not be used as  
10 herbicides.

11 And the second listing also under  
12 paragraph (i)(3) is copper sulfate -- substance  
13 must be used in a manner that minimizes  
14 accumulation of copper in the soil.

15 And a comprehensive report on these  
16 copper materials was last completed in 2011.

17 Thanks.

18 DR. THICKE: Steve.

19 MR. ELA: So yes, we're going to talk  
20 about both coppers simultaneously. The  
21 overwhelming public comment is in support of it,  
22 that they are extremely critical for disease

1 control on a number of organic crops.

2 The only negative comments were last  
3 spring, where there was some concern that there  
4 was overuse and there was copper residue on  
5 crops. The certifiers said that was very  
6 difficult -- would be very difficult to enforce  
7 but included in the annotations on that.

8 And then there was a comment that was  
9 looking to document multiple alternative attempts  
10 to control the disease, including in-field crop  
11 diversity. So in other words, finding some  
12 alternative to using coppers through diversity or  
13 other cultural practices.

14 But overall, the main emphasis was  
15 coppers are very critical to the organic  
16 industry.

17 DR. THICKE: Any comments, questions?

18 Okay, Tom.

19 MR. CHAPMAN: Okay, so there is two  
20 items. We are going to start with coppers,  
21 fixed. The motion is -- all right, we are going  
22 to go with copper sulfate first to keep our

1 voting sheet easy.

2 Copper sulfate -- the motion is to  
3 remove copper sulfate from 205.601(i). The  
4 motion was made by Steve and seconded by Francis.

5 This is a motion to remove so a yes  
6 vote is to remove; a no vote is to abstain. And  
7 the voting starts with Ashley.

8 MS. SWAFFAR: No.

9 DR. SEITZ: No.

10 MR. RICE: No.

11 MS. BAIRD: No.

12 MS. BEHAR: No.

13 MS. OAKLEY: No.

14 DR. THICKE: No.

15 MS. BRIONES: No.

16 MR. BRADMAN: No.

17 MS. MOSSO: No.

18 MR. ELA: No.

19 MR. MORTENSEN: No.

20 MR. BUIE: No.

21 MR. CHAPMAN: The chair votes no.

22 Zero yes, 14 no, zero abstain, zero

1 recuse, one absent. The motion fails.

2 DR. THICKE: Next up is --

3 MR. CHAPMAN: I have got to vote on  
4 the other one.

5 DR. THICKE: You're right.

6 MR. CHAPMAN: So coppers, fixed the  
7 motion is to remove coopers, fixed from  
8 205.601(i). The motion was made by Steve and  
9 seconded by Emily. It is a motion to remove.

10 A yes vote is to remove; a no vote is  
11 to retain. And the voting will start with Dan.

12 DR. SEITZ: No.

13 MR. RICE: No.

14 MS. BAIRD: No.

15 MS. BEHAR: No.

16 MS. OAKLEY: No.

17 DR. THICKE: No.

18 MS. BRIONES: No.

19 MS. DE LIMA: No.

20 MR. BRADMAN: No.

21 MS. MOSSO: No.

22 MR. ELA: No.

1 MR. MORTENSEN: No.

2 MR. BUIE: No.

3 MS. SWAFFAR: No.

4 MR. CHAPMAN: The chair votes no.

5 Zero yes, 15 no. The motion fails.

6 DR. THICKE: Okay, now up is humic  
7 acids.

8 DR. BRINES: Thank you.

9 We are moving to paragraph (j) As  
10 plant or soil amendments. And the listing is (3)  
11 Humic acids -- naturally occurring deposits,  
12 water, and alkali extracts only.

13 And the most recent Technical Report  
14 was completed in 2012. Thanks.

15 DR. THICKE: Okay, any comments -- oh,  
16 Asa, I'm sorry. Go ahead.

17 MR. BRADMAN: Just overall there has  
18 been a number of comments related to humic acids,  
19 representing up to 40, or 50, or more growers.  
20 And overall, there is overwhelming support for  
21 it.

22 There have been some concerns raised

1 by Beyond Pesticides about its extraction and  
2 manufacturing methods as a process, using, some  
3 people use the term brown coal or you know  
4 partially fossilized materials and the potential  
5 environmental impacts of that.

6 In general, though, there is really  
7 overwhelming support across the board for it and  
8 I don't see any reason to take it off at this  
9 point. And there was a unanimous support in the  
10 subcommittee.

11 DR. THICKE: Okay, Emily.

12 MS. OAKLEY: I believe we have a typo  
13 because it was not -- the motion was not made by  
14 Ashley.

15 DR. THICKE: That's correct.

16 MS. OAKLEY: That would have been made  
17 by Asa. So just correcting that.

18 MR. CHAPMAN: We'll make that  
19 correction when we go to the vote.

20 DR. THICKE: Any other comments?

21 All right, we're ready to vote.

22 MR. CHAPMAN: Okay. So as was stated

1 before -- can you scroll down -- there is a typo  
2 on the record. The motion is by Asa Bradman.  
3 The second is by David Mortensen. That will be  
4 corrected.

5 The motion to remove humic acids from  
6 205.601(j), it is a motion to remove. And voting  
7 starts with Scott.

8 A yes vote is to remove; a note vote  
9 is to retain.

10 MR. RICE: No.

11 MS. BAIRD: No.

12 MS. BEHAR: No.

13 MS. OAKLEY: No.

14 DR. THICKE: No.

15 MS. BRIONES: No.

16 MS. DE LIMA: No.

17 MR. BRADMAN: No.

18 MS. MOSSO: No.

19 MR. ELA: No.

20 MR. MORTENSEN: No.

21 MR. BUIE: No.

22 MS. SWAFFAR: No.

1 DR. SEITZ: No.

2 MR. CHAPMAN: No.

3 Zero yes, 15 no. The motion fails.

4 DR. THICKE: Okay, the next item up is  
5 micronutrients -- soluble boron products.

6 Lisa.

7 DR. BRINES: Thank you. We are  
8 continuing under paragraph (j) as plant or soil  
9 amendments. And the listing is micronutrients --  
10 not to be used as a defoliant, herbicide, or  
11 desiccant. Those made from nitrates or chlorides  
12 are not allowed. Soil deficiency must be  
13 documented by testing. And the listing is (i)  
14 soluble boron products.

15 And the most recent Technical Report  
16 was completed in 2010. Thanks.

17 DR. THICKE: Thank you. Harriet, I  
18 believe.

19 MS. BEHAR: So all public commenters  
20 were supportive of relisting this micronutrient,  
21 calling it essential. Certifiers, distributors,  
22 food processing business, and many individual

1 growers stated their need for this material and  
2 that it is very commonly used.

3 One commenter felt there should be a  
4 way to address overaccumulation of all  
5 micronutrients used by organic growers. I'm not  
6 sure how we'll do that but it's a comment.

7 Others felt that if testing must be  
8 done before micronutrients may be used, the  
9 application may be too late to save the crop or  
10 perennial plant.

11 The subcommittee supported the  
12 proposed annotation change recommended by the  
13 NOSB in October 2015, which stated instead of  
14 stating that soil testing must be documented, it  
15 says that deficiency must be documented and it  
16 takes away the requirement for testing as well.

17 But at this time, that has not been  
18 changed in our regulation.

19 Removing the requirement that there  
20 must be soil testing before allowing application  
21 is problematic for both perennial and annual crop  
22 producers. And there is numerous ways of

1 documenting a deficiency, other than soil  
2 testing. By the time the deficiency is noted, it  
3 may be too late to save the perennial plant or  
4 crop. And this is an essential micronutrient  
5 across all types of crop production.

6 DR. THICKE: Any comments or  
7 questions?

8 MS. BEHAR: We didn't give the vote.  
9 So the Crops Subcommittee vote was eight no to  
10 remove and one absent.

11 DR. THICKE: Thank you, Harriet.  
12 Tom.

13 MR. CHAPMAN: All right, so the motion  
14 is to remove micronutrients, soluble boron  
15 products from 205.601(j). The motion was made by  
16 Harriet; it was seconded by Jesse.

17 This is a motion to remove so a yes is  
18 to remove; a no is to retain. And the voting  
19 starts with Harriet. Sorry, the voting starts  
20 with Sue.

21 MS. BAIRD: No.

22 MS. BEHAR: No.

1 MS. OAKLEY: No.

2 DR. THICKE: No.

3 MS. BRIONES: No.

4 MS. DE LIMA: No.

5 MR. BRADMAN: No.

6 MS. MOSSO: No.

7 MR. ELA: No.

8 MR. MORTENSEN: No.

9 MR. BUIE: No.

10 MS. SWAFFAR: No.

11 MR. RICE: No.

12 MR. CHAPMAN: The chair votes no.

13 Zero yes, 15 no. The motion fails.

14 Francis.

15 DR. THICKE: The next material is

16 vitamins, B1, C and -- oh, the other

17 micronutrients. Excuse me.

18 So micronutrients, sulfates,

19 carbonates, oxides, or silicates of zinc, copper,

20 iron, manganese, molybdenum, selenium, and

21 cobalt.

22 Lisa.

1 DR. BRINES: Thanks, Francis. Yes, we  
2 are still under the same paragraph (j)(6) As  
3 plant or soil amendments. Micronutrients -- not  
4 to be used as a defoliant, herbicide, or  
5 desiccant. Those made from nitrates or chlorides  
6 are not allowed. Soil deficiency must be  
7 documented by testing. And it's under (ii)  
8 sulfates, carbonates, oxides, or silicates of  
9 zinc, copper, iron, manganese, molybdenum,  
10 selenium, and cobalt.

11 And the last Technical Report was done  
12 in 2010. Thanks.

13 DR. THICKE: And Harriet is the lead  
14 on that.

15 MS. BEHAR: So basically the comments  
16 on these micronutrients was pretty much identical  
17 to the previous one we just voted on, the soluble  
18 boron. A lot of supportive comments on relisting  
19 these micronutrients, calling them essential in a  
20 variety of cropping systems. This material also  
21 had the same voted upon and approved by the NOSP  
22 -- NOSB, excuse me, changed to deficiency must be

1 documented instead of must be documented by  
2 testing.

3 And yes, so and then the vote was six  
4 no to remove and three absent.

5 DR. THICKE: Okay, any comments?

6 I guess not.

7 MR. CHAPMAN: Okay, the motion is to  
8 remove micronutrients, sulfates, carbonates,  
9 oxides, and silicate of zinc, copper, iron,  
10 manganese -- I should have been paying attention.  
11 How do I say that, Francis, molybdenum --

12 DR. THICKE: Molybdenum.

13 MR. CHAPMAN: -- selenium, and cobalt  
14 at 205.601(j).

15 The motion was made by Harriet and  
16 seconded by Steve.

17 The voting will start with Harriet.  
18 This is a motion to remove so a yes is to remove  
19 and no is to retain.

20 MS. BEHAR: No.

21 MS. OAKLEY: No.

22 DR. THICKE: No.

1 MS. BRIONES: No.

2 MS. DE LIMA: No.

3 MR. BRADMAN: No.

4 MS. MOSSO: No.

5 MR. ELA: No.

6 MR. MORTENSEN: No.

7 MR. BUIE: No.

8 MS. SWAFFAR: No.

9 DR. SEITZ: No.

10 MR. RICE: No.

11 MS. BAIRD: No.

12 MR. CHAPMAN: The chair votes no.

13 Zero yes, 15 no. The motion fails.

14 DR. THICKE: The next material,

15 vitamins B1, C, and E.

16 Lisa.

17 DR. BRINES: Thank you and I will

18 introduce all three at once. I am going to turn

19 it over to the subcommittee where there are two

20 motions.

21 So we are still under paragraph (j) as

22 plant or soil amendments and it is listing (8)

1 vitamins B1, C, and E.

2 And Technical Report was completed in  
3 2015. Thanks.

4 DR. THICKE: So Emily is the lead and  
5 your splitting them out into two here.

6 MS. OAKLEY: We are because we are  
7 recommending the removal of B1 but the retention  
8 of C and E.

9 And the reason for that is that the  
10 2015 TR was very clear that the available  
11 literature did not support the premise that  
12 foliar and solar applications of vitamin B1 are  
13 responsible for root stimulation in transplanted  
14 crops.

15 Additionally, multiple studies of  
16 vegetable transplants, trees, and flowers  
17 concluded that vitamin B1 had no impact on  
18 seedling vigor, size, color, or root development.  
19 The TR was unable to describe a mode of action  
20 for the substance, quote, in the absence of  
21 significant in vivo results correlating vitamin  
22 B1 applications with enhanced root growth.

1           The TR provides a broad reference to  
2 alternative substances for vitamin B1.  
3 Additionally, there are no OMRI-approved brand  
4 name crop inputs containing B1 in the final  
5 product.

6           We did hear from a few people that  
7 there are some blended fertilizers that do  
8 contain all three but there are multiple other  
9 options that are available for them. So I don't  
10 -- no one has expressed that it would be a  
11 hardship in any way to remove the substance. And  
12 since it doesn't do what it is listed for, I  
13 think it is clear that we should remove it.

14           Are there any questions or discussions  
15 about that?

16           MS. BEHAR: Were there any products in  
17 the marketplace that will come -- that will be no  
18 longer available to organic growers if it has  
19 been bundled?

20           MS. OAKLEY: Well there are at least  
21 six materials that were listed that do contain it  
22 in which it's bundled that growers are using but

1 I don't think the fact that it's bundled in a few  
2 materials is a justification for keeping it  
3 because it is not effective and there are other  
4 materials available.

5 Yes?

6 MR. CHAPMAN: Was it six materials or  
7 six users with the material?

8 MS. OAKLEY: It was materials.  
9 Additionally, I can provide some additional  
10 information that did not come through the public  
11 docket that was provided to me by someone at the  
12 California Department of Food and Agriculture and  
13 they also do not see that this is a substance  
14 that has the efficacy that it claims that it  
15 includes. Although they have a handful of  
16 products registered for it, they don't see it as  
17 something that substantiates its claims.

18 Any other questions? Because this  
19 would be a motion to remove this substance so, if  
20 you have any other questions, that's fine.

21 DR. THICKE: Scott.

22 MR. RICE: Just a quick comment. It

1 was my understanding that those that may have B1  
2 in their formulation could be reformulated and,  
3 if necessary, re-reviewed by a material review  
4 organization and still be available as a tool in  
5 the toolbox.

6 MS. OAKLEY: Thank you.

7 DR. THICKE: Okay, I guess we're ready  
8 to vote.

9 MR. CHAPMAN: Do we want to talk about  
10 C and E and then just do both votes or is there  
11 anything else?

12 MS. OAKLEY: No.

13 MR. CHAPMAN: No.

14 MS. OAKLEY: I think we can just start  
15 with this one.

16 Are there any other questions about C  
17 and E? They are used to promote growth and  
18 yields and to protect plants from oxidative  
19 stress due to salinity but there really wasn't  
20 any public comment strongly in favor of its  
21 removal.

22 There was some concern about

1 potentially deriving these materials from GE  
2 organisms but, as stated previously in the  
3 spring, affidavits can attest to the fact that GE  
4 materials are not used for its production.

5 MR. CHAPMAN: Okay. And then I have a  
6 question for Dr. Brines. And I think I know the  
7 date but I don't want to say it wrong.

8 What is the sunset date that this  
9 material is on. Is it 2022?

10 DR. BRINES: Yes, that's right, March  
11 15, 2022.

12 MR. CHAPMAN: So just a reminder, as  
13 part of our sunset reorganization, this is one of  
14 those materials. And so if this does get voted  
15 to remove, the recommendation as part of that was  
16 for it to get removed on its original time line,  
17 which is 2022.

18 MS. BEHAR: So that would leave plenty  
19 of time for reformulation, would it not?

20 MS. BAIRD: If there really is some  
21 uses for it. Also, a time for someone to come  
22 forward and let us know.

1 MR. CHAPMAN: Okay, we'll move to the  
2 vote?

3 DR. THICKE: We're ready for the vote.

4 MR. CHAPMAN: Okay so the motion is to  
5 remove vitamin B1 from 205.601(j) based on the  
6 following criteria from the Organic Food  
7 Productions Act or 7 CFR 205.600(b), if  
8 applicable: incompatible with a system of  
9 sustainable agriculture due to its unproven  
10 efficacy or need and a lack of essentiality.

11 The motion was made by Emily and was  
12 seconded by Steve.

13 This is a motion to remove. A yes  
14 vote is to remove; a no vote is to retain. And  
15 the voting starts with Emily.

16 MS. OAKLEY: Yes.

17 DR. THICKE: Yes.

18 MS. BRIONES: Yes.

19 MS. DE LIMA: Yes.

20 MR. BRADMAN: Yes.

21 MS. MOSSO: Yes.

22 MR. ELA: Yes.

1 MR. MORTENSEN: Yes.

2 MR. BUIE: Yes.

3 MS. SWAFFAR: Yes.

4 DR. SEITZ: Yes.

5 MR. RICE: Yes.

6 MS. BAIRD: Yes.

7 MS. BEHAR: Yes.

8 MR. CHAPMAN: The chair votes yes.

9 Fifteen yes, zero no. The motion  
10 passes.

11 DR. THICKE: So are there any other  
12 comments or discussion on vitamins C and E?

13 MR. CHAPMAN: Okay, the motion to  
14 remove vitamins C and E from 205.601(j). The  
15 motion was made by Emily and seconded by Harriet.

16 This is a motion to remove. A yes  
17 vote is to remove; a no vote is to retain. And  
18 the voting starts with Francis.

19 DR. THICKE: No.

20 MS. BRIONES: No.

21 MS. DE LIMA: No.

22 MR. BRADMAN: No.

1 MS. MOSSO: No.

2 MR. ELA: No.

3 MR. MORTENSEN: No.

4 MR. BUIE: No.

5 MS. SWAFFAR: No.

6 DR. SEITZ: No.

7 MR. RICE: No.

8 MS. BAIRD: No.

9 MS. BEHAR: No.

10 MS. OAKLEY: No.

11 MR. CHAPMAN: The chair votes no.

12 Zero yes, 15 no. The motion fails.

13 DR. THICKE: So next we have two items

14 from 205.602 that are nonsynthetic substances

15 prohibited for use in organic crop production.

16 And the first one up is lead salts.

17 Lisa.

18 DR. BRINES: Okay, thanks, Francis.

19 Yes, we are moving on to, as you said,

20 Section 205.602 of the National List,

21 nonsynthetic substances prohibited for use in

22 organic crop production and the first listing is

1 under paragraph (d) lead salts.

2 Thanks.

3 DR. THICKE: I'm the lead on this one.

4 There were very few comments on lead salts and  
5 its consensus that we should leave it on the  
6 list, keep it prohibited for organic crop  
7 production. And the committee voted unanimously  
8 to keep it on the prohibited list.

9 Any comments or questions?

10 Harriet.

11 MS. BEHAR: In the past, it has been  
12 used in my region, I believe on apples. And it  
13 has just -- we have a lot of remediation problems  
14 because it doesn't really move.

15 DR. THICKE: Okay. Okay, so no other  
16 comments. And we're ready to vote.

17 MR. CHAPMAN: Can we scroll down?

18 Okay, this is a prohibited natural.  
19 It is a motion to remove lead salts from 205.602.  
20 The motion was made by Francis and seconded by  
21 Emily.

22 A yes is to remove the prohibited and

1 no is to retain it as a prohibited. The voting  
2 will start with A-Dae.

3 MS. BRIONES: No.

4 MS. DE LIMA: No.

5 MR. BRADMAN: No.

6 MS. MOSSO: No.

7 MR. ELA: No.

8 MR. MORTENSEN: No.

9 MR. BUIE: No.

10 MS. SWAFFAR: No.

11 DR. SEITZ: No.

12 MR. RICE: No.

13 MS. BAIRD: No.

14 MS. BEHAR: No.

15 MS. OAKLEY: No.

16 DR. THICKE: No.

17 MR. CHAPMAN: The chair votes no.

18 Zero yes, 15 no. The motion fails.

19 DR. THICKE: And the next item, the  
20 last item of sunsets is tobacco dust.

21 Lisa.

22 DR. BRINES: Thank you. Yes, we are

1 still under Section 205.602 and the listing is  
2 under paragraph (i) Tobacco dust (nicotine  
3 sulfate).

4 Thanks.

5 DR. THICKE: The lead is Harriet.

6 MS. BEHAR: So public commenters, both  
7 this time and the previous time, were from  
8 certifiers and businesses, and public interest  
9 organizations and all agreed that the product  
10 should remain listed as a prohibited  
11 nonsynthetic.

12 It was noted by two certifiers and  
13 OMRI that this is currently allowed as a natural  
14 agricultural product to be incorporated into the  
15 soil or as compost feedstocks, while tobacco  
16 dust, tea, and smoke are prohibited under the  
17 USDA Organic Regulations.

18 So we voted as a subcommittee to keep  
19 it retained. However, we might look at, in the  
20 future, at the use of it as a soil amendment or a  
21 compost feedstock.

22 In addition, in the Livestock

1 Subcommittee, I have heard animal health  
2 practitioners discuss the use of tobacco dust as  
3 a parasiticide, an external parasiticide. I  
4 don't know since we have it -- because it is not  
5 listed in the livestock prohibited. So maybe it  
6 will get on the work agenda; maybe not. We'll  
7 talk about it.

8 There really is no product available  
9 on the market but it could still be homemade.

10 And our vote was eight to not remove  
11 from the prohibited nonsynthetic list and one  
12 absent.

13 DR. THICKE: Okay, thank you.

14 Any questions or comments?

15 Okay, I guess we're ready to vote,  
16 Tom.

17 MR. CHAPMAN: All right. This is a  
18 prohibited synthetic and the motion is to remove  
19 tobacco dust from 205.602. The motion was made  
20 by Harriet and was seconded by Joelle.

21 A yes vote is to remove from the  
22 prohibited list; a no vote is to retain. The

1 voting will start with Lisa.

2 MS. DE LIMA: No.

3 MR. BRADMAN: No.

4 MS. MOSSO: No.

5 MR. ELA: No.

6 MR. MORTENSEN: No.

7 MR. BUIE: No.

8 MS. SWAFFAR: No.

9 DR. SEITZ: No.

10 MR. RICE: No.

11 MS. BAIRD: No.

12 MS. BEHAR: No.

13 MS. OAKLEY: No.

14 DR. THICKE: No.

15 MS. BRIONES: No.

16 MR. CHAPMAN: The chair votes no.

17 Zero yes, 15 no. The motion fails.

18 DR. THICKE: So, Tom, do you want to

19 move on to the next item or do you want to --

20 when do you want to take a break?

21 MR. CHAPMAN: You tell me but maybe we

22 go through a couple of petitions and then take a

1 break.

2 DR. THICKE: That would be fine.

3 Okay so the next up is a petition for  
4 fatty alcohols. And Jesse has the lead on that.

5 Are you going to --

6 DR. BRINES: Yes, I will go ahead and  
7 introduce it before turning it over to Jesse.

8 Thank you.

9 The petition is for fatty alcohols, a  
10 mix of octanol and decanol. The petition was  
11 submitted to the program on November 12, 2015.  
12 There is a petition addendum that was submitted  
13 on June 12, 2017. And both the petition and  
14 addendum are posted on the NOP website.

15 The petition was submitted by Green Ag  
16 Supply, LLC and it requests the addition of fatty  
17 alcohols to Section 205.601 of the National List  
18 for sucker control.

19 In support of the review, the Crops  
20 Subcommittee did request the development of a  
21 Technical Evaluation Report, which was completed  
22 in 2017. And this is the first meeting at which

1 this material will be discussed. The material  
2 has not been previously classified by the Board.

3 Thanks.

4 DR. THICKE: Thank you, Lisa.

5 Jesse.

6 MR. BUIE: Fatty alcohols, octanol and  
7 decanol are monohydric aliphatic alcohols  
8 containing eight and ten carbons, respectively,  
9 with a single hydroxyl group.

10 The petitioner proposes to use the  
11 fatty alcohol blend for topping and sucker  
12 control on organic crops. The Technical Review  
13 indicates the specific use of fatty alcohol  
14 substance to be to chemically remove flower buds  
15 and suckers from tobacco plants.

16 The EPA has only approved fatty  
17 alcohols for the use as a growth regulator on  
18 tobacco and the technical review only covered the  
19 use of fatty alcohols for use on tobacco.

20 The Crops Committee does not think the  
21 use of a synthetic growth regulator is compatible  
22 with a system of sustainable and organic

1 agriculture.

2 DR. THICKE: Harriet.

3 MS. BEHAR: I'd like to make a motion  
4 to send it back to the subcommittee.

5 DR. THICKE: I'll second it.

6 Emily?

7 MS. OAKLEY: So Francis and I are  
8 going to disagree.

9 I think that we should go ahead and  
10 vote on this material now. I understand the  
11 concerns of the petitioner but he first started  
12 contacting the NOSB and the NOP mid- to late  
13 September and there was a great deal of time to  
14 continue to make public comments written. And at  
15 the time, the webinar was not at all full. So  
16 farmers could have spoken on the webinar if they  
17 had chosen to.

18 And as Steve stressed when we spoke  
19 with him, I feel that the lack of written  
20 comments on the docket now, other than to request  
21 that we send it back, don't provide us with  
22 substantial information to justify a change in

1 the deliberations that we took over the Crops  
2 Subcommittee, which were lengthy and over many  
3 meetings and were not at all quick or hasty.

4 I don't think sending it back would  
5 change our outcome.

6 MR. MORTENSEN: I had a similar  
7 feeling from the many times we discussed this on  
8 the phone together and reread the documents. So,  
9 I agree with Emily.

10 DR. THICKE: Thank you, Dave.

11 Ashley, did you have your hand up?

12 MS. SWAFFAR: So I agree with you,  
13 Emily, also. You know I think the petitioner did  
14 not take advantage of the written public comment.  
15 You know to think for the entire audience to know  
16 we look at every comment the same whether you  
17 give it to us in person or written. A lot of  
18 times written comments help us even more so  
19 because we can really think it over and do some  
20 other research, instead of trying to research on  
21 the fly.

22 So I was really disappointed that of

1 the seven times fatty acid came up in the  
2 regulations.gov, it was a lot of consumer  
3 organizations and then the petitioner asking us  
4 to take it back.

5 So I think that they missed the boat  
6 on that one. I would be in support of voting on  
7 this.

8 DR. THICKE: Tom and then Harriet.

9 MR. CHAPMAN: I think Asa was before  
10 me.

11 DR. THICKE: I didn't see you Asa. Go  
12 ahead.

13 MR. BRADMAN: I just I mean for me, in  
14 terms of the committee discussions, the fact that  
15 it was submitted for all crops but EPA only has  
16 it approved for tobacco, to me then it was just a  
17 nonissue because the request was for beyond its  
18 approved use. So I felt like there was  
19 inconsistency there.

20 I would be willing to reconsider that,  
21 if it came back to committee to really focus on  
22 whether we are talking all crops or just tobacco.

1 I understand the TR focus just on tobacco.

2 DR. THICKE: Tom.

3 MR. CHAPMAN: I agree with everything  
4 I heard here from all the subcommittee members  
5 and I, as chair, often listen in on calls, even  
6 if I'm not on the subcommittee. And I can attest  
7 that there was an in-depth discussion and review  
8 of this item. And I agree that I doubt any  
9 additional information will change their outcome.

10 However, I do generally acquiesce to  
11 requests for delay, especially if this is not a  
12 listed item, the delay will not continue a  
13 listing of an item.

14 So I will vote for this motion but I  
15 also agree that I have no confidence that it's  
16 probably going to change anything. And I agree  
17 with the concerns that there were several  
18 opportunities for additional public comment that  
19 were not utilized.

20 DR. THICKE: Harriet and then Emily.

21 MS. BEHAR: I made the motion to send  
22 it back to the subcommittee so that we would have

1 a public discussion about whether or not we  
2 wanted to but I don't think -- but personally, I  
3 am not going to vote for my own motion because we  
4 reviewed the material as we could. We reviewed  
5 it for use on tobacco, which is all we can really  
6 do and we did a robust review. And I think we're  
7 ready to vote but I thought it was important that  
8 we had this discussion.

9 DR. THICKE: Emily.

10 MS. OAKLEY: Two comments. One is  
11 that I also would just encourage stakeholders to  
12 make their comments via the open docket, rather  
13 than individually to the NOP or the NOSB because  
14 that makes this process clear for all of the  
15 stakeholder community and those communications  
16 that happened just with us individually, we're  
17 not available to everyone else and I have  
18 concerns about that.

19 Secondly, the reason I don't think  
20 that we should send this back is that it is a  
21 petition material. It is not the action of  
22 removing a substance. It does add to our

1 workload unnecessarily, when we have already done  
2 the work on this petition.

3 DR. THICKE: Okay I just want to make  
4 a comment that what Asa brought up, the NOSB has,  
5 in the past, restricted some requests that were  
6 more broad and then we restricted them down in an  
7 annotation. So we have done that in the past.  
8 So it is a possibility.

9 Did you have your hand up, Lisa?  
10 Okay, go ahead.

11 MS. DE LIMA: Since I'm not on the  
12 Crops Subcommittee, I wasn't on those calls. Can  
13 you talk a little bit about why you don't think  
14 the vote would be any different if we sent it  
15 back and brought it back?

16 DR. THICKE: Who wants to do that?  
17 Emily? Jesse?

18 MR. BUIE: Well, I guess the main  
19 issue is that the petitioner requested the use of  
20 the product on all organic crops, where the TR  
21 only discussed its use on tobacco.

22 MS. DE LIMA: So it's not for like an

1 environmental reason.

2 MR. BUIE: No.

3 DR. THICKE: Emily wants to talk about  
4 that I can see.

5 MS. OAKLEY: Yes, I mean I would just  
6 add that I don't think our deliberations were  
7 based on whether or not it would be used for all  
8 crops or tobacco. It was that we were very  
9 firmly in belief that such a material plant  
10 growth regulator was not appropriate for use in  
11 organic production and that there are viable  
12 alternatives, namely, handpicking and removal of  
13 the buds, and that we shouldn't a material, a  
14 synthetic such as this that is inconsistent with  
15 our understanding of the principles of organic  
16 agriculture.

17 I also had some concerns with respect  
18 to the TR and the sources of these materials but  
19 I won't go into all those details. Those were  
20 deliberated on the call. But yes, there were  
21 environmental concerns.

22 DR. THICKE: Steve.

1                   MR. ELA: I would echo what Emily  
2 says. It wasn't just based on procedural  
3 dynamics. I mean I think that would be -- then  
4 you could have a reasonable argument but it was  
5 that the material itself would reasonably be  
6 rejected, regardless of what the petition said.

7                   DR. THICKE: Harriet.

8                   MS. BEHAR: And we did not look at it  
9 that oh, it's tobacco so we don't want to grow  
10 organic tobacco either. We weren't prejudiced  
11 against the plant itself, either. It was more  
12 its use and its place -- its basic mechanism in  
13 the environment and on the plant.

14                  DR. THICKE: Scott.

15                  MR. RICE: Yes, we heard from a couple  
16 of certifiers that they have gotten requests to  
17 use this specifically for tobacco. But I can  
18 understand the Crops Subcommittee's deliberations  
19 that this may not be essential, or necessary, or  
20 parallel, or in line with organic principles.

21                               And on the subject of sending it back,  
22 I think I would echo Tom's comments that it will

1 still be not allowed, whether we vote on it today  
2 or not, with all due respect to workload. It  
3 might just be putting it back on for additional  
4 comment, as we did with marine materials.

5 DR. THICKE: Yes, I don't disagree  
6 with those assessments. It is likely to be the  
7 same vote, if we do send it back.

8 I feel, though, I was in the middle of  
9 a miscommunication so I will probably vote to  
10 send it back. And I won't be here anyway.

11 Any other comments?

12 MR. BRADMAN: I just, the  
13 representative from Florida Organic Growers also  
14 suggested we hear from other growers and things  
15 like that. And we all love Marty and so that  
16 made me a little more open to hearing some more  
17 about this.

18 DR. THICKE: Steve.

19 MR. ELA: Yes, but I come back to  
20 there was the webinar and there were written  
21 comments. I mean there was nobody shutting down  
22 the conversation. It wasn't because there wasn't

1       adequate time. It was -- there was time.

2                       So I mean we have a process and I  
3 think, because of workload, people need to  
4 respect that process.

5                       DR. THICKE: Okay. It looks like  
6 we're ready for a vote.

7                       MR. CHAPMAN: Okay. This is not a  
8 motion about business and, therefore, it follows  
9 the Robert's Rules of Order. And as such, it is  
10 a simple majority vote. So eight votes are all  
11 that are necessary to send this motion back.

12                      The motion is to refer back to  
13 subcommittee the petition on fatty alcohols.

14                      The voting will start with Asa. And  
15 so in this case, a yes vote is to refer back to  
16 the subcommittee; a no vote is to continue  
17 deliberation here.

18                      MR. BRADMAN: Yes.

19                      MS. MOSSO: No.

20                      MR. ELA: No.

21                      MR. MORTENSEN: No.

22                      MR. BUIE: No.

1 MS. SWAFFAR: No.

2 DR. SEITZ: No.

3 MR. RICE: Yes.

4 MS. BAIRD: Yes.

5 MS. BEHAR: No.

6 MS. OAKLEY: No.

7 DR. THICKE: Yes.

8 MS. BRIONES: Yes.

9 MS. DE LIMA: No.

10 MR. CHAPMAN: The chair votes yes.

11 Six yes, nine no. The motion fails.

12 DR. THICKE: Okay, I guess we're ready

13 for the real vote here, unless there are any

14 other comments on the substance of the material.

15 MR. CHAPMAN: I have a question.

16 DR. THICKE: Yes.

17 MR. CHAPMAN: So this is a synthetic.

18 The reasoning from the subcommittee was that it

19 is a synthetic growth regulator. Are there other

20 synthetic growth regulators on the crops list

21 and, if so, how is this different?

22 DR. THICKE: Okay, there is ethylene,

1 I believe, for pineapple flowering and that was  
2 very controversial. And so it probably isn't  
3 different then. It wasn't like shooed through.

4 Steve.

5 MR. ELA: I think Francis is right and  
6 I don't know the complete list so I can't say  
7 there's nothing else. But since there were  
8 alternatives in hand labor or other ways, it  
9 wasn't that this was the only way the crop could  
10 be grown. And so to put a synthetic in when  
11 there were organic alternatives seemed  
12 antithetical.

13 I, personally, raised the labor issue  
14 that I don't think people love working in tobacco  
15 and there are dermal toxicities and such. But it  
16 still seems that there are -- this is not -- this  
17 may be convenient and very useful, and cheaper to  
18 raise the crop but it's not critical to raise the  
19 crop. And I think that is the fundamental  
20 difference as we evaluate synthetic materials.

21 DR. THICKE: Tom.

22 MR. CHAPMAN: So I do remember the

1 most recent sunset discussion on ethylene in  
2 Vermont. And one of the arguments made by the  
3 pineapple industry was that it was -- there were  
4 human health impacts related to going out into  
5 the pineapple fields with the sharp edges of the  
6 plant and such during the varied harvest times.  
7 So uniform harvesting was important to them.

8 Is this purely a labor economic issue  
9 on the labor side or is there human health  
10 implications? How well were they considered? I  
11 know you touched on it a little bit there, Steve.

12 MR. ELA: Well, my response would be I  
13 brought that up as a personal knowledge, not that  
14 it was brought up in public comment, or via the  
15 petition, or in the TR.

16 So it wasn't a big enough scale issue  
17 to hit the radar. I brought it up antithetically  
18 from personal knowledge.

19 DR. THICKE: Emily.

20 MS. OAKLEY: If there is any toxicity  
21 associated with the labor, it's associated with  
22 the crop itself. So they are growing a toxic

1 crop. It's not that -- which is like a unique  
2 situation in this case but it's not a scratching  
3 in relation to pineapple.

4 But it has been done for a very long  
5 time without this material, with no adverse  
6 effects represented in the petition.

7 MR. MORTENSEN: And we did, on two  
8 separate occasions, discuss the physical contact,  
9 the hand suckering versus something else.

10 Personally, I have worked in tobacco  
11 in doing research and have been with work crews  
12 in the field. It's not comfortable but we  
13 concluded from the various discussions we had  
14 that it was certainly doable.

15 MS. SWAFFAR: Yes, so I am not  
16 familiar with growing the tobacco crop. And I'm  
17 just wondering if this topping that is done by  
18 hand is actually really practical. Are these  
19 people going out into 40- or 100-acre fields?  
20 You know if you are growing corn and things like  
21 that, you are not going out and individually  
22 silking each ear of corn like a lot of people

1 used to do.

2 And then I had a question on the  
3 alternatives. Also you said that soybean oil or  
4 mineral oil, which actually mineral oil couldn't  
5 be applied to organic crops, but soybean oil  
6 could be applied to also be an alternative. Is  
7 that effective? Do you know anything?

8 MS. OAKLEY: I'll let Jesse answer  
9 that because he is the lead.

10 DR. THICKE: Jesse?

11 MR. BUIE: I mean it's effective. I  
12 guess the issue is what the petition was  
13 requesting.

14 MS. SWAFFAR: Are they easier?

15 MR. BUIE: I don't know.

16 DR. THICKE: Emily.

17 MS. OAKLEY: I do just want to say  
18 that my knowledge is not vast but these farms  
19 don't tend to be hundreds and hundreds of acres,  
20 as you would see in corn. They are smaller scale  
21 operations because they do require a lot of  
22 labor. That's historically how they have

1 operated.

2           So I did actually have a farmer  
3 visiting me from North Carolina, and he is in a  
4 very tobacco-heavy growing area, while we were  
5 deliberating this. And he said that in many  
6 cases, when he started farming organically 40  
7 years ago, he was surrounded by conventional  
8 tobacco fields but over the past several decades,  
9 and especially more recently, in order to remain  
10 viable, they are converting to organic  
11 production.

12           So I think that there are a number of  
13 smaller scale organic operations that are  
14 happening in that area.

15           DR. THICKE: Scott.

16           MR. CHAPMAN: Sorry. Can I do a point  
17 of personal privilege?

18           We have been asked by the  
19 transcriptionist to speak up because it's a  
20 little hard hearing folks. So, please speak up,  
21 folks, into your microphones.

22           Sorry, Scott.

1 MR. RICE: Thank you.

2 I just had a point of clarification  
3 for the motion that we have is to add fatty  
4 alcohols for use in organic crop production. So  
5 is it that potentially it doesn't -- where that  
6 motion would not limit us to tobacco if  
7 additional label use were added at a later date.

8 Is that my understanding?

9 DR. THICKE: That's correct.

10 MR. RICE: Okay.

11 DR. THICKE: Harriet.

12 MS. BEHAR: And I wouldn't vote for it  
13 for just tobacco but the fact that it is for  
14 other crop production, we did not review a TR for  
15 use on tomatoes or any other crops because we  
16 couldn't get a TR on something that is not  
17 approved by the EPA. So that will be an  
18 additional reason why I will not vote to put this  
19 on the national list as an approves synthetic.

20 In my region, we have, in the past,  
21 grown quite a bit of tobacco. It's not as high  
22 quality as the tobacco grown in the south. It is

1 used mostly for chewing tobacco. And it is kind  
2 of a family crop. You know people would have  
3 five, ten acres.

4 And Ashley, there still is quite a bit  
5 of hand detasseling being done in my region.

6 DR. THICKE: Of corn you are talking  
7 about.

8 MS. BEHAR: Of course, yes, of corn,  
9 not of tobacco.

10 But they are removing -- I actually  
11 helped on an organic farm at one point helping  
12 remove suckers on tobacco. Hot job.

13 DR. THICKE: Steve.

14 MR. ELA: Well and to Ashley's point,  
15 I mean I would love to have one of these  
16 materials for thinning apples. I mean we  
17 personally have 25 acres of apples that get  
18 thinned by hand. And you know labor is obviously  
19 not a disqualifier and corn is not the only thing  
20 that has tremendous hand labor involved in the  
21 crop production. So it is a fair playing field.

22 DR. THICKE: Emily.

1 MS. OAKLEY: Yes, I echo that  
2 sentiment on tomato sucker removal for pruning  
3 tomatoes. It is a labor-intensive activity but  
4 it is simply part of the job, in my view.

5 DR. THICKE: Okay. Is that about it  
6 for discussion?

7 Oh, Dave.

8 MR. MORTENSEN: I guess at a time when  
9 growth regulator synthetic, oxyntic growth  
10 regulator, herbicides are rapidly increasing in  
11 use in conventional agriculture, the thought of  
12 us moving ahead with oxyntic growth regulation,  
13 applications to plants in organic agriculture  
14 seems counter to my sort of thinking about the  
15 direction we should be going. So it's just  
16 another thought.

17 2,4-D and Dicamba, for example, in  
18 conventional agriculture, I'm not saying they are  
19 the same but they are growth regulator compounds  
20 that affect plants by altering their growth  
21 behavior in a similar way that an alcohol affects  
22 the growth of flowers on tobacco.

1 DR. THICKE: Any other comments?

2 A-Dae.

3 MS. BRIONES: So I am just a little  
4 confused. So there is no possibility that the  
5 petitioner can repetition this substance for --  
6 if they say for only the use in tobacco  
7 production?

8 DR. THICKE: Emily, do you want to  
9 answer that?

10 MS. OAKLEY: I'm going to answer that  
11 indirectly, which is that whatever this motion  
12 listing is is not irrelevant but it is only EPA  
13 approved for tobacco and that would supersede any  
14 decision that we would ever make.

15 So in essence, we are basically voting  
16 for it for tobacco because that is its only EPA  
17 approved use at the moment.

18 MR. CHAPMAN: Does Dr. Brines want to  
19 say anything?

20 DR. BRINES: Yes, I guess we are in  
21 agreement with that. So if the petition were to  
22 be re-petitioned with the only change being

1 limiting the scope to tobacco, that would not be  
2 new information because the program's decision  
3 when it moved it forward was that that was the  
4 only eligible use. So that is what is before the  
5 Board right now.

6 They could make other changes to the  
7 petition that could warrant reconsideration by  
8 the Board but any petitioner has that as an  
9 option.

10 DR. THICKE: Thank you for that  
11 information.

12 Are we ready to vote? I think so,  
13 Tom.

14 MR. CHAPMAN: All right. So this  
15 motion, the first -- there is two motion that  
16 come to us. The first motion is a classification  
17 motion. It is just to classify the substance as  
18 synthetic or nonsynthetic. The motion is to  
19 classify fatty alcohols, octanol and decanol mix  
20 as petitioned as synthetic. The motion was made  
21 by Jesse and seconded by Emily.

22 So a yes vote is to vote it as

1 synthetic. A no vote is to say it is not  
2 synthetic. The voting will start with Joelle.

3 MS. MOSSO: Yes.

4 MR. ELA: Yes.

5 MR. MORTENSEN: Yes.

6 MR. BUIE: Yes.

7 MS. BRIONES: Yes.

8 DR. SEITZ: Yes.

9 MR. RICE: Yes.

10 MS. BAIRD: Yes.

11 MS. BEHAR: Yes.

12 MS. OAKLEY: Yes.

13 DR. THICKE: Yes.

14 MS. BRIONES: Yes.

15 MS. DE LIMA: Yes.

16 MR. BRADMAN: Yes.

17 MR. CHAPMAN: The chair votes yes.

18 Fifteen yes, zero no. The motion  
19 passes.

20 The next motion is the listing motion.  
21 So this is the motion whether or not to add it to  
22 the National List. The motion comes to us as a

1 motion to add fatty alcohols, octanol/decanol mix  
2 as petitioned to 205.601(k)(2) for use in organic  
3 crop production.

4 The motion was made by Jesse and  
5 seconded by Emily. This is a motion to add. And  
6 so a yes vote is to add it. A no vote is to not  
7 list it.

8 The voting will start with Steve.

9 MR. ELA: No.

10 MR. MORTENSEN: No.

11 MR. BUIE: No.

12 MS. SWAFFAR: No.

13 DR. SEITZ: No.

14 MR. RICE: No.

15 MS. BAIRD: No.

16 MS. BEHAR: No.

17 MS. OAKLEY: No.

18 DR. THICKE: No.

19 MS. BRIONES: No.

20 MS. DE LIMA: No.

21 MR. BRADMAN: No.

22 MS. MOSSO: No.

1 MR. CHAPMAN: The chair votes no.  
2 Zero yes, 15 no. The motion fails.  
3 Do you want to do this or should we  
4 break?

5 DR. THICKE: Do you think it is going  
6 to take very long, Emily?

7 MS. OAKLEY: I was going to read a bit  
8 about the petition and the proposal because there  
9 is a broader issue here that I wanted to address.  
10 So it probably would be good to take a break, if  
11 you want to take on now.

12 MR. CHAPMAN: Okay.

13 MS. OAKLEY: Not that I am going to  
14 take like 20 minutes, but it's --

15 MR. CHAPMAN: Let's push forward.

16 MS. OAKLEY: Push forward? Okay, all  
17 right.

18 DR. THICKE: So anaerobic digestate.

19 DR. BRINES: Okay, so I will proceed  
20 with introducing the next and final petition that  
21 came in from the Crops Subcommittee for this  
22 meeting, which is the petition for anaerobic

1       digestate.

2                   This petition was received by the  
3       program on April 5, 2016. It was petitioned by  
4       Cenergy USA. The petition requests an amendment  
5       to Section 205.203 of the regulations. So it is  
6       not a standard petition which would request  
7       addition, deletion, or amendment to 205.601.

8                   In support of the review, the Crops  
9       Subcommittee requested the evaluation by --  
10      requested the development of a third party  
11      Technical Evaluation Report and that report was  
12      completed earlier this year.

13                  Both the petition and the Technical  
14      Report are available to the public on the NOP  
15      website.

16                  Thanks.

17                  MS. OAKLEY: First I just wanted to  
18      say that this was a really thorough petition and  
19      it was very helpful for our deliberation. And  
20      thank you to whoever wrote it.

21                  We also added supplemental questions  
22      to this Technical Review and those were answered

1 for us.

2 So to begin, the petition requests  
3 that anaerobic digestate fiber or digestate  
4 produced without synthetic materials be allowed  
5 for use in organic production exclusive of days-  
6 to-harvest restrictions following application.

7 This petition, in particular, is for  
8 anaerobic digestate derived from plant and animal  
9 products in a two stage mixed plug-flow digester.

10 During the first stage of production,  
11 the raw waste is mixed and heated to 101 degrees  
12 Fahrenheit. Either reclaimed waste heat or a  
13 boiler is used to maintain the digester  
14 temperature for the growth of methanogenic  
15 bacteria. Waste materials from the first state  
16 gravity flow into the second stage of the vessel.  
17 Here, the methanogenic bacteria convert volatile  
18 fatty acids and acetic acids produced in the  
19 first stage of the anaerobic digestate vessel  
20 into a biogas. Heat mixes the material in a  
21 rotational motion, and it is held at 101 degrees  
22 Fahrenheit for 21 days. Next, the waste flows

1       into an effluent collection pit for additional  
2       processing. The liquid and solids are separated  
3       and a fiber of 30 to 35 percent solid material is  
4       produced. And that's important because it  
5       relates to our deliberations as to whether not  
6       this meets a compost standard or raw animal  
7       manure standard.

8                 However, the petitioner states the  
9       digestate is not raw manure or compost. It is  
10      virtually pathogen-free and, therefore, should  
11      not be restricted. They suggest that the two  
12      stage mixed plug-flow anaerobic digestate  
13      produces a material that is equivalent to OMRI's  
14      classification of processed manure.

15                While this classification specifies a  
16      minimum temperature of 150 degrees Fahrenheit for  
17      at least one hour and a maximum moisture content  
18      of 12 percent, the petitioner proposes that these  
19      temperature, duration, and drying criteria are  
20      unnecessary for pathogen kill when using their  
21      digestion process.

22                And then the reason I am taking a

1 little more time is that this is not just a  
2 single petition kind of in a vacuum regarding  
3 anaerobic digestate. There is a bit more history  
4 to it.

5 In addition to anaerobic digestate,  
6 other manufactures employ heat without drying or  
7 a moisture reduction process without heating to  
8 treat manure. NOP 5006 requests that the CS also  
9 evaluate these treatment processes to determine  
10 if they should be allowed without a pre-harvest  
11 interval.

12 Following the adoption of the Food  
13 Modernization Safety Act, the FDA undertook a  
14 risk assessment of produce grown with manure.  
15 The CS is awaiting the outcome of the FDA's  
16 assessment and will then determine how to  
17 evaluate these other manure treatment methods as  
18 a separate work agenda item in the future.

19 So there was public comment requesting  
20 that we look at other materials and that we  
21 follow up on this memo. But I just want assert  
22 we claim we will be waiting for the FDA before we

1 determine if and how to proceed with this  
2 additional matter of either a liquid anaerobic  
3 digestate, other feedstocks, et cetera.

4 Our primary concern with this material  
5 was that the Technical Review is very clear that  
6 there are no guarantees of pathogen elimination  
7 and, in fact, they can remain. And so when we  
8 discussed this and looked at it for compatibility  
9 under the category of adverse impacts, I am going  
10 to quote from the TR: The principal human health  
11 concern from anaerobic digestate is foodborne  
12 pathogens. Several peer-reviewed papers document  
13 that foodborne pathogens commonly survive the  
14 anaerobic digestion process. IN particular,  
15 spore-forming pathogens are the most likely to  
16 remain viable after the anaerobic digestion  
17 process.

18 Several pathogens are able to survive  
19 or at least remain viable after anaerobic  
20 digestate that would be unlikely to survive  
21 aerobic composting.

22 Again, from the TR, the petition

1 claims that the pathogen reduction in plant and  
2 animal materials properly processed in a two  
3 stage mixed plug-flow anaerobic digester produced  
4 an equivalent heating process to aerobic  
5 composting, as specified in the NOP regulations  
6 at 205.203(c)(2).

7 Laboratory analyses were included in  
8 the petition but the sampling methodology was not  
9 described. The results were not peer-reviewed.  
10 While anaerobic digestate is not raw manure, it  
11 is not aerobically composted. The temperature  
12 reported in the petition is 101 degrees  
13 Fahrenheit, as I mentioned earlier. This is in  
14 the mesophilic range and below the temperature of  
15 131 degrees Fahrenheit specified in the NOP  
16 regulations for composting manure.

17 In the production of anaerobic  
18 digestate from sewage sludge, the EPA requires  
19 that the material go through aerobic composting  
20 under the same conditions stipulated in  
21 205.203(c)(2), a process called further reducing  
22 pathogens. Aerobic composting of the digestate

1 is a process to significantly reduce pathogens,  
2 which doesn't occur in anaerobic digestate.

3 In terms of alternatives and  
4 compatibility, organic producers employ a wide  
5 range of practices to foster soil, health, and  
6 fertility, including cover cropping,  
7 incorporating crop residue, crop rotation, and  
8 conservation no-tillage techniques. There are  
9 numerous alternative materials to digestate  
10 fiber.

11 Anaerobic digestate may currently be  
12 used in organic production as an ingredient in  
13 compost or as a manure, subject to the required  
14 pre-harvest intervals required of raw manures in  
15 205.203.

16 Because of the potential for negative  
17 effects on human health through foodborne  
18 pathogens, the unproven safety of anaerobic  
19 digestate fiber and the many alternative  
20 practices and materials already in use in organic  
21 production, this substance, as petitioned,  
22 without pre-harvest application intervals was

1 deemed not compatible with a system of  
2 sustainable agriculture.

3 And I wanted to not turn the spotlight  
4 on Joelle, but if you would like to elaborate  
5 further as a microbiologist, I would love to hear  
6 your thoughts.

7 MS. MOSSO: Sure. So obviously a lot  
8 of deliberation happened in regards to anaerobic  
9 digestate within the Crops Subcommittee. I think  
10 of import is that in the Technical Review, it was  
11 rather apparent, in fact actually labeled, that  
12 it would be at a mesophilic range that would not  
13 be sufficient to take care of what we know to be  
14 human pathogens of concern when it comes to  
15 agricultural production.

16 Additionally, I do think it is of note  
17 that it is more of a question of timing. As  
18 Emily said, this is not a prohibited material.  
19 It is in regards to the application time from  
20 when you can apply it to when you can harvest the  
21 crop. As such, it can certainly still be used,  
22 assuming it meets all other conditions of organic

1 production.

2           What I would like to emphasize is that  
3 this material is probably the first of many or  
4 not even maybe the first, where NOSB is being  
5 asked to probably make decisions that are not  
6 within our purview or expertise. Being a  
7 civilian board, I don't think it would be right  
8 for the NOSB to make a judgment call on the food  
9 safety impact that a potential material may have.

10           And as such, future petitions that may  
11 be in regards to materials that have sensitive  
12 natures like this, should come in complement with  
13 the appropriate authority's approval.

14           In this case, had anaerobic digestate  
15 come with an EPA letter or an FDA letter that  
16 said it had sufficiently addressed food safety  
17 concerns, I think the NOSB would have been able  
18 to make a more deliberate decision for organic  
19 production instead of the onus being put on the  
20 NOSB to make a food safety decision.

21           MS. OAKLEY: Are there other  
22 discussion -- I mean, I guess Francis, do you

1 want to call on people?

2 Okay, Dan.

3 DR. SEITZ: Apart from food safety,  
4 I'm just curious to know where is the product  
5 obtained from that companies use to make the  
6 digestate.

7 MS. OAKLEY: Because of the large  
8 quantities of manure that are required when it's  
9 a manure feedstock, that would typically be a  
10 confined animal feeding operation. But that is  
11 not necessarily a criteria that we can look at  
12 because there are composts and raw manure  
13 applications that take place using manure from  
14 those sources as well.

15 So concerns about that are legitimate  
16 but not necessarily ones we can use in this  
17 deliberation.

18 Harriet?

19 MS. BEHAR: So in our regulation we do  
20 have that if a product is a manure, it needs to  
21 go through a composting process, which we have a  
22 very detailed process of time and temperature

1 before it can be applied without the interval of  
2 90 or 120 days.

3 And so since this has some manure in  
4 it, I believe that we do have in our regulation  
5 that it doesn't meet because it doesn't have the  
6 time and the temperature. So it is not  
7 necessarily a pathogen-based but it really  
8 doesn't meet our regulation.

9 But on the other side, I believe there  
10 was at least one public comment, that there was  
11 an anaerobic digestate that was 100 percent plant  
12 based. Will you address that?

13 MS. OAKLEY: Yes, there was.  
14 Stahlbush Island Farms -- I'm not supposed to  
15 list the person -- has a food processing  
16 anaerobic digestate on their farm. It is a  
17 hydraulic digester which was not covered in this  
18 TR, which they pointed out in their comments and  
19 that they want us to evaluate anaerobic digestate  
20 processes and products individually.

21 Joelle, I don't know if you want to  
22 speak to that in terms of the pathogenic concern.

1 MS. MOSSO: Sure. I mean plant-based  
2 or manure-based, you still are dealing with food  
3 safety concerns. That's why we see outbreaks  
4 associated with non-animal based product.

5 So certainly listeria, salmonella,  
6 Campylobacter, these are all organisms that are  
7 known to have presence in plant material. So I  
8 don't think that that is a substantiation as to  
9 why it should be handled differently. But  
10 certainly it is still allowed to be used in  
11 organics. It's just still subject to the  
12 application intervals.

13 And again, reiterating is that if it  
14 came in complement with letters that said it  
15 could be appropriate to be used from a food  
16 safety concern, from the EPA, or FDA, or  
17 appropriate body, I think that would be a very  
18 different discussion.

19 I would also like to add is that  
20 currently FSMA and the FDA are undergoing review  
21 of the composting regulation that is in the  
22 National Organic Program regulations.

1                   So I think it just reiterates the  
2 point that it is not within our purview or  
3 expertise as a civilian board to be justifying  
4 what is food safe and not food safe for our  
5 program.

6                   MS. OAKLEY: I'm going to follow up  
7 and then Harriet.

8                   There were a number of public comments  
9 who were in support of our proposal for the  
10 reasons stated there. As I said earlier there  
11 were some public commenters who wanted us to look  
12 at these individually but, as Joelle has stated,  
13 I think that while that is beyond our purview as  
14 to whether or not they petitioned the NOP, we are  
15 going to be coming back to the same issues again  
16 and again because there is no conclusive evidence  
17 to show us that they are in fact safe.

18                   Harriet.

19                   MS. BEHAR: So the NOP also has a  
20 guidance document on the use of processed manure,  
21 which ties it to temperature and also to testing.  
22 So that could be something else that is discussed

1 or added to where there is a testing on E. coli  
2 and salmonella for processed, heated manure. And  
3 then that manure can be applied like compost up  
4 until day of harvest.

5 MS. OAKLEY: Joelle.

6 MS. MOSSO: Just a quick comment on  
7 testing. Testing in isolation is a verification  
8 method of a process. Associated with a  
9 validation, it can be reflective of something  
10 being safe.

11 So again, I am just reiterating is  
12 that with a process authority letter or with a  
13 FDA letter, that would be appropriate. Testing  
14 would be a sufficient way to prove food safety.  
15 In absence of that it is simply a verification  
16 method, just as it is in producing of food or of  
17 agricultural crop.

18 MS. OAKLEY: Harriet?

19 MS. BEHAR: I was just trying to find  
20 other places where we've tried to deal with this,  
21 this kind of issue. So we have some tools in the  
22 toolbox for looking at it and precedent for

1 making sure that the product that is being placed  
2 up until day of harvest is not going to  
3 contaminate the food with pathogens.

4 And actually that is a big deal in  
5 many places because sometimes organic can be seen  
6 negatively in the press. All they can use is  
7 manure and they don't have to say well wait a  
8 minute, we have a rule for manure. It can't be  
9 put on the crop without an interval and that we  
10 are looking at that. Whereas, in conventional  
11 agriculture, there is no oversight there on the  
12 use of manure.

13 So I think we do have something that  
14 we are working with, even if it is not part of  
15 the FDA -- you know we are not under FDA.

16 MS. OAKLEY: Sue -- and I did get the  
17 roll the finger look from Tom to hurry up  
18 conversation.

19 MS. BAIRD: Well, I was looking at the  
20 rule and it does say the producer must manage  
21 plant and animal materials that would not  
22 contaminate through any kind of prohibited

1 substance or residues or pathogenic organisms.

2 So even though the argument might be  
3 that there would be anaerobic digests that would  
4 be from plant materials, they would still have to  
5 verify there is no pathogenic organisms.

6 And then of course -- I've lost it. I  
7 lost it. Yes, three says un-composted plant  
8 materials. So again, even though it could be  
9 plant materials, it definitely states that it has  
10 to be able to prove to not have pathogenic  
11 organisms in the rule itself.

12 MS. OAKLEY: Tom, do you want us to  
13 wrap up the conversation?

14 DR. THICKE: I just want to thank you  
15 all for a good discussion here and Emily for a  
16 good, thorough review.

17 MS. OAKLEY: Thank you to the  
18 Technical Review. That was awesome.

19 Any other conversation, discussion  
20 before we vote? Okay, Tom.

21 MR. CHAPMAN: Okay, so the first  
22 motion before us is a classification motion. The

1 motion is to classify anaerobic digestate  
2 produced from nonsynthetic feedstocks as  
3 nonsynthetic.

4 The motion was made by Emily and  
5 seconded by Harriet. So this is, again, just to  
6 determine whether the material is synthetic or  
7 not synthetic. This motion is to determine it as  
8 nonsynthetic as listed here. A yes vote is to  
9 confirm that. A no vote is to reject that.

10 The voting starts with Dave.

11 MR. MORTENSEN: Yes.

12 MR. BUIE: Yes.

13 MS. SWAFFAR: Yes.

14 DR. SEITZ: Yes.

15 MR. RICE: Yes.

16 MS. BAIRD: Yes.

17 MS. BEHAR: Yes.

18 MS. OAKLEY: Yes.

19 DR. THICKE: Yes.

20 MS. BRIONES: Yes.

21 MS. DE LIMA: Yes.

22 MR. BRADMAN: Yes.

1 MS. MOSSO: Yes.

2 MR. ELA: Yes.

3 MR. CHAPMAN: The chair votes yes.

4 Fifteen yes, zero no. The motion  
5 passes.

6 The next motion, which disappeared  
7 from the sheet because we're on copper sulfate  
8 now.

9 The next motion is to amend Section  
10 205.203(c) Soil fertility and crop nutrient  
11 management practice standard, section (1) to add  
12 the words or undergo an anaerobic digestion  
13 process to the raw materials section; and to add  
14 section (4) which reads: Anaerobic digestion  
15 products that have been processed to reduce  
16 pathogens.

17 So, in essence, this motion is to  
18 allow anaerobic digestate without the withholding  
19 period. So a yes vote is to approve that; a no  
20 vote is to fail that.

21 Can someone scroll to the motion? The  
22 motion was made by Emily and seconded by Steve.

1 And the voting will start with Jesse.

2 MR. BUIE: No.

3 MS. SWAFFAR: No.

4 DR. SEITZ: No.

5 MR. RICE: No.

6 MS. BAIRD: No.

7 MS. BEHAR: No.

8 MS. OAKLEY: No.

9 DR. THICKE: No.

10 MS. BRIONES: No.

11 MS. DE LIMA: No.

12 MR. BRADMAN: No.

13 MS. MOSSO: No.

14 MR. ELA: No.

15 MR. MORTENSEN: No.

16 MR. CHAPMAN: The chair votes no.

17 Zero yes, 15 no. The motion fails.

18 All right, it is 4:15. We are going  
19 to take a ten-minute break. So be back at 4:25  
20 sharply and we will start on our other agenda  
21 items.

22 As you notice, we are running

1 significantly behind schedule. So we will most  
2 likely be delaying the CACS Subcommittee agenda  
3 to tomorrow. It will be the first item on the  
4 agenda tomorrow and we will start back up after  
5 the break with Crops again.

6 (Whereupon, the above-entitled matter  
7 went off the record at 4:15 p.m. and resumed at  
8 4:29 p.m.)

9 MR. CHAPMAN: All right. If Board  
10 members can return to their seats, we will get  
11 started. We have a quorum, so we'll come back  
12 into order and, Francis, back to you.

13 DR. THICKE: Okay. We're going to  
14 begin with -- Emily has a little loose end to  
15 wrap up in the last one.

16 MS. OAKLEY: Are you guys going to be  
17 quiet out there?

18 MR. CHAPMAN: If members of the public  
19 could please take their conversations outside,  
20 that would be greatly appreciated. If members of  
21 the public could please take their conversations  
22 outside, that would be appreciated. Thank you.

1 Emily?

2 MS. OAKLEY: Yes. I just wanted to  
3 follow up because I meant to answer something  
4 with Dan's point regarding the manure feedstock  
5 for anaerobic digesting and whether it might come  
6 from CAFOs. I also wanted to clarify that, as I  
7 said, that can be of a concern and is of a  
8 concern to me. And we do have the contaminated  
9 inputs as something that we are looking at on the  
10 work agenda.

11 So that's all I wanted to say. Thank  
12 you.

13 DR. THICKE: Thank you, Emily. So  
14 next up we have strengthening organic seed  
15 guidance, and Harriet is the lead.

16 MS. BEHAR: Well, first, I want to say  
17 thank you to everyone that gave comments. There  
18 were numerous certifiers, including the  
19 Accredited Certifier Association, ACA. Numerous  
20 public interest groups, including NOC, OTA, and  
21 the Organic Seed Alliance, and numerous farmers  
22 that gave thoughtful and detailed comments; areas

1 where improvements were requested, including the  
2 wording around trialing varieties to determine if  
3 they are of equivalent variety, to make sure that  
4 the trialing was not mandatory but the  
5 documentation of the trialing would be mandatory  
6 if it were to be done.

7 Many did not like the additional  
8 recordkeeping to track the search for organic  
9 seed for each specific nonorganic seed used on  
10 the farm. Many also commented that clarity or  
11 examples should be provided for what is an  
12 improvement for year-to-year on the use of  
13 organic seed. Increased use of seed suppliers,  
14 more varieties of organic seed used, more acres  
15 planted with organic seed, et cetera, were  
16 suggested.

17 Many also did not feel that reaching  
18 full compliance with use of 100 percent organic  
19 seed was realistic and felt it could lessen  
20 innovation and production on organic farms. The  
21 attention of this requirement was not to ignore  
22 the allowance for use of nonorganic seed when a

1 seed of the requested or required quality,  
2 quantity, or variety was not available, including  
3 regionally adapted seeds, which was also brought  
4 up. So perhaps we do need to do some  
5 wordsmithing for more clarity.

6 Some also did not like the increased  
7 number of sources used for searching for organic  
8 seed from three to five. And for a variety of  
9 reasons, although others supported this change,  
10 improvements were suggested by numerous  
11 commenters. Many comments were also received  
12 concerning the extra scrutiny required of what  
13 seed is at risk of genetic contamination, would  
14 testing be required, who would pay, and perhaps  
15 we should wait for the seed purity proposal to be  
16 completed before we address this issue in this  
17 strengthening seed guidance document.

18 There was also questions about, would  
19 there be an allowed tolerance level for GMO  
20 presence. And just so everyone would know, the  
21 Crops Subcommittee is now referring to seed  
22 purity instead as genetic integrity because we

1 felt that that was really speaking more to the  
2 issue.

3 And for that reason, we could talk --  
4 but the Crops Subcommittee thought that there  
5 were enough substantive comments that we perhaps  
6 should take it back to subcommittee and not vote  
7 on this document today.

8 DR. THICKE: Are you making that a  
9 motion, to refer it?

10 MS. OAKLEY: I make the motion to send  
11 it back to subcommittee. And this time I mean  
12 it.

13 (Laughter.)

14 DR. THICKE: I'll second it. Any  
15 discussion on that?

16 MR. CHAPMAN: Is there a second?

17 DR. THICKE: I did.

18 MR. CHAPMAN: Sorry. Francis. Okay.  
19 Steve?

20 MR. ELA: I would be in favor of  
21 sending it back. I think from what I've read  
22 we've got 95 percent of the document, but there

1 are some -- this is a really important topic, and  
2 I would like to see us get it right and  
3 consistent with what certifiers and farmers want.

4 And I think there is more that -- the  
5 little changes, while being small, are actually  
6 critical and we need to look at them and give a  
7 chance for more comment. So I would be in favor  
8 of sending it back and tweaking it just a little  
9 bit more.

10 DR. THICKE: Ashley?

11 MS. SWAFFAR: Yes. I think this is  
12 really one of the most critical documents that  
13 has come -- well, besides the other big one that  
14 -- one of the most critical documents affecting  
15 all sides of producers. And, you know, nothing  
16 makes me madder than showing up and doing a farm  
17 inspection and seeing them try to get by with a  
18 halfway-done seed search. And, you know, I think  
19 if we can strengthen this, it only makes the  
20 whole supply chain stronger. So --

21 DR. THICKE: Sue?

22 MS. BAIRD: Yes, I agree with that. I

1 do a lot of inspections in my 22 years of  
2 inspections, and I cringe a lot of times with the  
3 lack of -- the appearance of lack of effort to  
4 use organic seed, so I applaud the efforts.

5 As I did during the discussion, I am a  
6 little concerned about four-one-three, which  
7 points out contamination from non-GMO  
8 consideration, that we could use -- non-organic  
9 seed can be used if organic seeds cannot be  
10 sourced because of GMO contamination.

11 I think that that portrays a bad  
12 impression that our organic seeds would be  
13 contaminated and the nonorganic seeds might not  
14 be contaminated. I would like to have a little  
15 further discussion on that particular phrase  
16 within this document.

17 DR. THICKE: Unfortunately, that may  
18 be the case sometimes.

19 MS. BAIRD: Yes. That's possible, but  
20 I just -- it bothers me.

21 DR. THICKE: Anybody else? I guess  
22 we're ready to vote.

1           MR. CHAPMAN: All right. We'll move  
2 to a vote. The motion is to refer this proposal  
3 back to subcommittee. This is not a motion to  
4 conduct business, and so it follows Robert's  
5 Rules of Order, which would be a simple majority,  
6 so eight votes.

7           The motion was made by Harriet and  
8 seconded by Francis, and the voting will start  
9 with Ashley. A yes vote is to send it back to  
10 subcommittee.

11           MS. SWAFFAR: Yes.

12           DR. SEITZ: Yes.

13           MR. RICE: Yes.

14           MS. BAIRD: Yes.

15           MS. BEHAR: Yes.

16           MS. OAKLEY: Yes.

17           DR. THICKE: Yes.

18           MS. BRIONES: Yes.

19           MS. DE LIMA: Yes.

20           MR. BRADMAN: Yes.

21           MS. MOSSO: Yes.

22           MR. ELA: Yes.

1 MR. MORTENSEN: Yes.

2 MR. BUIE: Yes.

3 MR. CHAPMAN: The Chair votes yes.  
4 Fifteen yes, zero no; the motion passes. And I  
5 think that's it for the day. Is that right,  
6 Francis?

7 (Laughter.)

8 DR. THICKE: One little easy one left.

9 MR. CHAPMAN: Oh, okay. Back to you,  
10 then.

11 DR. THICKE: Okay. Michelle, did you  
12 have the PowerPoint for that?

13 Okay. Next up is the proposal,  
14 hydroponics and container growing. And we have  
15 in this -- the main part of the proposal is the  
16 majority view, and then we also have a minority  
17 view. So what we're planning to do is I'm going  
18 to summarize the majority view, Joelle will  
19 summarize the minority view, and Harriet will  
20 summarize comments, and then we're going to have  
21 a round robin where everybody can -- we'll go  
22 around in a circle.

1           Everybody can have a few minutes to  
2           express their opinion on what we have been  
3           talking about, and then after that we can follow  
4           it up with further discussion.

5           So we have our slides here. As I  
6           mentioned, we have a minority and a majority, and  
7           I think I have that -- yes, here we go. It  
8           works.

9           So I wanted to review a little bit of  
10          the history. 2010 NOSB recommendation, people  
11          have quoted that extensively. It was called  
12          Production Standards for Terrestrial Plants in  
13          Containers and Enclosures (Greenhouses). That is  
14          what was -- kind of started this process. And  
15          based on that, the NOP told us we needed more  
16          refinement of that.

17          So the next step that came up is in  
18          the fall of 2016, the Crops Subcommittee put  
19          forth a proposal on hydroponics, aquaponics, and  
20          bioponics, and after we discussed it at the  
21          meeting we have sent it back for further  
22          consideration to the committee.

1                   And then in the spring we came forward  
2 with a discussion document. It's not often we go  
3 from a proposal to a discussion document, but we  
4 went kind of backwards there. And now we are  
5 bringing forward the proposal based upon all of  
6 these discussions. And part of that process, the  
7 NOP asked -- put together a Hydroponic and  
8 Aquaponic Task Force, which reported in July of  
9 2016.

10                   And it was -- as you heard, it was  
11 contentious, and it split up basically into two  
12 committees, and a third one on labeling. But the  
13 one committee, the quote "pro soils," was --  
14 called themselves the 2010 Recommendations  
15 Subcommittee, and the other one called themselves  
16 the Hydroponic and Aquaponic Subcommittee. And  
17 then, again, there was the Alternative Labeling  
18 Subcommittee.

19                   And the NOP told the NOSB, "Take this  
20 task force and report the report to make a  
21 recommendation to AMS. Based upon your  
22 recommendation, AMS will take the necessary steps

1 to establish clear standards for these production  
2 systems. The public will be invited to provide  
3 comments during your deliberations as well as  
4 when AMS develops guidance or initiates  
5 rulemaking on this issue."

6 So the first committee, then, of that  
7 task force had several I'm calling here  
8 suggestions. Apparently, they were technically  
9 recommendations, but they were de facto  
10 recommendations of the subcommittee. And the  
11 first one was that systems of crop production  
12 that eliminate soil from the system, such as  
13 hydroponics, cannot be considered as acceptable  
14 farming practices. So their first stance was  
15 that all organic farming should be in the soil,  
16 without containers. The same as -- that's  
17 actually the same wording as came from the 2010  
18 NOSB recommendation.

19 They said if you cannot -- oh, I guess  
20 I got ahead of myself. To limit organic  
21 certification to what is grown in the ground,  
22 with the exception of transplants, ornamentals,

1 and herbs.

2           If containers are allowed, kind of  
3 their backup, limitation of no more than  
4 50 percent of the required fertility being added  
5 after planting, and no more than 20 percent to be  
6 added as a liquid fertilizer after planting. For  
7 perennials, these limitations should be on an  
8 annual basis.

9           Okay. And then there was the report  
10 of the Hydroponic and Aquaponic Subcommittee of  
11 the task force, and they didn't have a summary.  
12 I took everything on the first slide from the  
13 summary of the other committee. This one here, I  
14 pulled out what I could see as their  
15 representation of their -- kind of the essence of  
16 what they were saying, that organic hydroponic  
17 systems, a form of bioponics, contains  
18 substantial soil biology, including large numbers  
19 of bacteria, fungi, protozoa, and nematodes found  
20 in soil.

21           Secondly, they said farming is by  
22 nature site-specific, and the grower must be able

1 to uniquely adapt to his/her environmental  
2 constraints/resources. And then I kind of  
3 summarized it in the last bullet that they were  
4 advocating for hydroponic systems with adequate  
5 biology should be allowed to be certified  
6 organic.

7 So the Crops Subcommittee, with a lot  
8 of discussion, came up with -- well, with several  
9 iterations, as you saw, proposals and discussion  
10 documents. What we came up in this proposal is,  
11 first of all, aeroponics defined as a variation  
12 of hydroponic plant production in which plant  
13 roots are suspended in air and misted with  
14 nutrient solution.

15 And the motion in this proposal is to  
16 prohibit aeroponic production systems from  
17 organic certification, which we will revisit of  
18 course when it is time to vote.

19 Aquaponics, defined as a recirculating  
20 hydroponic plant production system in which  
21 plants are grown in nutrients originating from  
22 aquatic animal water waste, which may include the

1 use of bacteria to improve the availability of  
2 these nutrients to the plants.

3 The plants improve the water quality  
4 by using the nutrients and the water is then  
5 recirculated back to the aquatic animals.

6 And in the proposal, the majority  
7 view, we have a motion. I've got to look here.  
8 I can't see it. It's too little. Motion to  
9 prohibit aquaponic production systems from  
10 organic certification.

11 And then we get to a little more  
12 contentious area, and container production. We  
13 kind of defined it in the motion, what we thought  
14 was acceptable or what we would recommend.  
15 Motion that for container production be certified  
16 organic, a limit of 20 percent of the plant's  
17 nitrogen requirement can be supplied by liquid  
18 feeding, and a limit of 50 percent of the plant's  
19 nitrogen requirement can be added to the  
20 container after the crop has been planted.

21 For perennials, the nitrogen feeding  
22 limit is calculated on an annual basis.

1 Transplants, ornamentals, herbs, sprouts, fodder,  
2 and aquatic plants are exempted from these  
3 requirements. So you can see here, compared to  
4 the task force recommendation, we focused on  
5 nitrogen. They said basically all nutrients, 20  
6 percent liquid feeding of all nutrients, 50  
7 percent of all nutrients applied before the  
8 plants are -- the crops are planted.

9 The reason we went to just nitrogen is  
10 that nitrogen is really an indication I think of  
11 the way the system is operating. Nitrogen is  
12 normally one of the hardest elements to make --  
13 nutrients to make work in your system. And if  
14 you can make nitrogen work, you probably can make  
15 all of the other nutrient cycle as well.

16 Furthermore, it is easier under just  
17 one element that you have to monitor, easier for  
18 monitoring, easier for inspectors and everything  
19 like that.

20 And, let's see, okay. So how do you  
21 calculate that? People have asked. Well, you  
22 have this requirement for 20 percent of the

1 plant's nitrogen requirement being supplied by  
2 liquid feeding, and 50 percent nitrogen  
3 requirement can be added after the crop is  
4 planted. And basically if you search around the  
5 internet -- and this is a common reference, the  
6 Knott's Handbook for Vegetable Growers -- you can  
7 find information, based on research, on what the  
8 requirements are of various crops for various  
9 nutrients.

10 For example, this one here has a table  
11 on the accumulation of nutrients by vegetable  
12 crops for tomatoes. It is based on yield, a  
13 yield of 30-ton per acre. The fruit will  
14 accumulate 100 pounds per acre of nitrogen. The  
15 vines will accumulate 80 pounds, and the total is  
16 180.

17 So I see this as quite similar to the  
18 grazing requirement. As a dairy farmer, I have  
19 to prove that I am providing over 30 percent of  
20 my forage, my dry matter intake for the cows from  
21 pasture. And, of course, I get up to about 80  
22 percent, so it's not a problem for me.

1           But basically the way you do it is you  
2           take some assumptions like, what is the average  
3           weight of your cow? And for me it's about 1,000  
4           pounds for a jersey. And the dry matter intake  
5           is about three percent, so that's 30 pounds of  
6           dry matter a day. And then I subtract out how  
7           much grain they would get and how much hay they  
8           might eat, and the rest is grass.

9           And so this is very similar. We have  
10          the nutrient requirement, the nitrogen  
11          requirement for a crop, and so we can just  
12          basically take 20 and 50 percent of that and  
13          those are what we use. And there are other  
14          sources of this information. Many universities  
15          put out data on nitrogen uptake or nutrient  
16          uptakes of crops.

17          So we had a lot of objections, and the  
18          reason I'm going to put this up is that we have  
19          objections by some hydroponic growers that, well  
20          you can't do that. You can't put all of that on  
21          at one time, or you're going to have a problem.  
22          You're going to -- it's going to be toxic to the

1 plant or you're going to lose it all to leaching.

2           And one of the growers that did that  
3 -- somebody sent me some slides of it, and it's  
4 really an elegant system here. If you look at  
5 it, you can see this is what the root ball is,  
6 and this is what the substrate is. And so you  
7 can see you can't put too many pounds of nitrogen  
8 in there in the beginning of the year.

9           So you can see that this system could  
10 not work in that way. And if you look at a  
11 system like this that's bigger, larger  
12 containers, but they also will tell us that it  
13 can't work, and the reason being is that -- what  
14 is being used for a substrate, because this is  
15 what -- as we heard, is the common substrate,  
16 coconut coir.

17           And you can imagine this very porous  
18 material. It makes a great rooting medium, but  
19 if you pour in so much nitrogen it is going to be  
20 very available and it is going to leach away, and  
21 so on.

22           Now, if you compare that to a soil,

1        what is the difference?  Some are indicating  
2        maybe there is no difference.  But if you look at  
3        a soil and look at it from this perspective.  
4        This is a pie graph of what is in a soil, and  
5        often we have heard about the biological activity  
6        in the soil.

7                    If you look at this pie graph of the  
8        total biomass of the organic matter in the soil,  
9        just a small portion is the living organisms, the  
10       fungi, the bacteria, protozoa, and so on.  And  
11       then there is a whole range of different kinds of  
12       material in there, from very fresh residue that  
13       will break down quickly, to material that has  
14       been decomposing and some of it is getting more  
15       and more recalcitrant or more -- less resistant  
16       to breakdown.

17                    And then you have the humus, which is  
18       -- it still does break down, but it's more  
19       resistant.  And so there is the whole range of  
20       materials.  Some will break down and release  
21       nitrogen quickly, some more slowly, some more  
22       slowly and more slowly.  So that way -- that's

1 the way soil works, of course, and it can release  
2 enough nutrients for a whole season.

3 And if we take this a step further and  
4 look at a pie chart of the whole soil, that whole  
5 last pie chart fits in this little sliver here,  
6 organic matter, which can be -- five percent is  
7 pretty good. One to five or maybe more is a  
8 small portion of that whole soil, and the mineral  
9 matter comprises quite a big fraction. And the  
10 organic matter is intertwined intimately with  
11 that soil mineral fraction. And so that's all  
12 the habitat for those microorganisms.

13 And if we -- this is some data from  
14 Iowa State University -- is that a good soil will  
15 have like 10,000 pounds per acre of nitrogen in  
16 the organic pool. That is a pretty -- to think  
17 about that, compared to a pot with coir in it,  
18 that is a whole different system.

19 And what happens -- this was -- this  
20 slide was put together by some friends at Iowa  
21 State for water quality. This is below -- the  
22 brown part below -- this is below ground, the

1 corn plant there. And this shows how much  
2 nitrate leaches out of the system, but ignore  
3 that.

4 But the thing that you can look at is  
5 that there is constant biological cycling. And  
6 the problem here with, of course, corn is that it  
7 only has live roots in the soil for about five  
8 months of the year. Most of the year there are  
9 no live roots, so the nitrate will escape. But  
10 if you think of a plant with roots year-round or  
11 for the full duration, it cycles back and forth.  
12 This organic matter is constantly mineralizing  
13 nitrate out of the system to mineral form, and it  
14 is putting some back into the organic form. It  
15 is going around and around, and the plant is  
16 intimately connected with that process.

17 And so you can see how if you have a  
18 soil or a compost that has that ability to  
19 deliver nutrients over a long time, it has to be  
20 a whole different system than an artificial kind  
21 of system like coir.

22 So I'm going to -- this is the

1 hydroponic motion. It is very closely related to  
2 the motion for containers. The motion is that  
3 any container production system that does not  
4 meet the standard of a limit of 20 percent of the  
5 plant's nitrogen requirement being supplied by  
6 liquid feeding, and a limit of 50 percent of the  
7 plant's nitrogen requirement being added to the  
8 container after the crop has been planted, is  
9 defined as hydroponic and should not be allowed  
10 to be certified organic.

11 For perennials, the nitrogen feeding  
12 limit is calculated on an annual basis.  
13 Transplants, ornamentals, herbs, sprouts, fodder,  
14 and aquatic plants are exempted from these  
15 requirements.

16 I think I'm going to stop right there.  
17 I don't know if anybody has any burning  
18 questions. Otherwise, we can go on to the  
19 minority report.

20 MS. MOSSO: Just waiting for the  
21 slides. Okay. Since I don't have a clicker,  
22 I'll just -- oh, perfect.

1           Okay. So, first, I'd like to thank  
2           everybody for the opportunity to present the  
3           minority view to the public as well as to the  
4           board. I also wanted to call out on behalf of  
5           all of the people who contributed to the minority  
6           report that we had a very respectful discussion  
7           amongst the board, and I think we would  
8           appreciate it and hope to have that same sort of  
9           discussion in our community.

10           The organic community is one community  
11           and it is with our inclusiveness over these last  
12           many years that we have led to compromise and  
13           have generated the robust market that we see  
14           today.

15           I would also like to say both Francis'  
16           and my summary of the minority view and the  
17           majority view are over kind of top level, so  
18           please do take the time to read them in their  
19           entirety.

20           The minority view is a reflection of  
21           the diversity of the NOSB board and a subset of  
22           the board that has put forth the minority view.

1 It is also a reflection of the organic community  
2 and the different opinions that we see with our  
3 own community or diversity within our own  
4 community.

5 This has been evident from the NOP  
6 comments regarding the allowance of hydroponic  
7 that we have seen in discussion since as early as  
8 2002, 2004, 2009, 2014, and 2016. In addition,  
9 as we have seen today in this meeting and prior  
10 meetings, we have obviously seen a distribution  
11 of public comments and support, as well as NOSB  
12 discussion of support, so with some members being  
13 for and some being against.

14 In addition, pro-hydroponic proponents  
15 within the hydroponic task force, obviously, that  
16 report, as has been discussed previously, is a  
17 bifurcated report that has support on both sides.  
18 Hydroponic and container systems are members that  
19 are already in our community. I think that's  
20 important to emphasize, is that we are not asking  
21 for the inclusion of those who have been excluded  
22 but the exclusion of those who have been

1 included.

2 This has brought more organic  
3 consumers to the organic table and has helped us  
4 grow the market to where it stands today. And  
5 amongst those organic producers, just as we see  
6 in in-soil or in any other producers, there is a  
7 continuum of methods and, importantly, consumers  
8 buy organic for numerous reasons.

9 Organic is equally important to all of  
10 them who buy organic products, and the impetus as  
11 to why they buy them is also important. Not to  
12 say one is more important than the other.  
13 Coexistence of soil and non-soil-based systems is  
14 possible, and the minority view would like to  
15 emphasize that supporting non-soil-based systems  
16 is not a mutually exclusive decision.

17 As such, we would hope and respect  
18 that the community would also hope and respect in  
19 that kind of regard. These are not to kick out  
20 one or the other, although sometimes it may feel  
21 like that way.

22 Just as we see a spectrum of soil-

1 based systems, we also see a spectrum of  
2 alternative methods. And we will go to the next  
3 slide.

4 As Francis noted, the NOP recently  
5 asked for further clarification on the 2010 NOSB  
6 recommendation entitled Production Standards for  
7 Terrestrial Plants in Containers and Enclosures  
8 to be able to implement the regulation in regards  
9 to hydroponic and container systems.

10 This minority view is a redlined,  
11 further clarified version of the 2010 NOSB  
12 recommendation. In order to produce this, the  
13 minority view group, based upon these  
14 recommendations or minority opinions that enforce  
15 responsible stewardship practices, address  
16 sustainability and conservation of resources,  
17 allow for innovation and production systems,  
18 which will ultimately increase access to organic  
19 food, be regulated and defined by a verifiable  
20 standard addressing the biological/ecological  
21 cycles in site-specific regions.

22 This is building upon the foundation

1 left by prior NOSB members and is an attempt to  
2 further elucidate the needs of the NOP and the  
3 organic community to reflect not just current  
4 producers but current and future consumers that  
5 will propagate our market even more in the  
6 future. It is with this consideration that the  
7 minority view has crafted additional language.

8 Non-soil-based systems -- in  
9 discussion, the minority view agreed upon that  
10 they can address unique and growing agronomic  
11 challenges that we have seen in public comment as  
12 well as just evident in day-to-day operations,  
13 some of which being drought. Coming from  
14 California, that is something we struggle with  
15 significantly.

16 Input minimization, fertilizers,  
17 pesticides, and herbicides, further reducing the  
18 reliance on inputs that are needed to travel far  
19 distances in some cases to production sites; food  
20 safety concerns, which may or may not be unique,  
21 or eliminated in some cases in these unique  
22 systems; and, importantly, the ability to address

1 arable land accessibility with special callouts  
2 to urban areas and areas of non-arable soil,  
3 further allowing for access to organic foods for  
4 more in our community.

5 In the 2010 recommendation that  
6 allowed compost to be utilized in place of soil  
7 because it was deemed equivalent to soil. The  
8 foundation of this equivalency was stated as  
9 follows. The foundational principle of organic  
10 farming is the practice of maintaining and  
11 nurturing soil health, so as to foster the  
12 proliferation of proper soil biology with their  
13 accompanying ecologies. Since all soil-dwelling  
14 organisms, such as earthworms, protozoa, fungi,  
15 bacteria, actinomyocetes can thrive in a properly  
16 composted -- properly designed, compost-based  
17 growing media producing the beneficial symbiotic  
18 ecological relationships found in soil. Such  
19 growing media should be rightfully considered  
20 soil.

21 However, obviously, as NOP asked upon  
22 the NOSB, further clarification was needed on how

1 to address ecology in these non-soil-based  
2 systems. The minority view has introduced a new  
3 concept in which we have asked the public at this  
4 meeting for comment, of which little was  
5 received.

6 But trophic levels as an introduction  
7 in attempts to find a compliant, organic,  
8 systems-based level that can give something that  
9 is physically verified and address an equal  
10 playing ground across all organic systems,  
11 focusing not just on microbial activity but on  
12 microbial ecology.

13 The trophic levels definition that has  
14 been introduced in this minority view is a  
15 hierarchical level of organisms within an  
16 ecosystem, each level consisting of organisms  
17 that share the same function and food source in  
18 the food chain of a defined ecosystem.

19 Examples of this would be Level 1  
20 would be photosynthesizers, including plants,  
21 lichen, moss, and some bacteria and algae.  
22 Bacteria and fungi in Level 2, which would be

1 photosynthesizer predators. Level 3, shredders,  
2 which would include, but not just only including,  
3 millipedes, sow bugs, some mites, grazers of  
4 bacteria and fungi. Level 4, higher level  
5 predators, predatory and omnivore nematodes and  
6 earthworms would be examples of Level 4.  
7 Level 5, vertebrates, frogs, snakes, birds, and  
8 fish.

9 For those of you who are more inclined  
10 to see pictures, I stole this from the NRCS here  
11 to help us describe this. It is simply a graphic  
12 representation of the levels that were just  
13 described with the first filing through the  
14 fourth.

15 Now for the fun stuff -- actual  
16 regulations I have introduced. As we -- as I  
17 introduced prior, this is a further defined and  
18 redlined version of the NOSB's 2010  
19 recommendation. So I will go through briefly  
20 trying to call out some of the significant  
21 changes.

22 Hydroponics. The definition largely

1 stayed the same. The production of normally  
2 terrestrial, vascular plants in nutrient-rich  
3 solutions or an inert, porous, solid matrix  
4 bathed in nutrient-rich solutions. The addition  
5 has been in regards to sprouts and fodder and are  
6 considered a processed material and not  
7 considered hydroponics.

8 Container production has been  
9 introduced with a definition. The production of  
10 normally terrestrial, vascular plants in  
11 containers. It can be certified organic if  
12 production requirements of Section 205.209 are  
13 met. And as I just described, trophic levels on  
14 the previous couple of slides.

15 Within this section, 205.105, you see  
16 the addition of aeroponics and hydroponics, which  
17 would be prohibited without organic being  
18 produced without the handle and use of aeroponics  
19 and hydroponics. The addition of 205.209,  
20 terrestrial plants in containers and enclosures,  
21 would further stipulate how our containers could  
22 be addressed within organic production.

1                   Container and enclosure operations  
2 must meet all applicable requirements of  
3 Subpart B, 205.105. We'll go through this  
4 quickly knowing the time.

5                   Producer operating a container and  
6 enclosure, operation with crops growing in  
7 containers using a growing media that does not  
8 include soil from the production site, is exempt  
9 from 205.202(b). And for those of you keeping  
10 track, that is the three-year timeframe from  
11 transition.

12                  Second, which is a new amendment to  
13 this minority proposal, the producer operating  
14 with crops grown in containers shall comply with  
15 the applicable section of 205.203(a), which is  
16 that has been managed in accordance to the soil  
17 infertility in crop standard, which is Sections  
18 205.203 to 206.

19                  Further, that container-based producer  
20 is exempt from crop rotation and cover cropping  
21 requirements. In lieu of this, however, they  
22 would have to focus on practices that achieved

1 the functions and goals of crop rotation and  
2 cover cropping, and there are some additional  
3 examples that we could do for that.

4 And maintain or improve soil organic  
5 matter content. Examples are including, but not  
6 limited to, recycling and reuse of growing media,  
7 additional of composts and other compostable  
8 materials, earthworm replenishment, and microbial  
9 reinoculation. Provide for pest management in  
10 crops, soil-borne damping off controls for  
11 various low temperature heating methods, soil  
12 inoculation, using disease-suppressant bacteria  
13 and fungi.

14 Manage deficient or excessive plant  
15 nutrients. Examples are limited -- include, but  
16 are not limited to, recycling of the excess plant  
17 nutrients contained in drain water and media  
18 containers, avoiding so-called drain-to-waste  
19 systems, recycled nutrients to be reused in a  
20 greenhouse, or, alternately, growing a crop  
21 outside the facility and to address erosion  
22 control, again, were the examples given.

1                   Four, the container organic system  
2 must address the requirements to conserve  
3 biodiversity and maintain or improve natural  
4 resources on the site-specific operations. The  
5 organic system plan should include the entire  
6 production site, containers and non-containers as  
7 applicable, as well as surrounding environment,  
8 growing media requirements.

9                   Relatively few changes to the 2010;  
10 however, there is, as you can see, the  
11 introduction of the supporting of the four  
12 trophic levels, and the addition of growing media  
13 shall be a minimum of 50 percent carbon-based  
14 material.

15                   And, finally, the addition that  
16 producers must recycle or reuse containers at the  
17 end of life.

18                   These changes have been made to  
19 further clarify for the NOP how a standard may be  
20 met as well as providing the flexibility for  
21 innovative systems and organic production to  
22 continue to evolve.

1           In addition, some of the stipulations  
2           that have been added in the 2010 recommendation  
3           are specifically driving at recyclability,  
4           sustainability, and biodiversity, in the attempt  
5           that we can create a system that would be  
6           compatible and acceptable to address the concerns  
7           of many in the organic community and find  
8           compliant systems.

9           I will end there and open it up for  
10          discussion or public comment for Harriet.

11          MS. BEHAR: Can I ask a question?

12          DR. THICKE: Sure.

13          MS. BEHAR: So a hydroponic operation  
14          that would be in a warehouse, could that have the  
15          four trophic levels?

16          MS. MOSSO: As this is written, as  
17          long as it could meet the stipulations put here,  
18          it could be a compliance system.

19          MS. BEHAR: So they would have to  
20          bring snakes in or something or -- I'm trying to  
21          think about that fifth trophic level with the  
22          frogs. And, I mean, we're talking about an

1 indoor -- completely indoor space. I'm just  
2 trying to understand how they would be --

3 MS. MOSSO: It would have to be  
4 reflective of four trophic levels, yes.

5 MS. BEHAR: Okay.

6 MS. MOSSO: As written here.

7 MS. BEHAR: I have snakes in my  
8 greenhouse.

9 MR. CHAPMAN: I mean, as I understand  
10 it, they would need to meet the four trophic  
11 levels or they could not get certified organic.  
12 I mean, just like every other rule there is.

13 DR. THICKE: I have some questions  
14 about that, too, but I think we should do our  
15 round robin first, and then we can --

16 MS. BEHAR: Public comment.

17 DR. THICKE: A clarifying question?

18 MS. BEHAR: Public comment.

19 DR. THICKE: Public comment. Wait.  
20 Harriet.

21 MS. BEHAR: Okay. So I wanted to say,  
22 I don't know, I must have been naughty and they

1 gave me the job of summarizing these, but I  
2 really did appreciate all of the comments. It  
3 can be slightly overwhelming to have a  
4 controversial issue that we have to deal with,  
5 but it is also really part of our community to be  
6 passionate and want to be involved. And I find  
7 that, you know, kind of another hallmark of the  
8 organic community.

9           So both -- so I am going to kind of  
10 summarize each of the sites and then where they  
11 all converged. Current organic hydroponic and  
12 aquaponics operations want to retain their  
13 organic certification and passionately described  
14 how they meet organic rules and should be allowed  
15 to use the USDA organic seal.

16           Many comments were made of the food  
17 safety benefits of different types of ponics  
18 production, access to farming for beginning  
19 farmers of all types and ages, ability to grow  
20 anywhere, including urban areas, and providing  
21 healthy food with very low transport miles. Use  
22 of only organically approved inputs, mostly

1 fertility products, is the basis of their organic  
2 approval as well as the sustainability of their  
3 system.

4           There was discussion that there is  
5 less use of pesticides in these controlled  
6 environments compared to open-air, field-grown  
7 crops. Higher yields and year-round growing can  
8 be accomplished using this unique technology, and  
9 they felt that we should embrace this and not  
10 stifle innovation.

11           Some discussion was done on perhaps a  
12 label could better distinguish hydroponic from  
13 soil-grown in the marketplace. And, lastly,  
14 commenters made the argument that there is a need  
15 for more organic produce in the market, not less.

16           On the other side, the soil people  
17 stated that soil is the foundation of organic  
18 agriculture and that it is mandated in law and  
19 regulations in numerous places and numerous ways.  
20 Soil-based operations are also sustainable and  
21 offer greater ecosystem benefits. Hydroponics  
22 should promote their unique technologies with

1 their own label and not ride on the coattails of  
2 the organic label.

3 Foundational principles of organic  
4 production are tied to feed the soil and not the  
5 plant, as well as building continuous improvement  
6 with less and less reliance on outside purchased  
7 inputs. Numerous commenters commented on this  
8 reliance and a variety of reasons that that is  
9 not sustainable.

10 They did not have a difference -- no  
11 problem with having a different production  
12 system, but many felt very strongly it was not  
13 organic according to the Organic Food Production  
14 Act and the current regulations.

15 There is not just maintenance but  
16 improvement of natural resources in field and  
17 soil operations, and that is mandated in the  
18 organic rule. All commenters talked about what  
19 consumers want -- safe food, pesticide-free,  
20 local food, protection of the environment, long-  
21 term sustainability, and plants being fed through  
22 a biologically active system.

1           Some hydroponic container operators  
2           said they could change their system to meet the  
3           Crops Subcommittee recommendation, but most said  
4           they could or would not. Some soil-based farmers  
5           stated they could live with the Crops  
6           Subcommittee compromise, but some said they  
7           wanted crops growing in soil in the ground and  
8           not in containers.

9           They only gave me five minutes, so --

10           DR. THICKE: Thank you, Harriet. I  
11           warned Emily that she could be first, so why  
12           don't we go around and each take a few minutes to  
13           tell us what you think.

14           MS. OAKLEY: I feel so lucky to get to  
15           be first. No, I don't. I just did want to say  
16           that I feel like I have poured my heart out on  
17           this issue over the course of several meetings  
18           and on CS calls and hydroponic webinar. So there  
19           is not a whole lot more I can say that people  
20           haven't already heard. And just like others have  
21           said, this issue is so controversial because we  
22           are all debating our collective vision of organic

1 agriculture here. But I did again prepare  
2 comments that were written down, so that I would  
3 say exactly what I meant to say.

4 Yeah. This debate is about so much  
5 more than scale or geography, how big you grow or  
6 where you grow. And we have seen farmers growing  
7 large acreages and small acreages in the west and  
8 in the east and even in the middle, expressing  
9 their opposition to hydroponics.

10 But I feel as a smaller scale farmer  
11 myself I am here to really represent that voice  
12 on the board. And to that point, I often wonder  
13 like what is the breakdown of the number of USDA  
14 certified farms that fall within a range of acres  
15 grown.

16 So I asked the National Agricultural  
17 Statistics Service if they could give me that  
18 data. So from the 2016 organic survey, this is  
19 the first important statistic. 73 percent of all  
20 certified farms were under 180 acres. That is a  
21 big number. And if you want that broken down,  
22 that's 14,185 certified farms altogether. 22

1 percent grew under 10 acres; 23 percent grew  
2 between 10 and 49; 28 grew between 50 and 179.  
3 So taken together, again, that's 73 percent of  
4 all farms in 2016 growing under 180 acres.

5 Why is that important? It's just  
6 those numbers, because 73 percent is a  
7 significant number. It is a huge percentage of  
8 all certified organic farms in the United States.  
9 These smaller scale operations are not just a  
10 side note to the movement. They are the  
11 foundation of the certified organic label.

12 Meanwhile, in that same year, the NOP  
13 provided us with survey data that they collected,  
14 2016, that only less than .4 percent of all  
15 worldwide certified organic operations were  
16 hydroponic, aquaponic, or container-based  
17 combined. And that was 121 operations in total  
18 of the worldwide operations.

19 Small-scale organic farming is a labor  
20 of love, not one done for profits. But there are  
21 far easier ways to earn a living that family-  
22 scale farmers do that is out of a passionate

1 belief system and the value of organic farming,  
2 which you have heard from in the past couple of  
3 days.

4 I have yet to hear from a single  
5 small-scale farmer in support of hydroponics or  
6 containers. In fact, an organic vegetable farmer  
7 in my region who also has a small aquaponics  
8 operation told me that he did not believe his  
9 aquaponic system should or could be certified  
10 organic.

11 I know some are legitimately concerned  
12 about taking away certification from those who  
13 have already been certified, those aquaponics and  
14 hydroponic and container systems. But in my  
15 view, a far greater concern is that 73 percent of  
16 smaller scale farmers -- and I don't want them to  
17 begin to feel sufficiently disenfranchised from  
18 the label as to leave it, which I think is a very  
19 legitimate concern.

20 And that is not a concern as much just  
21 to the small-scale farmers. That is concern to  
22 the entire label, and the larger scale operations

1 because we are all operating under the integrity  
2 and understanding of this label.

3 Soil-based farmers have expressed  
4 their strong preference for organics in the soil,  
5 in the ground. And to be clear, that is my own  
6 preference and the one I feel obligated to  
7 represent as a stakeholder. So please be fully  
8 aware that my support of the CS motion on  
9 container growing is a monumental compromise for  
10 me, one which my stakeholder community will not  
11 support.

12 I ask my fellow board members to meet  
13 me in the middle and realize that that, too, will  
14 mean for them not fully representing everything  
15 that their stakeholders want. And I feel that  
16 this compromise position is our highest and best  
17 effort and closest chance we will ever get to  
18 that.

19 DR. THICKE: For the record, I should  
20 say Harriet is next. Somebody has got to  
21 transcribe all of this.

22 MS. BEHAR: Okay. So I have been an

1 organic inspector for a few decades. I have  
2 taught organic farming I can't tell you to how  
3 many, probably thousands of people over many  
4 workshops and field days and answering questions  
5 on the telephone.

6 And I feel I really have a connection  
7 with people who are organic farmers, who want to  
8 be organic farmers, but I really have a  
9 connection with the rule. I mean, when someone  
10 says, "Harriet, will you go teach the organic  
11 regulation" at this conference or at a field day,  
12 it's like Harriet can do this in her sleep.  
13 Literally. Sometimes I wonder, what did I just  
14 do? But I know I gave the organic regulation.

15 And so looking at hydroponic, I am  
16 seeing it through the Organic Food Production Act  
17 and through the organic regulation. And, really,  
18 the word "soil" is woven in there in so many  
19 places. And it's not just as a substrate; it's  
20 as the system that is feeding the plant and  
21 feeding the planet.

22 So I wanted to just show when you're

1 soil-based agriculture -- you really are  
2 integrated with a greater ecosystem, and I went  
3 through an organic system plan, and I put in,  
4 hopefully -- it's the upper -- hello.

5           So the things that have to be done by  
6 a soil-based farmer in the organic system plan.  
7 Well, they have to do crop rotation. They have  
8 to use cover crops. They have to manage use of  
9 animal manures protecting water quality and food  
10 safety from pathogens. They have to put in  
11 pollinator and beneficial insect habitat. This  
12 is all from an organic system plan where people  
13 have -- wildlife habitat, providing food and  
14 habitat for wildlife. And although many farmers  
15 don't like to think of their crops as food for  
16 wildlife, it is.

17           Hello. I'm hitting it. There we go.  
18 No. Maybe, Michelle, you want to hit it. Okay.

19           Approved organic pesticides. Next?  
20 Maybe you just hit them for me, so we don't --  
21 approved organic fertilizers and micronutrients.  
22 Next?

1                   Food safety planning. That's not  
2 necessarily required, but it is done. Next?

3                   Wildlife -- oh, I guess I had that  
4 twice. Okay. Next?

5                   That it's soil-based because that is  
6 part of the rule. Next?

7                   Compost is used. Next?

8                   Diverse and robust biological life.

9 Next?

10                  Monitoring of crop health. Next?

11                  Protection of ecosystem water quality.

12 Next?

13                  Minimize soil erosion. Next?

14                  Water conservation. Next?

15                  Protection of stream banks and

16 wetlands. Next?

17                  Use of organic and untreated seeds.

18 Next?

19                  Removal of plastics at the end of the  
20 season. Next?

21                  Bat houses and birdhouses and frog  
22 ponds, which I have all of those on my farm.

1 Next?

2 Less sprays along the roadways and  
3 under utility lines, and that just kind of shows  
4 even the greater ecosystem. And I know in my  
5 neighborhood the utility company, every few years  
6 they come and they have me resign my no-spray  
7 agreement with them, and they complain to me  
8 because I made the whole neighborhood a no-spray  
9 area.

10 Mitigation against pesticide spray  
11 drift and GMO drift. Next?

12 Integrate cultural, biological, and  
13 mechanical practices. Next?

14 Recycling of plant residues and on-  
15 farm-generated nutrients. Next?

16 Conserve and improve biodiversity.

17 Next?

18 Okay. So water-based agriculture can  
19 very easily be removed from the greater  
20 ecosystem. I don't know what's going on. You  
21 can do next.

22 And so there are things that are being

1 done that are on the organic system plan. Hit  
2 the button.

3 So approved organic pesticides. I  
4 agree, that's what they are -- so I just --  
5 similar to the soil-based. Next?

6 Approved organic fertilizers and  
7 micronutrients. Yeah, that's there. Food safety  
8 planning. Yep, that's done. Some biological  
9 life. Yeah, I would say that there is some  
10 there. I would say it's not as great as in the  
11 soil. Yes, they monitor crop health. Next?

12 There is water conservation. Yes.  
13 Next?

14 Use of organic and untreated seeds.  
15 Yep. Okay. Next?

16 Mitigation against pesticide spray  
17 drift and GMO drift. Yeah, that happens. So  
18 let's compare. So here is the two different  
19 systems, and so the activities that are being  
20 done on a field-grown, soil-based system just has  
21 so much more activity going on. It has so much  
22 more benefits, not just even on that farm but in

1 the greater area. And I know that on my farm I  
2 see that, you know, the fact that they're not  
3 spraying the roadsides literally for a few miles  
4 because I got all my neighbors to say, "Don't  
5 spray under the roads, lay it along the roads."

6 So I just -- I'm looking at this from  
7 the regulation, how much the soil-based farmers  
8 have to do under an organic system plan versus  
9 what is capable of a water-based system and what  
10 they are asked to do. I think there is just --  
11 the soil-based people deserve that organic label  
12 because they're working really hard.

13 And then the last slide is, while I  
14 was here, I got this over my email, that there is  
15 a lot of discussion about hydroponic being much  
16 safer for food, you know, has a better food  
17 safety. But I think we are basically equal  
18 there, that there can be outbreaks in a  
19 hydroponic operation.

20 This is in Illinois. It's an  
21 operation that produces over a million clamshells  
22 a year of greens, and they had a recall of E.

1 coli on October 27th.

2 So food safety planning, if you  
3 noticed, it was in both. So I don't say that one  
4 is better than the other. Both have to work at  
5 that.

6 So just in summary, I just -- I really  
7 feel that the organic regulation and the Organic  
8 Food Production Act fully support soil-based  
9 agriculture and does not support the label being  
10 put on operations that rely on outside inputs for  
11 all of their nutrition, liquid feeding.

12 DR. THICKE: Thank you, Harriet. Sue?

13 MS. BAIRD: I feel very -- I don't  
14 have all these pretty slides, so I'm just going  
15 to talk to you from my heart. I'm here to  
16 represent a public interest. I could almost  
17 duplicate Harriet's long history by a few years.

18 She actually was my mentor to become  
19 an organic inspector. I have inspected organic  
20 farms from all over the United States. I have  
21 taught organic inspection and organic  
22 certification in 18 states, in Mexico, in

1 Guatemala, in Peru, and in Egypt, and in England.

2 So I think that I know the regulation.

3 I have many dear friends in the soil world, and

4 I'm in the soil world. There's nothing I like

5 better than to take my shoes off when it gets

6 warm enough, and sometimes when it's not quite

7 warm enough, and walk in my garden barefoot in

8 the soil. I think there is something magical

9 about being in the soil.

10 But, and here is where you guys are

11 going to crucify me, I was in state government

12 for quite a long time, and I was taught when you

13 write a law or a regulation to implement the law

14 -- and I'm going to read this to you. It is an

15 1807 communication from Thomas Jefferson to

16 William H. Cabell concerning statutory

17 interpretation. And Thomas Jefferson stated, and

18 this is used through all kinds of laws and

19 regulations and what must be followed.

20 "In the construction of a law, even in

21 judiciary cases of" -- Richard, I don't know that

22 word -- M-E-U-M, E-T, T-U-U-M, Latin I did not

1 learn -- "where the opposite parties have a right  
2 and counter right, in the very words of the law,  
3 the judge considers the intention of the lawgiver  
4 as the true guide and gives to all the parts an  
5 expression of the law that meaning which will  
6 effect instead of defeating its intention." And  
7 it goes on and on. And that is what is used to  
8 interpret laws even to this day.

9 And so going back into the intent of  
10 the law, we find -- and I think Tom brought  
11 several of this up. But even in the 1995 NOSB  
12 recommendation standards for greenhouses it  
13 contained this statement. "Hydroponic production  
14 and soilless medium to be labeled organically  
15 produced shall be allowed if all provisions of  
16 OCPA have been met."

17 And, of course, it was pointed out by  
18 Sam Welch and others that of course OCPA had soil  
19 written into it many times, and I am cognizant of  
20 that.

21 In March of 2000, a revised proposed  
22 rule stated they revised the initial proposed

1 rule. In their supplemental information they  
2 stated, "We have amended the term system of  
3 organic farming and handling to system of organic  
4 production and handling, and retained the  
5 original definition of the proposal."

6 The original definition was crafted to  
7 be consistent with the requirements of the Act.  
8 We have changed "farming" to "production" to  
9 provide a more encompassing term which may come  
10 to include such diverse activities as  
11 hydroponics, greenhouse production, and  
12 harvesting of aquatic animals.

13 The purpose of the original definition  
14 was to describe practices and substances  
15 consistent with systems of organic farming and  
16 organic handling as required by the Act, and to  
17 provide an explicit reference point for  
18 determining which practices and substances are  
19 most consistent with these systems.

20 In other words, there was an intent  
21 from the very beginning that at some point we  
22 would address and encompass hydroponics systems,

1 and I can't go back on that. More than that, I  
2 am a mother and I am a grandmother and I am a  
3 concerned citizen.

4 I am a product of -- at least from  
5 1600 we traced our roots back to farming. I am a  
6 product of farmers. I am a farmer more than  
7 anything in the world. My members of MOA are  
8 farmers, and many of them will disagree with how,  
9 the position I am taking today. Some of them  
10 will agree.

11 So I'm here just to -- because, well,  
12 you can't please everybody. So I'm here to  
13 follow my heart, and my heart says land is  
14 disappearing. My people that have settled in  
15 northwest Arkansas in 1852, those people can no  
16 longer buy farms because -- I'm not going to use  
17 that D word that we use for the Yankees who have  
18 come down and bought all of our farms. Cannot  
19 farm -- buy farmland. They want to farm. They  
20 were raised for generations to be farmers. They  
21 can't find land. They want to raise food for  
22 their neighbors.

1           Last year we had a horrible incident  
2           in Missouri. Was it two years ago? I think it's  
3           still last year. Ferguson. Do you all remember  
4           Ferguson? Made national news. Urban young  
5           people are so disenfranchised. They don't have  
6           fresh food available. You can say, "Oh, well,  
7           you know, you can go to the grocery store," but  
8           many of these people don't have opportunities to  
9           go to the grocery store, and they need fresh  
10          food.

11           And there is no land. It's concrete.  
12          How do we supply those foods for the next  
13          generations? How do we do that? Well, yeah, we  
14          can establish community gardens, and we do that.  
15          But we have young people who have lost their  
16          hope. They can't afford tractors. They can't  
17          afford cultivators, and I don't know how that guy  
18          does 38,000 acres of certified organic vegetables  
19          because I sure couldn't do it. He must use a  
20          whole lot of help.

21           But I'm telling you, that little --  
22          can I say those minority people on those concrete

1 don't have that opportunity, and they need  
2 opportunity to farm food. So reading this and  
3 seeing that the intent was that someday we would  
4 allow hydroponics and aquaponics, and all the new  
5 stuff that happens to be labeled as organic, I am  
6 not inclined to limit organic labeling to just  
7 soil.

8 And I'm sorry to the pioneers who have  
9 done such wonderful, wonderful work, in the soil.  
10 I'll always be there with you. I'll always put  
11 my feet in the dirt first thing in the spring.  
12 But I have to say no.

13 DR. THICKE: Thank you. I think that  
14 we kind of agreed to three minutes sort of, but -  
15 - so that's okay. We'll just give everybody a  
16 chance. Thank you. Scott?

17 MR. RICE: Thanks. Like all of my  
18 fellow board members, I have given this quite a  
19 bit of thought and listened to, of course, a  
20 number of comments and read as many. You know, I  
21 have been somewhat frustrated with the either/or  
22 and the with or against, and that always kind of

1       saddens me a bit to see that split, because I  
2       don't see this as an either/or, for or against  
3       soil.

4                   I have had a long, great relationship  
5       with soil. I've farmed beautiful soil, I have  
6       farmed not-so-beautiful soil, and I have seen the  
7       reward of building that over a number of years  
8       and seen that -- seen the impact of that and have  
9       gained from that.

10                   And, you know, we've heard about  
11       people having a preference for one of the other.  
12       I think, you know, part of me will always have a  
13       preference to that soil. But I also like to keep  
14       an open mind to innovation and see that as really  
15       one of the greatest skills that growers bring to  
16       farming.

17                   And, you know, when I first got into  
18       this, into organic production and getting my  
19       hands dirty, I didn't really understand the  
20       attraction of hydroponics or soilless growing or  
21       container growing. But, you know, as I have  
22       learned more about these production systems and

1     seen them in action and visited them, I have seen  
2     some pretty amazing examples of it, including a  
3     recent visit to an operation that expressed quite  
4     a number of the benefits that Harriet shared with  
5     us and, you know, seeing them as being emphatic  
6     about building their -- building and feeding  
7     their soil and that media that they felt -- and  
8     their care of it with soil and the plants in it,  
9     with a significant focus on sourcing organic seed  
10    and moving in the direction of solely organic  
11    seed and moving those who supply them with seed  
12    to encourage organic seed trials.

13                   They are looking at seasonal  
14    production where they are not using any  
15    artificial light. They start early in the season  
16    and late, and then get beds ready for the next  
17    year. There is a cycling of nutrients, a  
18    rotation of crops, and reuse of that soil media,  
19    and recycling of water, capturing CO2 from their  
20    heating systems and bringing that back to the  
21    plants.

22                   And, you know, that was a pretty

1       impressive operation, and, you know, are they all  
2       like that? Of course not. I think in all of the  
3       production systems that we see, whether they are  
4       a traditional, so to speak, farm in the soil, or  
5       some of these alternative methods, that's one of  
6       the spirit -- one of the things that is the  
7       spirit of organic, of that continuous  
8       improvement.

9                       That's something that we see in  
10       production. That's something that we in our  
11       certification works always recognize and seek to  
12       improve.

13                      You know, when I asked operations like  
14       this and this -- this one I mentioned in  
15       particular, if they could comply with these  
16       parameters we have talked about, and they said,  
17       "Well, maybe, and, you know, we could certainly  
18       try." But, really, they are committed to the  
19       organic production that they have really been  
20       working with and toward for the last 12 years.

21                      And it just sort of after continuously  
22       designing and adjusting a system and really

1 incorporating those organic principles, you know,  
2 it just kind of struck me as unreasonable and  
3 wasteful to ask them to completely start over to  
4 meet -- to meet something that it feels like they  
5 are already -- they are meeting.

6           You know, as a certifier, I'm sitting  
7 in the seat, you know, looking for as definitive  
8 a line as possible, so that, you know, our  
9 reviewers and inspectors can make consistent  
10 decisions about what -- or what is or isn't  
11 compliant. You know, these are theoretically  
12 dispassionate determinations that are made on  
13 issues, sometimes pretty frayed with a great  
14 amount of passion.

15           You know, as certifiers, we are  
16 certainly not agreed on this. Some of us have  
17 chosen not to certify. Others of course see a  
18 place for this production. The certifier that I  
19 work for, we have one operation. It's a pretty  
20 small operation that is one of those that I have  
21 seen as a so-called next generation grower who  
22 wanted to try the system but wanted to do it

1 using his commitment to organic -- to the  
2 principles and to the regulation.

3 You know, I kind of share, as one  
4 commenter noted, looking at this as more of an  
5 outcome-based system than an input-based --

6 DR. THICKE: I'm going to have to play  
7 Tom's role here pretty soon. Tom is giving me  
8 the swinging finger.

9 MR. RICE: All right. I think CCOF  
10 provides a good example of a way forward on this,  
11 and options included with labeling. And I don't  
12 necessarily see a negative impact of having a  
13 label of differentiation. I see that as perhaps  
14 another part of a compromise that we can move  
15 forward on. I'll leave it at that.

16 DR. THICKE: Thank you, Scott. Dan?

17 DR. SEITZ: So as a consumer member,  
18 and also as someone who has only been on the  
19 board for two years, this is a particularly  
20 difficult issue because I have been on a very  
21 steep learning curve. I haven't yet earned my  
22 Ph.D. in biochemistry, so there is a good deal

1 that -- of technical information that is pretty  
2 tough to assimilate.

3 But in having thought about this  
4 carefully, I will say that I am in support of the  
5 majority compromise position put forward by the  
6 Crops Subcommittee, and I will offer a few of the  
7 reasons that -- upon which I base that.

8 First, as a number of people have  
9 pointed out, the issue is not whether  
10 hydroponics, et cetera, should be allowed. Of  
11 course they should be allowed, but simply whether  
12 they should be allowed to have access to the  
13 organic certification. So I think that to me is  
14 key.

15 I want to say that I'm pleased that  
16 many hydroponic operations are interested in  
17 following the practices contained in the organic  
18 standard, such as avoiding GMOs, avoiding the use  
19 of conventional pesticides and such. I think  
20 that's incredibly positive.

21 So this sector, in my mind, has -- not  
22 only has its place but offers a lot of benefits.

1 Sue just mentioned urban employment, in some  
2 cases shorter distances between farms and  
3 consumers, and a number of other reasons.

4 However, I don't think that the lack  
5 of organic certification will impede innovation  
6 in hydroponics and in farming or the hydroponic  
7 industry in general.

8 A number of testifiers have referred  
9 to lawyers throughout the course of the couple  
10 days of testimony. I don't know if they were  
11 complimentary references or not. I am a lawyer.  
12 So I just want to say that the clear language and  
13 intent of the statute and regulations, as I read  
14 them, truly do limit the organic standard to  
15 soil-based systems.

16 So in OCPA, there are seven references  
17 to soil, none to hydroponics or container  
18 growing. In fact, the only references to  
19 containers are containers referred to in the  
20 context of handling.

21 And it is right up there very  
22 strongly. It says, "Soil fertility" -- under a

1 section called Soil Fertility, "An organic plant  
2 shall contain provisions designed to foster soil  
3 fertility, primarily through the management of  
4 the organic content of the soil through proper  
5 tillage, crop rotation, and manuring."

6 And, similarly, the organic  
7 regulations, there are 53 references to soil,  
8 often with the words fertility and improvement  
9 attached. Again, no references to hydroponics or  
10 container growing. And in the regulations, there  
11 is an entire section pertaining to soil  
12 fertility.

13 So those are indications that that was  
14 certainly not only the intent but very much --  
15 it's not only intent that you have to read in the  
16 language, but it's there clearly presented.

17 The very good point was made that laws  
18 over the course of time may need to be  
19 interpreted differently, especially as  
20 circumstances evolve. But I would say in this  
21 case the continued interpretation of the law as  
22 requiring soil-based makes as much sense and as -

1 - is as relevant today as it was in the -- when  
2 the law and regulations were written.

3 And I think that's because we're  
4 seeing the dramatic effects of things -- of  
5 climate change, and that's not only on the  
6 environment but also on the infrastructure, with  
7 the example of the electrical infrastructure of  
8 Puerto Rico being destroyed in the recent  
9 hurricane.

10 And from what I've read, organic  
11 agriculture can play an important and perhaps  
12 even essential role in carbon sequestration. So  
13 I'd be hesitant to make a decision that may start  
14 to divert the conversion of conventional farmland  
15 -- or divert people from converting conventional  
16 farmland to organic to other approaches to  
17 agriculture.

18 We have also -- I heard one piece of  
19 testimony about the \$800 million experiment of a  
20 large organic grower in trying to do a large-  
21 scale hydroponic operation, and only found that  
22 through that experience some of the plants were

1 more prone to insect and disease problems.

2 And one of the things that has come  
3 through again in things I've heard and in  
4 testimony I've heard is the resiliency of soil-  
5 based agriculture. So in the face of climate  
6 change, in the face of potential infrastructure  
7 disruption, it seems to me absolutely essential  
8 that we have a resilient system.

9 Just a couple of other points. A lot  
10 has been said about consumer expectations, but I  
11 would say that the European Union's direction in  
12 terms of its regulation of hydroponics was based  
13 on their view that consumers see soil-based as  
14 very much identified with organics, and that has  
15 been my experience in talking to people and  
16 visiting many stores and seeing all of the  
17 photographs of the farmers on walls and so forth.

18 DR. THICKE: Dan, you're at about six  
19 minutes.

20 DR. SEITZ: Wow, that goes fast.  
21 Okay. So anyway, in conclusion, I would like to  
22 say that based on my reading of the statute,

1 consumer expectations, and also the importance of  
2 learning from working with nature that I would  
3 support the compromise that was put forward.

4 DR. THICKE: Thank you, Dan. Tom?  
5 I'm going to be timing you, too.

6 MR. CHAPMAN: Yes. We had agreed to  
7 three minutes, just so folks know, and we  
8 definitely don't seem to be able to abide by the  
9 same requirements we put on the public.

10 (Laughter.)

11 MR. CHAPMAN: And I didn't time mine,  
12 so who knows, but let me get started right now.  
13 I only have six points to make, and I'll make  
14 them brief. I generally support the 2010 opinion  
15 -- the 2010 opinion that allowed for growing  
16 media composed of compostable plant material and  
17 compost that was stated by the NOSB to be  
18 rightfully considered soil.

19 I disagree with this proposal because  
20 it focuses -- the focus of this proposal is  
21 purely on inputs. Organic is so much more than  
22 inputs, and the compliance of organic production

1 systems should not be reduced to the source of  
2 nitrogen.

3 I find the carved-out exemptions  
4 fairly arbitrary and lacking in sound logic, and  
5 I find when you take a long and detailed review  
6 of the history of organic hydroponics debate that  
7 it's relevant, and that this issue has been here  
8 since the beginning, and that all previous boards  
9 have failed to sufficiently clarify to move  
10 forward with rulemaking on this subject to either  
11 set standards or to prohibit.

12 And, unfortunately, I fear we are  
13 about to follow in their same footsteps. Most  
14 criticisms on these systems have been related to  
15 sustainability and compatibility with organic  
16 certification systems, and principles are also  
17 applicable to in-ground operations as well.

18 Criticisms of off-farm inputs are  
19 relevant to in-ground operations as well as in  
20 media growers alike who utilize off-farm inputs.  
21 Concerns around the energy used for heating and  
22 lighting, carbon sequestration, mulches,

1 et cetera, are all applicable to in-ground  
2 greenhouses as well.

3 I have also yet to see an end-to-end  
4 comparison of carbon inputs to justify the claims  
5 around the carbon net positive and net negative,  
6 and it seems like these criticisms could be  
7 shaped in any direction at this time.

8 And my last point was not fully  
9 withstanding my first point of supporting the  
10 2010 recommendation, I am intrigued by the  
11 proposal put forward by CCOF and would be happy  
12 to consider this further if it seems possible  
13 that the board could come to a decisive majority.

14 However, it doesn't seem like that is  
15 possible. The board is divided today, like it  
16 has been -- like it has been over the years, and  
17 it reflects the division in the organic  
18 community.

19 Additionally, I don't know if the CCOF  
20 proposal would be considered a compromise  
21 proposal by most of the in-soil growers we have  
22 heard here. And I similarly find it difficult to

1 call the current majority proposal a compromise  
2 when it's not supported by any of the leaders of  
3 the community that grows in media that are  
4 certified organic.

5 In summary, because this is  
6 inconsistent with the 2010 opinion, because it  
7 reduces organic production to input measurements,  
8 because this proposal ignores the history and  
9 diversity of views that bring people to the  
10 organic table, I just can't support this proposal  
11 on aquaponics, hydroponics, and containers as it  
12 is currently written.

13 It says 2:59 and 28 by the way.

14 DR. THICKE: That was very good.

15 Thank you.

16 (Laughter.)

17 DR. THICKE: Ashley?

18 MS. SWAFFAR: So I first want to say  
19 that healthy soils are important, and I do farm  
20 in the soil and see the benefits of healthy soil  
21 and also the challenges of building healthy  
22 soils.

1                   But I do not feel that organic  
2 production should only be granted to those who  
3 grow in the outer crust of the earth. We have  
4 heard from both sides about what their consumers  
5 say about organic and if it should be soil-based  
6 or if hydroponics should be allowed.

7                   I feel like the key factor we are  
8 missing is partially where the customer lives.  
9 Someone buying lettuce or tomatoes in a state  
10 like Vermont probably has different priorities  
11 than the average consumer picking up a box of  
12 organic tomatoes in a big box retailer in the  
13 Midwest or the south.

14                  The organic consumer has different  
15 reasons for purchasing organic products, and I  
16 truly feel the vast majority of those consumers  
17 who purchase organic products do so because they  
18 do not want GMOs or harmful chemicals in their  
19 foods. If we vote to ban hydroponics in  
20 container production, we would remove a large  
21 portion of fresh organic produce from the  
22 marketplace.

1           Another point is we haven't received  
2           any data that states that produce coming from  
3           hydroponics or containers is more harmful than  
4           produce grown in the soil. When looking to  
5           prohibit a practice, something I would expect is  
6           that we would need some type of justification  
7           that the practice would make the product more  
8           harmful, and we have not.

9           I would have hoped that we have --  
10          that we could have came up with a compromise, but  
11          we did not. I would be open to looking at adding  
12          a label requirement for containers and  
13          hydroponics as CCOF had suggested, but I would  
14          say that for me that label would need to include  
15          the USDA organic seal.

16                 That's it. Thank you.

17                 DR. THICKE: Thank you, Ashley.

18                 Jesse?

19                 MR. BUIE: You know, I kind of want to  
20                 take a different approach to this issue. When I  
21                 was honored to be appointed to this board, the  
22                 first thing -- you know, I feel the same way I

1 did about protecting that organic seal as I did  
2 when I was a soldier protecting the American  
3 flag.

4 We live in a competitive -- we live in  
5 a capitalistic society where competition is good.  
6 The market will determine the continued success  
7 of hydro, aero, and aquaponics, and certified  
8 organic, if the consumer has full disclosure as  
9 to how these different operations work.

10 And I want to say it again. Notice I  
11 mention each one of them separate, and certified  
12 organic, and not attaching organic to a different  
13 method for survival reasons, which is what I  
14 constantly hear.

15 I believe that soil is the foundation  
16 of organic, and this subcommittee has really  
17 worked tirelessly to come up with a compromise.  
18 Good or bad, I have seen much work done in trying  
19 to get some consensus. And as everybody has  
20 mentioned, we don't have it yet.

21 But fellow board members, I kind of  
22 want to ask you something, and correct me if need

1 be. The elephant in this room is the fact that  
2 we are trying to solve a problem that kind of was  
3 created above us -- above the chain of command,  
4 and I hope I don't get in trouble. And I'm  
5 honest about that because I do want to serve on  
6 the board.

7 (Laughter.)

8 MR. BUIE: But the ultimate solution  
9 to the problem that we are talking about, the  
10 ultimate solution is for the NOP to enforce the  
11 regulations. It's just that simple. But that  
12 hasn't happened.

13 So I want to say now that what the  
14 Crops Subcommittee is presenting today to vote on  
15 is a very good attempt to come up with a  
16 compromise. I support the position of the  
17 subcommittee -- that the subcommittee has taken.  
18 But, again, I want to say the ultimate solution  
19 is that the NOP enforce the regulation.

20 (Applause.)

21 DR. THICKE: Thank you, Jesse. Dave?

22 MR. MORTENSEN: Thank you, Francis.

1 I'd like to first thank the farmers in the room,  
2 the farmers that took the time to call in for the  
3 conversations, and farmers that I have had the  
4 good fortune to work with in their fields in  
5 Mississippi, North Carolina, Virginia, Iowa,  
6 Nebraska, Pennsylvania, New York, and in The  
7 Netherlands. Greatly informed my perspective on  
8 what is a sustainable agricultural system, and  
9 certainly what I would expect of our organic  
10 labeled cropping system.

11 From my point of view, I have three  
12 concerns that I will flag, and I should just come  
13 out and say, and it won't surprise anyone I don't  
14 think that has heard me chiming in on things,  
15 that I support the majority view.

16 There are three things I will  
17 highlight, although I agree with everything else  
18 that has been said before me. But the three  
19 things I am going to highlight is input  
20 substitution, a climate-friendly sustainable  
21 production system, and then I noticed several  
22 people had an issue with my using the word

1 "natural," so I changed "unnatural" to  
2 "agriculture that defies coevolution." And I  
3 will explain what that means in about a minute's  
4 time.

5           So, in my view, there is no -- there  
6 is no lack of clarity on the issue about  
7 sustainability and about the carbon footprint of  
8 agriculture here. There isn't. At least if you  
9 look at the published literature and the farms  
10 that I visited, organic farms are -- this is a  
11 paper in Nature recently published, meta-analysis  
12 across many farms around the world, is storing 12  
13 to 26 percent more carbon in the soil than any  
14 other form of agriculture. Period.

15           That's great. Thank you, organic  
16 farmers. Thank you.

17           On the other -- on the flip side of  
18 it, to produce a crop, if we -- and we tried to  
19 put these numbers into a number that we can wrap  
20 -- I could, and we could wrap our heads around, a  
21 tomato. A pound of tomato. An organic farmer in  
22 the soil produces a pound of tomato while

1 releasing .2 to .7 pounds of carbon dioxide, a  
2 greenhouse gas that we know is increasing in the  
3 atmosphere.

4           When I was young, like many of you, I  
5 was studying this at Duke University, 310 parts  
6 per million carbon dioxide. We passed the 410  
7 million -- parts per million carbon dioxide  
8 concentration in April of this year. That was  
9 our experimental target we were thinking we would  
10 reach 50 years out when I was 30 years old.

11           So .2 to .7 pounds CO2 release per  
12 pound of tomato in hydroponic systems -- now this  
13 is a meta-analysis here, so we could argue the  
14 data. So I tried to present ranges so as not to  
15 bias. 2.22 to 10 pounds of carbon dioxide are  
16 released for each pound of tomato. That's an  
17 order of magnitude greater footprint carbon  
18 dioxide release for the production of vegetables  
19 in a hydroponic system.

20           In my view, that's not sustainable.  
21 Climate change is a huge deal for us, make no  
22 mistake. We've got three Nobel Prize winners

1 where I teach, and this is a huge issue. I grew  
2 up in New York City. I taught in Spanish Harlem.  
3 I have worked with kids in the inner city, and I  
4 have seen the subway systems flooded in New York  
5 from Hurricane Sandy where my kids live.

6           Lettuce production in the desert of  
7 Arizona and New Mexico, 82 times the energy  
8 required to grow lettuce in the ground, in the  
9 soil. 82 times. Unsustainable. That's where  
10 I'm coming from when I say the inputs are  
11 unsustainable and I don't see much of an argument  
12 against that, frankly.

13           Unnatural. Taking a plant that has  
14 evolved in the soil and changing the production  
15 system, so that we will now grow the plant in  
16 water and bathe it with nutrients, I say is  
17 unnatural, I say defies coevolution in important  
18 ways, and we know this. It's published. Roots  
19 produce whole suites of cells at the tips of  
20 their roots that talk to the microbial community  
21 in the soil, a diverse microbial community in the  
22 soil. They are called border cells.

1                   They are washed away in a nutrient-  
2 bathed growing environment. Those very cells are  
3 sending signals back to the root cells and to the  
4 shoots that are mediating the phytochemical  
5 reaction of the shoots up-regulating the  
6 production of valuable secondary metabolites that  
7 affect human health in a very positive way.

8                   We are running long on time. The  
9 argument about diversity in the soil is, to me,  
10 silly. I could spend an hour on that. And I  
11 don't mean to be condescending, but it's silly.  
12 We are taking bacteria and fungi and comparing  
13 that to soil where we've got 10 or so trophic  
14 levels, 20 functional groups compared to two. To  
15 me, we need to just talk about the data as  
16 opposed to imagined realities about biodiversity.

17                   I'll stop there.

18                   DR. THICKE: Steve?

19                   MR. ELA: Well, this is hard. When I  
20 was a grad student, my office at the University  
21 of Minnesota in St. Paul was in the basement of  
22 Borlaug Hall. Norman Borlaug, father of the

1 green revolution, savior of the planet, in that  
2 he was going to with hybrid seeds and fertilizers  
3 -- we were going to increase food production and  
4 help the whole world feed itself.

5 And I came out of the conventional  
6 agricultural system and, you know, but when I was  
7 in school I looked at that a lot. And basically  
8 those kinds of systems were guaranteed to  
9 increase access, increase production. They were  
10 better and they were innovative.

11 I've heard that about GMOs. I've  
12 heard that about NPK fertilizers. And so I come  
13 today from the heart of the precautionary  
14 principal and of human hubris, and all of those  
15 systems have come back to bite us in the butt  
16 because they don't take into account the whole  
17 ecosystem.

18 As humans, we want to believe that we  
19 can recreate very complex systems and that we  
20 mimic them very well. And as we go down the  
21 road, whether it's with DDT or many of these  
22 other things, we find later that there are

1 unintended consequences.

2           So as a grower, and I've been farming  
3 my whole life, but full-time since 1990, for 27  
4 years, starting conventionally, transitioning to  
5 organic, now as a full organic grower, I realize  
6 that we're farming very complex systems, and we  
7 don't know what is happening in our soils, yet we  
8 do know there is cycling, we know there is tie-up  
9 and release, we know there is carbon  
10 sequestration and release. We know there are  
11 multiple layers, including high-end predators and  
12 low-end plants.

13           We know it's a system that can create  
14 its own nutrition through nitrogen fixation and  
15 legumes, and one that includes multiple plant  
16 species. I'm a perennial plant grower. And if  
17 you come out, our crop rotation is all the time  
18 under the trees, multiple species, multiple  
19 levels, nitrogen fixation, and my goal as a  
20 grower is to grow all my own fertility. I'm not  
21 there yet, but that is my goal.

22           I don't believe that we can engineer

1 or redesign a replica of this complex system, and  
2 a complex system that we have yet to understand.  
3 All the soil science -- my background is in soil  
4 science. That was my master's degree. We only  
5 understand the tip of that iceberg, and so I do  
6 not believe we can redesign that system because  
7 we don't even know what that system is.

8 I don't believe that the -- and I'm a  
9 scientist, but I don't believe that the science  
10 exists to make a complete choice. With any new  
11 material added, we want to dive ahead and figure  
12 that it's okay, but so often we find that that  
13 new material isn't okay.

14 And for me, I have great respect for  
15 the hydroponic, aquaponics growers. They are  
16 very, very intriguing systems, and I believe in  
17 the integrity of those people and in their best  
18 intentions. And I believe that we don't know,  
19 and so I'm going that very cautionary. And at  
20 this point, until we have a better understanding  
21 of soils, I want to know -- I'm going to stay  
22 with the soil.

1                   We have talked about water, and that  
2                   has come up in a lot of the public comments.  
3                   Here is a picture of one row of my farm. It's  
4                   some plums. You can see two very different cover  
5                   crops. The only difference in that row is water,  
6                   and it's not the amount of water.

7                   Those two sides were planted to the  
8                   cover crop exactly the same way. They are both  
9                   under drip systems that are exactly the same,  
10                  providing the exact same amount of water. One of  
11                  them has a drip line that is buried, and one of  
12                  them has above ground. It is striking, and the  
13                  only difference is how the water is applied, and  
14                  it changes that whole ecosystem. Explain that to  
15                  me.

16                  It's not simply about nutrients being  
17                  carried in water and plants taking them up. It's  
18                  about a complex system right there that is night  
19                  and day that I have no clue about. The other  
20                  thing I believe is in this system that is  
21                  resilient, it can respond to changes.

22                  And to wind it up, I can say that in

1 part of my orchard, part of my ecosystem, the  
2 more I farm, the more I value letting the  
3 ecosystem function and regulate itself, and  
4 growing wonderful food with less, not more,  
5 management. The longer I farm, the less I know.

6 And I really became an organic farmer  
7 not because of what I know but because of what I  
8 don't know.

9 DR. THICKE: Thank you, Steve.  
10 Joelle? No. Michelle volunteered to turn that  
11 on, so let's -- it's probably not fair.

12 MS. MOSSO: I'm timing myself, so  
13 you're all right. I'm actually going to take a  
14 different approach, and I definitely support and  
15 can hear the conversation from all the growers in  
16 the room and the growers who have over time given  
17 comment. However, I also would like to emphasize  
18 that is not the entirety of our organic  
19 community, and there are a lot of people who  
20 participate, whether it just be in the purchase  
21 power of their dollar, or in a more involved way  
22 within their own maybe micro-organic community.

1           The beauty of our label is that we  
2           have been allowing inclusive methods that have  
3           allowed for innovative development, and allowing  
4           not just for development but for the purchase  
5           spectrum of organic consumers. And to deny some  
6           of the consumers what they associate as organic  
7           simply because one fraction of the community  
8           feels that it is such, I don't know that that is  
9           an appropriate thing to do at this point.

10           And so I would be more in support of a  
11           label that would give transparency and allow for  
12           free capitalism in this market, to allow the  
13           market to grow in an organic way, driven by the  
14           consumers as well as the producers. And I do  
15           think the absence of that consumer voice has been  
16           noted in this conversation. I think that is  
17           pretty evident in the last couple days, but it is  
18           certainly a voice which has gotten us to the  
19           platform and the foundation of our market, which  
20           we sit at today and have the luxury of debating a  
21           \$50 billion industry.

22           They are certainly within our own

1 ecosystem of the organic community. And I think  
2 as we celebrate biodiversity, both in our  
3 production methods, we also need to recognize the  
4 import of everyone's opinion that has been  
5 participating in this organic community since the  
6 genesis of the program. And I will leave it at  
7 that.

8 DR. THICKE: Thank you, Joelle. I  
9 think you were the fastest there. Asa?

10 MR. BRADMAN: So this is the hardest  
11 decision I'll ever make, and it's kind of  
12 emotional in a way. A lot of what Sue said  
13 resonates for me, and I kind of want to just  
14 repeat everything that she said, and, plus, the  
15 opportunity for those different communities to  
16 have access to the organic label.

17 I am pro-soil. I mean, I don't think  
18 anyone here is anti-soil. And as Sue said, you  
19 know, my yard looks like the pictures that  
20 Harriet put up on the screen, and that is kind of  
21 where a lot of my soil is. At the same time, I  
22 feel like there is a lot of division in this

1 community, and I try to be a peacemaker. I like  
2 to see compromise, and I understand that this  
3 container production is seen as a compromise, but  
4 I don't think it reflects the full breadth of the  
5 existing community, including, you know,  
6 generational and founders of organic farming and  
7 their children.

8           There is division across this board.  
9 There is division in the community. There is  
10 division on the board of trustees of the organic  
11 center, which I participate on. There is  
12 division between certifiers, and there is  
13 division within certifiers. So I feel like there  
14 is a potential opportunity for compromise. I see  
15 that in the labeling front.

16           And, you know, last spring I said very  
17 clearly that I wanted to vote for something, not  
18 against something. And what I would like to vote  
19 for is a deeper compromise that allows for some  
20 labeling, allows for transparency, and also can  
21 set standards. I think there is a lot of great  
22 points about the kind of ick factor when we see

1 highly mechanized, controlled environment  
2 agriculture. And I think there is an opportunity  
3 to develop standards that address that in terms  
4 of organic.

5 And I don't know. I mean, some of the  
6 suggestions are that, you know, hydroponic have  
7 its own label, sustainable safe or something like  
8 that. But the reality is I think there is an  
9 intent in those systems to really adhere to the  
10 principles of OCPA and the principles of an  
11 environmentally productive agriculture, and I  
12 think that has to be validated.

13 Soil is not going to go away. And in  
14 terms of energy consumption, things like that, I  
15 think those are important issues and should be  
16 evaluated for every product. You know, if we had  
17 an organic strawberry in Maine in the winter, it  
18 comes from California. And it may have been  
19 grown in the soil, but is that really, you know,  
20 accounted for environmentally in terms of its  
21 carbon footprint?

22 You know, I grew up, you know, reading

1 Rodale magazines and, you know, in a way  
2 contributing to the community is my dream. I  
3 didn't want to work on this issue. I didn't even  
4 know it existed, you know, my expertise in things  
5 like inerts and sanitizers and stuff like that.  
6 But I feel, again, inclusion is better than  
7 exclusion.

8           You know, I see in the Salinas Valley  
9 and other -- dump truck loads of manure being  
10 trucked into farms that are growing, you know,  
11 organic in the soil. This manure may, in fact,  
12 come from CAFO-type organizations.

13           In meeting with, you know, an owner of  
14 a very large operation, there -- you know, from  
15 his point of view there is not enough, you know,  
16 the way he put it, S-H-I-T, to grow organic. And  
17 part of the problem was that the land is leased,  
18 and there is not the resources to have the kind  
19 of I think cycling that we might want to promote.  
20 But either way, that place was fully certified  
21 and fully organic.

22           And just to understand that there is

1 kind of extremes in all of these arenas, and I  
2 feel like, again, an opportunity for compromise  
3 could -- label compromise could solve some of  
4 these issues and provide transparency, and then  
5 we can also direct evolution in any system  
6 towards a more sustainable and environmentally  
7 sound system.

8 DR. THICKE: Thank you, Asa. Lisa?

9 MS. DE LIMA: Well, I'm not sure I can  
10 say it any better than Asa just said it. I  
11 definitely echo and agree with a lot of what you  
12 said, especially about I wish we had had an  
13 opportunity to work more on a standard to  
14 encourage the types of alternative production  
15 systems that do reflect organics, and that I  
16 think would resonate with consumers, the same as  
17 operations in the ground.

18 Hydroponic operations, like Scott  
19 mentioned, they don't all look the same. And I  
20 would really like to find a way that we can  
21 encourage the ones that are on the end of the  
22 spectrum that we are comfortable with.

1           I heard somebody yesterday in public  
2 comment equate folks who aren't solely pro-soil  
3 with people that deny climate change, and I took  
4 huge offense to that. I'm not denying that  
5 organic soil production isn't great for a lot of  
6 reasons. I'm definitely an environmentalist  
7 first. I got into organics because I was an  
8 environmentalist, and I saw organics benefit to  
9 help with a lot of different environmental  
10 issues. Obviously, climate change is the biggest  
11 one, but there is a lot of other ones as well.

12           So I don't think that just because a  
13 reduction system doesn't directly nourish the  
14 soil in the upper crust of the earth that that  
15 inherently makes it a harmful growing approach.  
16 I just think we need all the help we can get in  
17 addressing ag's impact on the environment and not  
18 just climate change. And I'm at this point not  
19 really willing to rule out alternative  
20 approaches.

21           Asa touched on labeling. When we  
22 first started this conversation, or I got

1 involved in the conversation two years ago, I was  
2 pretty opposed to a label. You know, I talk to  
3 and interact with consumers on a daily basis.  
4 You know, I don't have as many consumers as Alan  
5 from Natural Grocers was talking about. Maybe a  
6 quarter of that, a quarter-million consumers come  
7 through our doors.

8 And I initially thought you put  
9 another label out there or a version of the USDA  
10 organic label and we're just going to create more  
11 confusion. And I still think that. I don't --  
12 it's not my first choice to put a label out  
13 there. To me, that's my compromise position is  
14 to put a label out there and let consumers make  
15 their choice.

16 I can't really speak for all  
17 retailers. We're not a close, tight-knit group.  
18 We don't have a lot of interaction with one  
19 another. I only saw comments from, you know, two  
20 retailers, and neither of them were  
21 pro-hydroponic, so we're not on the same page  
22 there. But they both did say that at a minimum

1 they would like to see labeling transparency, so  
2 the consumer can make the choice. And I would  
3 echo that sentiment as well.

4 DR. THICKE: Thank you, Lisa. A-Dae?

5 MS. BRIONES: So today is Schkopapani  
6 (phonetic) in my village, and it's a day my  
7 village celebrates our ancestral connections by  
8 going outside and digging holes in the dirt as a  
9 community, all 800 of us.

10 Indigenous people have advocated and  
11 argued for the protection of our lands, which is  
12 a member and I dare say a relative of our tribal  
13 community since creation, even if those lands are  
14 no longer in our ownership. Being indigenous,  
15 being Cochiti, is to advocate for a way of life  
16 that connects us to our environment, to our  
17 natural and human community, and to our food.

18 But what we can learn from this  
19 collective experience, which is in its 520th  
20 year, is that when we make an argument that  
21 solely relies on protection of the earth it is  
22 consistently defeated one way or another by

1 whatever fleeting economic interest exists of the  
2 time, or even solicits military assault like we  
3 saw in Standing Rock, but I digress.

4 Mr. Feldman said that the NOSB must  
5 not avoid fires. If I rely solely on my  
6 emotional attachment to arguments about  
7 protecting the earth, I would be essentially  
8 forging a fragile position within the organic  
9 community against those outside this community.

10 Perhaps this is a time where we find  
11 opportunities to create beneficial partnerships  
12 between indigenous people and the organic  
13 community. In order to do that, we need to find  
14 spaces for these communities to come together.

15 Before us is an argument to limit that  
16 space to those who only have soil. Law and  
17 regulation is meant to protect groups of people  
18 and discourage undesirable behaviors in our  
19 community, and I wonder who we are protecting  
20 when I see so few tribal communities, tribal  
21 people, black farmers, Hispanic farmers, arguing  
22 for only -- soil-only operations.

1           Quite frankly, the legal authority on  
2 this issue is conflicting. Unlike what Dan said,  
3 I don't think the law is clear. While OCPA  
4 limits -- clearly limits hydroponic operations,  
5 the NOP has clearly stated it is allowed. So any  
6 legal argument one way or another is going to be  
7 on shaky ground.

8           So with that, I echo CCOF's position  
9 that we should be a community that is inclusive.  
10 And if we take a lesson from nature, biodiversity  
11 makes any community stronger, and that includes  
12 our organic community. So I support a hydroponic  
13 label that will be regulated and standardized  
14 under the organic label.

15           DR. THICKE: Thank you, A-Dae. So you  
16 can get your tomatoes out. In three minutes, you  
17 can hit me with them. Okay.

18           I was milking cows the other day and I  
19 saw a frog. Once in a while, I've got to pick up  
20 a frog and take it out. And I realized that I  
21 have frogs in there; I have bacteria and fungi.  
22 This is a concrete and steel building here. I

1 have algae. I have millipedes. I have  
2 earthworms coming out of the cracks. I have  
3 birds that come in and build nests. And my  
4 inspector doesn't like it, but I let them do it  
5 sometimes anyway.

6 I pass my inspections really well, but  
7 I have all these trophic levels in my concrete  
8 and steel building that we are talking about for  
9 hydroponics. So I think that this trophic level  
10 thing is really a diversion. It's really a bogus  
11 -- it doesn't mean anything.

12 Like Asa has told us repeatedly,  
13 biology is everywhere. On our skin -- we know  
14 there are thousands of bacteria species that have  
15 been found on skin, a hundred different kinds of  
16 algae. Biology is everywhere. To say my milking  
17 parlor is soiled because it has all these trophic  
18 levels is nonsense, the same way to say that  
19 these hydroponic operations that have these  
20 things here are soil is nonsense, and I think  
21 that we shouldn't get caught into that.

22 And I looked at the CCOF proposal. It

1 means nothing. It means business as usual. If  
2 you're hanging your hat on that, that is no  
3 compromise. I think -- I am in favor of soil. I  
4 think we've got to compromise in the middle, and  
5 I think that others are looking for status quo,  
6 and I think that's not good.

7 One more quick thing I wanted to do is  
8 Tom has talked about the 1995 recommendation.  
9 And I found the letter from Michael Sligh, and he  
10 was there when that happened. He said that they  
11 were required to make recommendations on a whole  
12 range of things. And they just went through them  
13 real quickly, and some of them weren't going to  
14 vote for it. But they said as long as they put  
15 in a thing that said if -- how was that? If it  
16 can meet the standards, then they were okay to  
17 vote for it. But they are not in favor -- the  
18 rest of the guys were not in favor of it.

19 There was one person they said that  
20 was in favor of that thing, of allowing  
21 hydroponics if the rules allowed. So I think  
22 that really doesn't set any precedent, frankly.

1                   So how am I doing for time? I'm done.

2                   Thank you.

3                   One more thing that I can say is I  
4                   don't like to --

5                   (Laughter.)

6                   DR. THICKE: All these arguments about  
7                   water and so on, I call that environmentalist  
8                   reductionism. I think we have to look at the  
9                   whole system. Soil is a system, and we're not  
10                  going to argue about all these things here. We  
11                  can argue on both sides of them, and I think we  
12                  just have to look at what organic farming is.

13                  I'm one of these old guys, I started  
14                  farming in 1975 organically. And so I guess  
15                  that's why I'm on that side.

16                  Thank you.

17                  So here we are. What do we do next?  
18                  Dan, what do you say?

19                  DR. SEITZ: Well, one thing that I did  
20                  hear that was in common among the two different  
21                  positions that were put forth was the idea of  
22                  labeling. Not everyone was necessarily

1 comfortable with labeling, but it did jump out as  
2 something of a compromise, and it certainly  
3 reflects the idea of transparency, consumer  
4 choice, and so forth.

5 So even though I think the paradigms  
6 that are reflected in the two views are pretty  
7 opposite, that is one area where I felt there was  
8 some commonality.

9 DR. THICKE: Okay. Thank you. Emily?  
10 I think we have to decide what we're going to do  
11 here, if we're going to vote. Have you got a  
12 suggestion?

13 MS. OAKLEY: Yeah. I was just going  
14 to mention the time factor of 6:20. So we could  
15 discuss more amongst ourselves. I'm not sure how  
16 far that will get us. Just in -- I know there  
17 was some hope that maybe we could discuss a  
18 possibility of a label compromise.

19 I think that that is maybe a little  
20 far-fetched. I wish that we could, but I don't  
21 think that there is enough consensus on that.  
22 That's just my personal view.

1 I do want to see us vote, as you all  
2 know, on this proposal today. So, yeah.

3 DR. THICKE: Harriet?

4 MS. BEHAR: So a good compromise is  
5 typically something nobody likes. Everyone has  
6 given up something, and they had to give -- they  
7 are not happy. So I have brought this up before.  
8 I know my fellow soil people maybe won't like it,  
9 but I'm going to bring up a labeling compromise.  
10 And probably nobody will like it, but I really  
11 think it is a compromise. And that would be --  
12 and I don't even know if the NOP can do this, but  
13 I'm looking again to the regulation.

14 And we have a made with label for  
15 processed foods. It does not get the USDA  
16 organic seal, but it is a certified organic  
17 product. So there could be a hydroponic label  
18 produced with organic inputs, and it would be  
19 hydroponic with half -- then the label underneath  
20 produced with organic or organically approved  
21 inputs, or whatever, half the size of the word  
22 hydroponic, similar to the made with label.

1                   And it has been a place that many  
2 processors have had an organic product. I know  
3 it doesn't -- it doesn't necessarily make me  
4 happy, but I want to protect that organic seal.  
5 I know that the hydroponic people want that seal,  
6 too, but I think that that's a pretty strong  
7 compromise for both sides. No seal, but you get  
8 the word "organic" there, similar to the made  
9 with.

10                   And I think it's a recognition that  
11 hydroponic also does not meet all of the  
12 requirements as I had in my presentation that a  
13 soil-based operation meets.

14                   DR. THICKE: So, Harriet, I think that  
15 if we were to talk about that, we'd have four  
16 hours ahead of us. So I am okay with voting now.  
17 Anybody have a problem with that?

18                   MR. BRADMAN: Well, I mean, it looks  
19 like if we vote, it's not going to pass. So --

20                   DR. THICKE: Are we going to bring a  
21 sword out here for you, Asa?

22                   MR. BRADMAN: What was that?

1 DR. THICKE: Are we going to get the  
2 sword -- the sword for you?

3 MR. BRADMAN: I would like a sword  
4 right now.

5 (Laughter.)

6 MR. BRADMAN: Maybe I would throw  
7 myself on it.

8 (Laughter.)

9 MR. BRADMAN: Metaphorically. I'm  
10 probably doing that anyway.

11 But if -- I mean, Harriet, what you  
12 say I think is intriguing. If it's not going to  
13 pass, maybe we should send it back to committee.  
14 I know that everyone would groan, and then, you  
15 know, maybe an idea like Harriet just proposed  
16 can be considered.

17 I know that's probably not popular,  
18 but it's still at least something I think that  
19 should be said out loud.

20 DR. THICKE: Emily? And then who was  
21 next? Dan.

22 MS. OAKLEY: Well, I'm definitely not

1 in favor of a labeling compromise, which I guess  
2 you guys already know. But I don't think that  
3 voting on this proposal precludes further  
4 conversation on that, not that I want to have to  
5 be involved in it, but I think it's important to  
6 vote on this proposal for the public stakeholders  
7 or the community at large to see where the NOSB  
8 falls on this issue.

9 And, in fact, if there really isn't an  
10 ability to have a compromise on containers, it  
11 actually makes me not want to vote for that  
12 motion either, because that's a huge compromise  
13 for me, and I don't even want to see that. So it  
14 will have to -- it will give me something to  
15 think about.

16 DR. THICKE: Dan was next, and then  
17 Sue.

18 DR. SEITZ: Well, I don't think it's  
19 that hard to count the votes, given the different  
20 feedback that people -- I mean, just counting the  
21 votes, I can say pretty certainly that any of  
22 these motions are likely to fail.

1                   And what I have heard from a number of  
2 people is the possibility that there may be some  
3 compromises here. I have heard the idea of  
4 labeling. I don't know if it would be along the  
5 lines that Harriet proposed. I have heard the  
6 idea of if we are going to allow hydroponics that  
7 it should be still a fairly strict standard,  
8 along a continuum of potential practices out  
9 there.

10                   So I don't agree that every compromise  
11 is necessarily a lose-lose situation. Sometimes  
12 groups can work through very difficult issues and  
13 reach a higher-order decision sometimes. I'm not  
14 sure if this one is possible, but it can happen.  
15 So it seems to me in the face of the probable  
16 rejection of the motions that, why not send it  
17 back especially since there are some areas that  
18 may be --

19                   DR. THICKE: Sue had a comment.

20                   MS. BAIRD: First of all, and this is  
21 question for NOP, is there -- do we have a legal  
22 right to create a new label under the law?

1 DR. TUCKER: That's a good question.  
2 I think -- so, first, before I dive into  
3 answering that question, first, I'd just like to  
4 thank both everyone who gave public comment on  
5 this issue, but also just the thoughtfulness and  
6 passion that went into all of the board's  
7 comments. So thank you for that. There is a lot  
8 of soul and thought there. So I just want to say  
9 that.

10 I think there are some really, really  
11 interesting ideas and alternatives that have been  
12 raised through public comment and through this  
13 discussion. So I think what the next -- for us  
14 the next step would be -- in that kind of idea  
15 would be to sort of regroup after the meeting and  
16 talk about what the next steps might be here in  
17 terms of the subcommittee work. What does that  
18 look like moving forward? Because I think a lot  
19 of interesting ideas have been raised that are  
20 worth continued discussion.

21 DR. THICKE: Tom, you had your hand  
22 up.

1 MS. BAIRD: But I wanted --

2 DR. THICKE: And then I want to say  
3 something after. Oh, did you -- you didn't --  
4 oh, you didn't do it. I'm sorry. Sue had her  
5 hand up.

6 MS. BAIRD: No. Well, I wanted to  
7 state that I think the public deserves us to make  
8 a vote. And I --

9 (Applause.)

10 MS. BAIRD: I was the one who stated I  
11 hate more than anything this me versus thee, but  
12 I think we've drug this on forever. We need to  
13 take a public vote.

14 DR. THICKE: I would agree. Tom?

15 MR. CHAPMAN: If there's a possibility  
16 for a compromise that would get the votes, I am  
17 supportive. But if there is not, and it is going  
18 to continue this on as another agenda item to  
19 bring up in discord in another six months, then I  
20 think we should vote now.

21 DR. THICKE: Okay. Did you have your  
22 hand up, Harriet?

1                   MR. MORTENSEN: Yeah. I also am of  
2 the opinion -- I am of the opinion we should  
3 vote. I think we have multiple motions, so it's  
4 not clear where people are on the multiple  
5 motions. And I also feel like, man, how long are  
6 we going to drag this out? Let's just go for it  
7 and see where we are. Let's go for it.

8                   DR. THICKE: Harriet, do you have  
9 something short to say?

10                  MS. BEHAR: So if we do vote and it  
11 fails, you never know, does -- we do have  
12 containers still as a discussion document where  
13 at least in a container system, which hydroponics  
14 are, we could still work on it in some way or  
15 fashion, at least some aspects of hydroponic, in  
16 building some sort of -- but, I mean, there's no  
17 saying how that might work out.

18                  We might not even be able to decide on  
19 artificial light or recycling or any of those  
20 things that were just in that discussion  
21 document. But hydroponic is a lot more than  
22 that, those systems. There is, you know, the

1 whole energy thing and whatever we want to  
2 discuss.

3 But in any case, I think it still  
4 would be somewhat on the work agenda through that  
5 discussion document. Am I correct? I see Paul  
6 kind of going like this. I don't know for sure.

7 DR. THICKE: Okay. Ashley has got  
8 something, and then I want to follow you. Go  
9 ahead.

10 MS. SWAFFAR: Okay. Yeah. I think it  
11 is important to take a vote on this because I  
12 think it will show the community how divided our  
13 board is. But I would encourage us, after this,  
14 if we think there is some type of consensus that  
15 we can reach on a label, I would like for us to  
16 explore that, because, honestly, if this -- it's  
17 a stalemate, basically.

18 If anybody can count the votes, it's a  
19 stalemate. Nothing will change. So it's going  
20 to be the same fight forever. So if we can  
21 figure out something reasonable, I would really  
22 like to see us work on that in the future.

1 DR. THICKE: So I am going to make a  
2 motion on aeroponics right now. I make the  
3 motion to prohibit aeroponic production systems  
4 from organic certification.

5 MR. CHAPMAN: The motion is there.  
6 You would either call the question if you want to  
7 end debate on it. The motion is already there.

8 DR. THICKE: That's right. Okay.

9 MR. CHAPMAN: Yeah.

10 DR. THICKE: I will call the question.

11 MR. CHAPMAN: So the question has been  
12 called. There isn't a second. Is there a second  
13 for it?

14 DR. THICKE: There is one on record, I  
15 believe.

16 MR. CHAPMAN: So calling the question  
17 is a motion to end debate, basically, and proceed  
18 --

19 PARTICIPANT: I'll second it.

20 MR. CHAPMAN: -- to the vote. So  
21 there's a second there. Is there an objection to  
22 the motion? If there is no objection, then we'll

1 just proceed to the vote. If there is an  
2 objection, then we will take a vote. It takes a  
3 two-thirds vote to end discussion and move to the  
4 vote.

5 There is no objection to the call the  
6 question, so we will just go to the question,  
7 which, sorry, I wasn't ready for it. So it's  
8 going to take me a second to pull it up.

9 So the first motion before us is on  
10 aeroponics. So the motion reads --

11 (Simultaneous speaking.)

12 MR. CHAPMAN: Yeah. I would prefer to  
13 go off -- if you have the written proposals, to  
14 go to that. Can you pull up the actual written  
15 proposal? I'd rather pull off that.

16 All right. I'm going to read it and  
17 then it will come up. Aeroponics. Discussion of  
18 aeroponic systems do not require -- the  
19 definitions come later. I guess the definitions  
20 are just in the document. So the proposal is, as  
21 defined in this document, motion to prohibit  
22 aeroponic production systems from organic

1 certification.

2 The motion was made by Emily and  
3 seconded by Harriet. It comes as a seconded  
4 motion from the subcommittee, and the voting will  
5 start with Dan. He's in the hot seat.

6 A yes vote on this means you are  
7 voting to prohibit aeroponics as defined here,  
8 and a no vote is you are rejecting this proposal,  
9 this specific proposal. And just so we're clear,  
10 the glossary here, aeroponics is defined as a  
11 variation of hydroponic plant production, which  
12 plant roots are suspended in air and misted with  
13 a nutrient solution.

14 Dan.

15 DR. SEITZ: Yes.

16 MR. RICE: Yes.

17 MS. BAIRD: Yes.

18 MS. BEHAR: Yes.

19 MS. OAKLEY: Yes.

20 DR. THICKE: Yes.

21 MS. BRIONES: Yes.

22 MS. DE LIMA: Yes.

1 MR. BRADMAN: Abstain.

2 MS. MOSSO: Yes.

3 MR. ELA: Yes.

4 MR. MORTENSEN: Yes.

5 MR. BUIE: Yes.

6 MS. SWAFFAR: Yes.

7 MR. CHAPMAN: The Chair votes yes.

8 The tally is 14 yes, zero no, one abstention.

9 The motion passes.

10 The second motion -- can you continue  
11 scrolling? Is on aquaponics. Yeah. I'm going  
12 to first read the definition of aquaponics that  
13 is put forward in the majority position.

14 Aquaponics. The recirculating  
15 hydroponic plant production system in which  
16 plants are grown in nutrients originating from  
17 aquatic animals, wastewater, which may include  
18 the use of bacteria to improve the availabilities  
19 of these nutrients to plants. The plant improve  
20 water quality by use of nutrients, and water is  
21 then recirculated back to the aquatic animals.

22 The motion, which comes seconded from

1 the subcommittee, is a motion to prohibit  
2 aquaponic production systems from organic  
3 certification. The motion was made by Harriet  
4 and seconded by Jesse.

5 A yes vote would be to accept this  
6 proposal to prohibit aquaponics. A no vote would  
7 be to reject this proposal. The voting will  
8 start with Scott. Sorry. Is there a question?

9 MS. OAKLEY: Can we have further  
10 discussion?

11 MR. CHAPMAN: We've technically called  
12 the question, which would have been all four  
13 votes, but I'm fine with -- I mean, yeah, let's  
14 have a discussion if it's necessary.

15 MS. OAKLEY: Okay. Just a quick one.  
16 I just am confused if there are people that are  
17 able to vote to prohibit aeroponics, you know, is  
18 that going to fall across the rest of their  
19 voting as well? I'm not sure what the  
20 differentiation would be. Does that not make  
21 sense?

22 MR. CHAPMAN: No.

1 MS. OAKLEY: Okay. If you can vote to  
2 prohibit aeroponics, what is the parsing of the  
3 difference between some of the other systems that  
4 we have been discussing?

5 MR. CHAPMAN: I stand by the 2010  
6 standard. That is the basis of my voting right  
7 now, and I have found that system to be  
8 disapproved by the 2010 system -- the 2010  
9 recommendation.

10 MR. RICE: I would echo that as well.

11 MR. CHAPMAN: Francis, you are still  
12 technically running the meeting now. Do we want  
13 to proceed to a vote or --

14 DR. THICKE: I'm sorry?

15 MR. CHAPMAN: You're still technically  
16 running the meeting right now. Do you want to  
17 proceed to a vote or continue --

18 DR. THICKE: I'm not real sure what  
19 you're talking about, to tell you the truth.

20 (Laughter.)

21 MS. OAKLEY: Just that we voted to  
22 prohibit aeroponics.

1 DR. THICKE: Yes.

2 MS. OAKLEY: Which is a system within  
3 the hydroponics family and -- in my view, and I'm  
4 wondering what the differentiation might be for  
5 someone who can vote to prohibit aeroponics but  
6 then might subsequently vote to allow  
7 hydroponics. I was just wondering what -- they  
8 could help me understand their thinking.

9 DR. THICKE: Okay. Does anybody want  
10 to respond?

11 MS. OAKLEY: I mean, I think they have  
12 already answered that. If they feel that they  
13 have answered it with the 2010 recommendation, if  
14 that's their answer, then that's what they are  
15 telling me.

16 DR. THICKE: Okay. So are we going to  
17 have any more discussion, or do we want to -- any  
18 further discussion? Okay. Then I guess we can  
19 proceed to the next vote.

20 MR. CHAPMAN: Okay. So I'm not going  
21 to read the definition of aquaponic production  
22 again. I'm just going to read the motion. The

1 motion is to prohibit aquaponic production  
2 systems from organic certification. Motion by  
3 Harriet; seconded by Jesse.

4 A yes vote is to prohibit. A no vote  
5 is to reject -- is to accept the proposal to  
6 prohibit. A no vote is to reject the proposal.  
7 The voting will start with Scott.

8 MR. RICE: No.

9 MS. BAIRD: No.

10 MS. BEHAR: Yes.

11 MS. OAKLEY: Yes.

12 DR. THICKE: Yes.

13 MS. BRIONES: No.

14 MS. DE LIMA: No.

15 MR. BRADMAN: No.

16 MS. MOSSO: No.

17 MR. ELA: Yes.

18 MR. MORTENSEN: Yes.

19 MR. BUIE: Yes.

20 MS. SWAFFAR: No.

21 DR. SEITZ: Yes.

22 MR. CHAPMAN: The Chair votes no.

1 Seven yes, eight no. The motion fails.

2 DR. THICKE: So we are ready for the  
3 next motion.

4 MR. CHAPMAN: Do we want further  
5 discussion on the next motion, or should we just  
6 proceed to the vote?

7 DR. THICKE: Does anybody want further  
8 discussion? I guess we can --

9 MR. CHAPMAN: Okay. Can we scroll to  
10 that? I don't believe I need to read the  
11 definition here. So I guess a container is  
12 defined as any vessel or associated equipment  
13 used to house growing media, and the complete  
14 root structure of terrestrial plants to prevent  
15 roots from contacting soil or the surface beneath  
16 the vessel such as, but not limited to, pots,  
17 troves, plastic bags, floors, mats, et cetera.

18 The motion from the subcommittee on  
19 container production reads as a motion that  
20 container production, to be certified organic, a  
21 limit of 20 percent of the plant's nitrogen  
22 requirements can be supplied by liquid feeding

1 and a limit of 50 percent of the plant's nitrogen  
2 requirements can be added to the container after  
3 the crop has been planted.

4 For perennials, the nitrogen feeding  
5 limit is calculated on an annual basis.

6 Transplants, ornamentals, herbs, spouts, fodder,  
7 and aquatic plants are exempted from these  
8 requirements. The motion was made by Francis and  
9 seconded by Steve.

10 A yes vote on this is to pass this  
11 proposal and define container production as such.

12 A no vote is to reject the proposal.

13 The voting will start with Sue.

14 MS. BAIRD: No.

15 MS. BEHAR: Yes.

16 MS. OAKLEY: Yes, only because I  
17 worked on this compromise.

18 DR. THICKE: Yes.

19 MS. BRIONES: No.

20 MS. DE LIMA: No.

21 MR. BRADMAN: No.

22 MS. MOSSO: No.

1 MR. ELA: Yes.

2 MR. MORTENSEN: Yes.

3 MR. BUIE: Yes.

4 MS. SWAFFAR: No.

5 DR. SEITZ: Yes.

6 MR. RICE: No.

7 MR. CHAPMAN: The Chair votes no.

8 Seven yes, eight no. The motion fails.

9 DR. THICKE: So next we have the  
10 motion on hydroponics. Proceed to the vote.

11 MR. CHAPMAN: Okay. Go ahead.

12 MS. BEHAR: So this is roots in water,  
13 correct?

14 MR. CHAPMAN: The --

15 MS. BEHAR: Not necessarily.

16 MR. CHAPMAN: The definition in this  
17 proposal, hydroponics, for the purposes of this  
18 proposal, any container production system that  
19 does not meet the standard of limit of 20 percent  
20 of the plant's nitrogen requirement being  
21 supplied by liquid feeding, and a limit of 50  
22 percent of the plant's nitrogen requirement being

1 added to the container after the crop has been  
2 planted.

3 MS. BEHAR: Okay.

4 MR. CHAPMAN: Okay. So the motion is  
5 -- motion that any container production system  
6 that does not meet the standard of a limit of 20  
7 percent of the plant's nitrogen requirement being  
8 supplied by liquid feeding, and a limit of 50  
9 percent of the plant's nitrogen requirement being  
10 added to the container after the crop has been  
11 planted is defined as hydroponic and should not  
12 be allowed as certified organic.

13 For perennials, the nitrogen feeding  
14 limit is calculated on an annual basis.  
15 Transplants, ornamentals, herbs, sprouts, fodder,  
16 aquatic plants are exempt from these  
17 requirements. The motion was made by Jesse and  
18 seconded by Dave.

19 A yes vote on this motion is accept  
20 this proposal. A no vote is to reject it.

21 The voting will start with Harriet.

22 MS. BEHAR: Yes.

1 MS. OAKLEY: Yes.

2 DR. THICKE: Yes.

3 MS. BRIONES: No.

4 MS. DE LIMA: No.

5 MR. BRADMAN: No.

6 MS. MOSSO: No.

7 MR. ELA: Yes.

8 MR. MORTENSEN: Yes.

9 MR. BUIE: Yes.

10 MS. SWAFFAR: No.

11 DR. SEITZ: Yes.

12 MR. RICE: No.

13 MS. BAIRD: No.

14 MR. CHAPMAN: The Chair votes no.

15 Seven yes, eight no. The motion fails.

16 DR. THICKE: Tom, do you want to go on  
17 today, or do you want to wait?

18 MR. CHAPMAN: I would propose that we  
19 table this last item and we take it up first  
20 thing in the morning. Harriet and Francis, are  
21 you okay with that? Okay.

22 With that, we will recess until

1 tomorrow. Tomorrow our day starts at 8:30, and  
2 we will be starting with the Crops Subcommittee,  
3 continuing with CACS, and then proceeding with  
4 the agenda as listed.

5 We are now in recess.

6 (Whereupon, the above-entitled matter  
7 went off the record at 6:43 p.m.)  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22

<b>A</b>	
<b>A-Dae</b> 1:14 324:18 325:11 370:2 395:2 513:4 515:15	430:13 433:14 454:6
<b>a.k.a</b> 194:6	<b>accepted</b> 190:2
<b>a.m</b> 1:9 5:2	<b>accepting</b> 15:2 105:3
<b>abbreviated</b> 254:20	<b>accepts</b> 289:19
<b>Abby</b> 3:16 116:10 121:13,14,17 126:4	<b>access</b> 31:8,11 150:21 318:15 445:18 447:3 456:18 482:12 500:9 506:16
<b>abdicated</b> 26:6	<b>accessibility</b> 143:22 447:1
<b>abide</b> 487:8	<b>accommodate</b> 120:12 120:15
<b>ability</b> 9:20 92:2,3 105:14 169:10,17 195:17 205:16 440:18 446:22 456:19 523:10	<b>accompanying</b> 316:2 447:13
<b>able</b> 23:22 24:18 25:8 31:14 165:10 214:16 228:5 256:19 259:2 269:9,10 289:13 293:16,17,20 297:18 311:10 315:22 404:18 408:17 415:10 431:22 445:8 487:8 527:18 533:17	<b>accomplish</b> 231:20
<b>above-entitled</b> 282:10 419:6 542:6	<b>accomplished</b> 168:22 457:8
<b>abridging</b> 316:9,21	<b>accord</b> 200:18
<b>abroad</b> 313:22 315:7	<b>account</b> 500:16
<b>absence</b> 140:20 361:20 413:15 505:15	<b>accountable</b> 122:22 267:9
<b>absent</b> 313:4 337:22 342:10 350:1 356:10 359:4 372:12	<b>accounted</b> 508:20
<b>absolutely</b> 15:5 208:7 209:12 236:6 279:17 486:7	<b>accounts</b> 105:8
<b>absolved</b> 90:8	<b>accreditation</b> 4:2 119:10 122:12
<b>absorption</b> 159:20 160:1 274:12	<b>Accredited</b> 2:14 265:14 420:19
<b>abstain</b> 334:21 349:6 349:22 532:1	<b>accrued</b> 206:10
<b>abstention</b> 335:5 532:8	<b>accumulate</b> 435:14,15
<b>abundantly</b> 36:21	<b>accumulated</b> 276:20 277:22
<b>abuse</b> 145:3	<b>accumulation</b> 38:3 347:9,14 435:11
<b>AC21</b> 38:14	<b>accurate</b> 35:8,17 135:3 135:6 338:7
<b>ACA</b> 265:20 266:11 267:18 268:12,19 420:19	<b>accurately</b> 58:19
<b>Acadian</b> 2:18 133:16 137:18	<b>acetic</b> 333:21,21 401:18
<b>acaricides</b> 340:21 343:8 344:15	<b>achieve</b> 51:5,14 59:13 83:16 164:7,14 169:16 172:17 207:15
<b>ACAs</b> 268:4	<b>achieved</b> 59:2 451:22
<b>accept</b> 32:10 55:3 141:12 209:4 216:20 255:2 301:7 533:5 536:5 540:19	<b>acid</b> 4:10 102:4 154:22 155:8 170:12 180:1 196:18 197:22 198:10 198:13 222:20 231:4 256:12 272:8 328:18 333:21,21 340:18,22 341:6,12 342:12 343:7,8 378:1
<b>acceptable</b> 35:12 337:7	<b>acid-based</b> 330:16
	<b>acids</b> 4:12 221:20 222:4 222:5,10,11,17,19,21 328:19 351:7,11,18 353:5 401:18,18
	<b>acknowledge</b> 8:21 50:4
	<b>acquiesce</b> 379:10
	<b>acquire</b> 250:2
	<b>acre</b> 63:22 276:9 435:13,14 439:15
	<b>acreage</b> 144:12
	<b>acreages</b> 460:7,7
	<b>acres</b> 210:17 244:20 269:3 270:22 285:3,5 312:21 390:19 393:3 393:17 421:14 460:14 460:20 461:1,4 475:18
	<b>act</b> 7:8 89:10 207:12 219:17 271:13 278:21 321:19 366:7 403:13 458:14 464:16 470:8 473:7,16
	<b>acted</b> 293:13
	<b>actinomyocetes</b> 447:15
	<b>action</b> 41:5 101:6 106:4 141:4 192:12 197:19 208:20 361:19 380:21 478:1
	<b>actions</b> 127:12 256:2
	<b>active</b> 45:17 124:11 190:20 191:5 458:22
	<b>actively</b> 46:21 47:8,15
	<b>actives</b> 46:1
	<b>activities</b> 268:11 468:19 473:10
	<b>activity</b> 190:16 197:20 223:15 249:7 394:3 438:5 448:11 468:21
	<b>actual</b> 449:15 530:14
	<b>adapt</b> 117:11 234:2 284:14 432:1
	<b>adapted</b> 422:3
	<b>adapting</b> 232:15
	<b>add</b> 8:20 13:20 27:2 69:19 72:2 100:15 106:2 129:7 139:1 141:13 148:1 187:15 188:2 226:14 227:15 380:22 382:6 392:3 397:21 398:1,5,6 411:19 417:11,13
	<b>added</b> 116:21 142:2 147:12 166:18 205:11 392:7 400:21 413:1 431:4,6 433:19 435:3 441:7 454:2 502:11 538:2 540:1,10
	<b>addendum</b> 374:12,14
	<b>adding</b> 147:9 227:13 492:11
	<b>addition</b> 170:11 182:17 196:21 221:21 222:21 241:22 371:22 374:16 400:7 403:5 443:8,14 450:4,16,19 453:12 453:15 454:1
	<b>additional</b> 57:19,22 118:20 119:7 120:22 143:4 145:17 152:6 192:12 255:13,14 261:12 268:6,10 363:9 379:9,18 384:3 392:7,18 402:1 404:2 421:7 446:7 452:2,7
	<b>Additionally</b> 109:15 361:15 362:3 363:9 407:16 489:19
	<b>additions</b> 255:2
	<b>additives</b> 159:4,6 168:2 168:13
	<b>address</b> 54:5 100:10 142:18 147:4 168:9 191:6 196:15 197:19 205:15 210:18 216:1 265:18 280:19 355:4 399:9 410:12 422:16 445:15 446:10,22 448:1,9 452:21 453:2 454:6 473:22 508:3
	<b>addressed</b> 41:19 148:3 152:19 157:10 267:4 314:1 318:10 408:16 450:22
	<b>addresses</b> 37:14 39:4
	<b>addressing</b> 108:6 122:5 131:21 139:6 152:3 163:22 265:15 445:20 511:17
	<b>adds</b> 104:9
	<b>adequate</b> 41:12 385:1 432:4
	<b>adhere</b> 54:18 136:9,10 285:18 508:9
	<b>adheres</b> 137:5
	<b>adjacent</b> 206:16
	<b>Adjourn</b> 4:22
	<b>adjusting</b> 479:22
	<b>administered</b> 160:8
	<b>administration</b> 153:16
	<b>Administrator</b> 2:6 99:11
	<b>admitted</b> 240:16
	<b>adopted</b> 81:10
	<b>adoption</b> 403:12
	<b>advance</b> 6:3
	<b>advancement</b> 250:7
	<b>advances</b> 233:9
	<b>advantage</b> 173:7 377:14
	<b>advantages</b> 205:6
	<b>adverse</b> 389:5 404:9
	<b>advised</b> 156:20
	<b>advisement</b> 342:22
	<b>advisory</b> 2:1 57:5 111:5

341:3  
**advocacy** 107:19 108:1  
 130:5  
**advocate** 24:8 111:2  
 117:19 331:3 513:15  
**advocated** 17:13  
 513:10  
**advocating** 432:4  
**aerial** 314:10  
**aero** 493:7  
**aerobic** 404:21 405:4  
 405:19,22  
**aerobically** 405:11  
**aeroponic** 97:13 103:7  
 140:22 432:16 529:3  
 530:18,22  
**aeroponics** 20:1 58:5  
 84:2,4,9 313:8 432:11  
 450:16,18 529:2  
 530:10,17 531:7,10  
 533:17 534:2,22  
 535:5  
**Aeroponics/Hydroponics**  
 4:19  
**Affairs** 133:16 254:4  
**AFFCO** 305:7 311:20  
**affect** 167:9 170:14  
 394:20 499:7  
**affective** 172:16  
**affidavits** 365:3  
**affiliate** 100:6  
**Affiliated** 3:11 283:3,8  
**affiliation** 6:5 8:1 18:9  
 36:1 40:6 49:19 57:1  
 81:1 93:12 99:8  
 121:15 126:7 129:21  
 133:11 142:12 146:22  
 149:21 154:5 177:1  
 179:12 182:5 189:11  
 196:5 200:3 204:21  
 221:2 225:5 240:8  
 248:12 265:12 273:5  
 282:18 312:9 315:17  
**affiliations** 6:8  
**afford** 150:12 475:16,17  
**afforded** 208:11  
**affords** 70:11  
**afternoon** 7:5 254:1  
 283:1 291:10 302:14  
 312:10  
**Ag** 2:17 291:11 374:15  
**ag's** 511:17  
**agar-agar** 107:7  
**age** 304:15  
**agencies** 38:12 170:18  
**Agency** 210:9  
**agenda** 41:18 42:7  
 43:15,22 108:3 131:8

139:3,9 142:2,16  
 147:11,13 148:2  
 257:12 282:5 320:14  
 323:17 372:6 403:18  
 418:20 419:2,4  
 420:10 526:18 528:4  
 542:4  
**ages** 69:11 456:19  
**ago** 27:12 40:14 69:9  
 215:2 235:5,6 391:7  
 475:2 512:1  
**agree** 30:7 64:14 114:8  
 123:7 124:19 139:16  
 197:22 212:19 219:2  
 377:9,12 379:3,8,15  
 379:16 424:22 468:4  
 474:10 495:17 510:11  
 524:10 526:14  
**agreed** 72:8 232:1  
 300:3 371:9 446:9  
 476:14 480:16 487:6  
**agreement** 245:2  
 395:21 467:7  
**agrees** 60:1 116:19  
 265:20  
**agricultural** 2:19  
 143:13 198:3 221:6  
 256:13 371:14 407:15  
 413:17 460:16 495:8  
 500:6  
**agriculturally** 290:7  
**agriculture** 1:1 38:8  
 124:14 144:16 221:9  
 243:19 283:18 286:3  
 286:4 289:6 363:12  
 366:9 376:1 382:16  
 394:11,13,18 407:2  
 414:11 457:18 460:1  
 465:1 467:18 470:9  
 485:11,17 486:5  
 496:2,8,14 508:2,11  
**Agriculture's** 57:5  
**agro** 256:6  
**agro-** 37:20  
**agrochemical** 110:7,20  
**agroinfiltration** 123:3  
**agronomic** 446:10  
**agronomist** 312:20  
**ahead** 60:7 108:22  
 139:19 257:6 259:8  
 283:22 328:6 351:16  
 374:6 376:9 378:12  
 381:10 394:12 430:20  
 502:11 521:16 528:9  
 539:11  
**aid** 111:17 147:16  
 166:13 191:9 206:18  
**aides** 159:22

**aids** 166:15,16 167:7  
**air** 173:8 432:13 531:12  
**Alan** 512:4  
**Albert** 252:12  
**Albuquerque** 36:4,13  
**alcohol** 247:6 296:8  
 375:11,13 394:21  
**alcohols** 4:17 241:4  
 246:12 291:13 292:1  
 297:3 301:13 374:4,9  
 374:17 375:6,7,17,19  
 385:13 392:4 396:19  
 398:1  
**Aldo** 145:2  
**alert** 258:20 259:11  
**algae** 42:22 105:11  
 133:19 134:17 448:21  
 516:1,16  
**algaecide** 321:12  
**algicide** 271:16  
**align** 92:19  
**aligned** 32:11 94:1  
**alike** 488:20  
**aliphatic** 375:7  
**alive** 174:10  
**alkali** 351:12  
**Alliance** 2:12,19,20  
 18:12 107:20 113:4  
 130:2 198:21 199:1  
 199:18 420:21  
**allow** 44:15 48:11 84:3  
 148:6 191:12 201:12  
 201:18 202:1 219:7  
 266:9 270:6 310:17  
 417:18 445:17 476:4  
 505:11,12 524:6  
 535:6  
**allowance** 227:17  
 269:11 421:22 443:6  
**allowances** 150:22  
**allowed** 6:13 20:4,5,14  
 28:2,5 31:1 32:5 33:1  
 34:12 42:9 44:17  
 45:17 50:9,19 51:19  
 60:2 61:19 67:6,7  
 94:10 105:1 106:7,17  
 148:19 155:22 157:2  
 163:3 191:19 208:7  
 231:2 301:8,14  
 321:10 354:12 358:6  
 371:13 384:1 401:4  
 403:10 411:10 422:19  
 431:2 432:5 441:9  
 447:6 456:14 472:15  
 482:10,11,12 487:15  
 491:6 505:3 515:5  
 517:21 540:12  
**allowing** 8:3 24:3 29:21

30:8 119:3 154:9  
 257:16 316:21 355:20  
 447:3 505:2,3 517:20  
**allows** 123:11 165:1  
 213:20 224:1 507:19  
 507:20  
**Almanac** 145:3  
**aloe** 250:22  
**Aloha** 154:3  
**alongside** 56:11  
**altered** 214:3  
**altering** 394:20  
**alternately** 452:20  
**alternative** 56:9,10  
 162:10 193:21 223:6  
 230:22 261:2 306:10  
 337:1 348:9,12 362:2  
 390:6 406:9,19  
 429:17 445:2 479:5  
 510:14 511:19  
**Alternatively** 110:11  
**alternatives** 160:19,22  
 170:22 257:2 259:14  
 382:12 387:8,11  
 390:3 406:3 525:11  
**altogether** 460:22  
**amazed** 46:17  
**amazing** 127:5 196:8  
 478:2  
**amenable** 209:9  
**amend** 417:9  
**amended** 473:2  
**amending** 107:9 232:14  
**amendment** 316:6,15  
 371:20 400:4,7  
 451:12  
**amendments** 29:2  
 351:10 354:9 358:3  
 360:22  
**America** 79:7 188:19  
 302:18  
**American** 150:2 243:5  
 276:9 493:2  
**amidated** 180:11  
 182:20 183:2,4,5,6  
 186:12,17  
**amidation** 187:11  
**ammonia** 150:21 207:3  
**ammonium** 222:4,12,22  
**amount** 11:1 86:7,15  
 103:19 114:9 135:4  
 135:17,20 137:10  
 169:21 228:13 257:19  
 269:4 271:2 277:17  
 283:6 286:15 480:14  
 503:6,10  
**amounting** 270:22  
**amounts** 50:19 63:4

194:13 284:20  
**amphibians** 345:8  
**AMS** 211:8 429:21,22  
 430:4  
**anaerobic** 4:18 104:15  
 399:18,22 401:3,8,19  
 402:12 403:3,5 404:2  
 404:11,14,16,19  
 405:3,10,17 406:2,11  
 406:18 407:8 408:14  
 410:11,16,19 415:3  
 416:1 417:12,14,18  
 420:5  
**analogous** 221:22  
**analyses** 405:7  
**analysis** 91:18  
**analyzed** 157:13  
**anaphylaxis** 251:3  
**ancestral** 513:7  
**anchor** 10:16  
**and/or** 147:16 295:2  
**Andaluz** 2:8 18:7 36:2,3  
 40:2  
**Anderson** 2:8 172:20  
 177:3,4 178:21  
 244:20  
**Andreas** 3:3 269:17  
 273:3,4,6  
**Andy** 2:19 210:7 220:22  
 221:1,4  
**anecdotal** 16:10 65:9  
**angering** 53:7  
**animal** 104:16 150:1,13  
 150:16 152:13 190:22  
 206:14 248:16 252:5  
 372:1 401:8 402:6  
 405:2 409:10 414:21  
 432:22 465:9  
**animals** 10:10 37:9  
 56:14 94:4 150:3  
 152:16 153:5,22  
 224:8 252:7 329:6  
 433:5 473:12 532:17  
 532:21  
**Anja** 2:8 172:20 176:21  
 176:22 177:3  
**Anja's** 183:2  
**annotating** 107:6  
**annotation** 100:12,16  
 101:5 165:17 224:1  
 263:2 301:13 336:20  
 337:2,8,8,18 341:22  
 342:4 345:14 355:12  
 381:7  
**annotations** 348:7  
**annual** 115:17 122:15  
 135:15 207:18 355:21  
 431:8 433:22 441:12

538:5 540:14  
**annually** 269:13  
**Annville** 225:9  
**answer** 6:21 18:2 35:4  
 45:3 61:8 65:11 166:2  
 237:3 239:14 240:22  
 297:14,15 314:5,16  
 390:8 395:9,10 420:3  
 535:14  
**answered** 336:5 400:22  
 535:12,13  
**answering** 96:15 464:4  
 525:3  
**answers** 6:20 140:4  
 290:9 338:21  
**ant** 155:9  
**anti-smoker** 246:16  
**anti-soil** 506:18  
**antibiotic** 104:16  
**anticipate** 146:2 172:6  
**antithetical** 32:11  
 387:12  
**antithetically** 388:17  
**ants** 155:9 341:10,17  
**anybody** 157:13 188:5  
 265:3 286:8 330:7,9  
 334:3 425:21 441:17  
 521:17 528:18 535:9  
 537:7  
**anyone's** 292:7  
**anyway** 29:19 46:14  
 233:22 299:20 384:10  
 486:21 516:5 522:10  
**apart** 68:4 409:3  
**APHIS** 212:7  
**appalled** 32:4,15  
**appalling** 33:13  
**apparent** 169:13 407:11  
**apparently** 60:1 85:14  
 308:16 430:8  
**appear** 59:22 160:14  
 166:8 263:13  
**appearance** 191:13,14  
 425:3  
**appears** 29:18 56:10  
 103:20 134:16  
**applaud** 425:4  
**applauded** 50:12  
**Applause** 494:20 526:9  
**apple** 177:17 179:20  
 271:1  
**apples** 269:22 270:19  
 270:21 369:12 393:16  
 393:17  
**applicability** 146:9  
**applicable** 89:16,16,17  
 140:20 233:5 267:11  
 328:10 335:13 366:8

451:2,15 453:7  
 488:17 489:1  
**application** 37:19 146:8  
 165:22 184:15 223:13  
 223:18 355:9,20  
 401:6 406:22 407:19  
 411:12  
**applications** 162:9  
 168:11,15 181:21  
 206:5 361:12,22  
 394:13 409:13  
**applied** 52:12,22  
 103:19 104:13,19  
 152:16 161:14 223:2  
 266:13 321:17 390:5  
 390:6 410:1 413:3  
 434:7 503:13  
**apply** 132:14 329:18  
 342:20 407:20  
**applying** 106:19 136:20  
 268:2  
**appointed** 492:21  
**appreciate** 8:10 101:12  
 103:1 118:18 120:18  
 121:20 141:1,22  
 142:5 143:1 146:6  
 189:19 193:10 195:22  
 201:1 220:11 237:5  
 260:1,3 293:11  
 306:11 442:8 456:2  
**appreciated** 226:7  
 419:20,22  
**appreciates** 133:21  
 147:8  
**appreciating** 121:3  
**approach** 11:3 14:6  
 54:1 137:14 150:9  
 151:17,21 492:20  
 504:14 511:15  
**approaches** 51:5,6  
 106:16 485:16 511:20  
**approaching** 26:15  
**appropriate** 50:10 60:3  
 61:13 110:22 112:17  
 113:1 190:10 203:3  
 218:10 263:3 382:10  
 408:13 411:15,17  
 413:13 505:9  
**appropriately** 331:8  
**approval** 155:4 300:15  
 305:10 310:12 311:8  
 337:2 408:13 457:2  
**approve** 13:9,10,13  
 301:10 417:19  
**approved** 43:18 109:12  
 182:19 223:12 228:21  
 249:2,5,21 251:18  
 296:20 297:5 298:11

298:15 299:1 300:7  
 302:3 305:7,9 338:9  
 358:21 375:16 378:16  
 378:18 392:17 395:13  
 395:17 456:22 465:19  
 465:21 468:3,6  
 520:20  
**approves** 392:19  
**approximately** 135:13  
 135:17 172:16 254:8  
 254:13  
**April** 159:18 184:22  
 400:3 497:8  
**aquaponic** 9:18 97:13  
**aquaponics** 103:8 120:7 140:22  
 200:10 201:14,19  
 202:6,10 203:2 204:4  
 204:13 205:21 209:5  
 209:7 429:8,16  
 431:10 433:9 461:16  
 462:9 533:2 535:21  
 536:1  
**aquaponically** 85:12,22  
 209:12  
**aquaponics** 20:1 24:14  
 39:17 200:8 201:8  
 203:10 205:2,5,16  
 206:4 207:14,15  
 208:5 313:9 428:19  
 432:19 456:12 462:7  
 462:13 476:4 490:11  
 493:7 502:15 532:11  
 532:12,14 533:6  
**aquatic** 224:4,8 329:5  
 432:22 433:5 434:2  
 441:14 473:12 532:17  
 532:21 538:7 540:16  
**aquiculture** 57:7  
**arable** 447:1  
**arbitrary** 59:9 81:15  
 135:5 191:7 488:4  
**Arcadian** 133:21  
 134:22  
**area** 115:2 132:15  
 137:15 184:16 238:5  
 249:20 253:2 276:12  
 391:4,14 433:12  
 467:9 469:1 519:7  
**areas** 9:21 114:21  
 138:2 147:14 150:21  
 155:3 188:21 199:10  
 221:13 223:7,14  
 227:8 250:5 288:21  
 345:5 420:22 447:2,2  
 456:20 524:17  
**arenas** 510:1  
**argue** 59:21 497:13  
 518:10,11

**argued** 35:5 80:7  
 317:19 513:11  
**arguing** 514:21  
**argument** 60:21 157:14  
 317:15 383:4 415:2  
 457:14 498:11 499:9  
 513:20 514:15 515:6  
**arguments** 68:5 124:21  
 127:16 318:3 388:2  
 514:6 518:6  
**arises** 41:8  
**Arizona** 86:12 498:7  
**Arkansas** 309:8 474:15  
**army** 174:5  
**arose** 232:17  
**ARSENAULT** 2:1  
**article** 210:11 211:15  
 211:21 215:8  
**articles** 55:20 162:2  
**articulated** 115:21  
**articulating** 113:8  
**artificial** 176:6 440:20  
 478:15 527:19  
**Asa** 1:14 13:5 25:11  
 71:17 86:3,4 88:13  
 91:4 119:19 120:2  
 124:16 146:17 176:18  
 203:21 234:16 238:8  
 276:5 286:1 287:16  
 327:7 351:16 352:17  
 353:2 378:9,11 381:4  
 385:14 506:9 510:8  
 510:10 511:21 516:12  
 521:21  
**Asa's** 121:3 237:11  
**ascophyllum** 134:18  
 135:4,13,15 136:6,14  
 137:4 138:5  
**Ashby** 2:9 282:3 312:7  
 315:13,18,18 319:2,9  
 320:10  
**Ashley** 1:12 62:14 86:3  
 87:12 208:13 219:13  
 229:5 294:13,14  
 297:11 306:5 319:5  
 331:10 349:7 352:14  
 377:11 393:4 424:10  
 426:9 490:17 492:17  
 528:7  
**Ashley's** 393:14  
**aside** 11:6 90:6  
**asked** 29:16 32:18  
 33:17 43:14,21 44:20  
 64:19 69:18 71:4  
 165:3 209:1 234:18  
 235:9,13 299:5,9  
 336:4 391:18 408:5  
 429:7 434:21 445:5

447:21 448:3 460:16  
 469:10 479:13  
**asking** 6:4 17:7,11  
 44:19 61:4 94:14  
 124:17 211:2 230:18  
 260:1 301:4 313:11  
 378:3 443:20  
**ASPCA** 3:6 150:2 152:7  
**aspects** 151:20 527:15  
**assault** 514:2  
**assemble** 316:11  
**assert** 403:21  
**assertion** 190:19  
**assess** 143:15  
**assessed** 269:12,13  
**assessment** 30:8  
 118:10 143:20 403:14  
 403:16  
**assessments** 384:6  
**assigned** 28:9  
**assimilate** 482:2  
**assist** 266:18  
**assists** 194:9  
**associate** 2:5 99:10  
 202:3,4 505:6  
**associated** 45:19  
 388:21,21 411:4  
 413:8 537:12  
**association** 2:9,14 3:2  
 3:4,5,15 8:7 36:7  
 79:16 93:15 100:14  
 138:15 159:5 167:5  
 168:4 177:5,8 178:19  
 193:6 254:5 260:16  
 265:15 420:19  
**Association's** 260:4,7  
 268:9  
**assume** 38:17 43:18  
**assuming** 43:17 276:12  
 276:15,22 277:1  
 407:22  
**assumptions** 436:2  
**assurance** 122:21  
 211:9 227:19  
**assuring** 103:3 106:6  
**asterisk** 15:20  
**astringent** 93:20  
**Atlantic** 137:18,21  
**atmosphere** 497:3  
**attached** 484:9  
**attaching** 493:12  
**attachment** 514:6  
**attacks** 6:14  
**Attapulgitte** 102:1  
**attempt** 25:19 39:8  
 446:1 454:4 494:15  
**attempted** 266:11  
**attempts** 215:2 348:9

448:7  
**attendance** 46:21  
**attended** 67:19  
**attention** 122:11 130:8  
 259:12,12 314:2  
 359:10 421:21  
**attest** 365:3 379:6  
**attorney** 200:7  
**ATTRA** 306:16  
**attract** 345:9  
**attraction** 477:20  
**attributable** 163:6  
**audience** 188:6 377:15  
**audit** 122:14,15 268:3  
 318:17  
**auditors** 192:13,17  
**Aurora** 314:3,6 315:6  
**authorities** 159:12  
**authority** 413:12 515:1  
**authority's** 408:13  
**availabilities** 532:18  
**availability** 100:16  
 143:21 249:19 433:1  
**available** 105:19 132:10  
 132:10,21 139:19  
 162:11 177:12 178:9  
 178:10 179:7 186:5  
 201:4 232:16 250:1  
 262:3,11 280:18  
 285:8 304:22 306:19  
 307:19 311:21 361:10  
 362:9,18 363:4 364:4  
 372:8 380:17 400:14  
 422:2 437:20 475:6  
**avenues** 104:20  
**average** 173:12 436:2  
 491:11  
**avoid** 55:19,22 224:14  
 514:5  
**avoiding** 452:18 482:18  
 482:18  
**await** 150:12  
**awaiting** 41:5 156:15  
 403:15  
**aware** 26:22 38:13  
 136:13 160:12 165:12  
 185:5 278:11 463:8  
**awesome** 415:18

---

**B**


---

**b** 1:8 328:8 335:11  
 451:3  
**B1** 4:15 117:1 357:16  
 360:15 361:1,7,12,17  
 361:22 362:2,4 364:1  
 366:5  
**back** 7:20,21 32:3,6,19  
 33:12 34:19 52:6,14  
 59:10 62:16 74:19  
 76:6,10 94:7 125:13  
 125:19 129:5 131:8  
 133:3,4 140:9 145:17  
 149:11 152:21 158:7  
 158:17 188:17 217:3  
 217:12 223:17 231:19  
 236:4 245:20 251:15  
 255:12 278:10 282:8  
 283:21 287:21 288:20  
 294:16,22 295:1,11  
 298:10,12,16 299:2  
 300:8,12 306:15  
 376:4,21 377:4 378:4  
 378:21 379:22 380:20  
 381:15,15 383:21  
 384:3,7,10,19 385:11  
 385:12,15 412:15  
 418:19 419:4,11,12  
 423:6,11,21 424:8  
 426:3,9 427:9 428:21  
 433:5 440:11,14  
 472:9 474:1,5 478:20  
 499:3 500:15 522:13  
 524:17 532:21  
**backbone** 280:7  
**backed** 190:21  
**background** 23:6 246:2  
 502:3  
**backgrounds** 232:2  
**backup** 431:3  
**backwards** 429:4  
**bacteria** 37:7 174:11  
 207:2 249:16 275:6  
 401:15,17 431:19  
 433:1 438:10 447:15  
 448:21,22 449:4  
 452:12 499:12 515:21  
 516:14 532:18  
**bad** 114:12 306:21  
 425:11 493:18  
**Badger** 2:10 142:10  
 146:18,20 147:1,2  
 149:18  
**bags** 537:17  
**Baird** 1:13 28:13 29:3,7  
 29:9,14 31:4 76:6,9  
 76:13 86:6,18,22 87:4  
 87:8,11 215:20  
 217:14 309:5,8  
 325:22 326:20 327:17  
 328:17 333:3 334:8  
 334:19 339:22 343:22  
 346:7 349:11 350:14  
 353:11 356:21 360:11  
 365:20 367:6 368:8  
 370:13 373:11 386:4  
 397:10 398:15 414:19

- 416:16 418:6 424:22  
425:19 426:14 470:13  
524:20 526:1,6,10  
531:17 536:9 538:14  
541:13  
**bait** 95:17 342:1  
**bake** 181:8  
**baked** 36:17 102:5  
**bakery** 162:8 181:8  
**balance** 10:12 16:15  
54:22 100:1 136:12  
140:14 276:4  
**balanced** 117:21  
**balances** 116:5 118:17  
**balancing** 306:22  
309:22 310:4  
**ball** 437:5  
**Ballrooms** 1:8  
**ban** 491:19  
**BANDERA** 2:10  
**banks** 466:15  
**bar** 105:4  
**barefoot** 471:7  
**barking** 319:2  
**barriers** 178:20 328:10  
335:12  
**Bart** 312:19  
**Barton** 2:11 133:10  
138:11,13,14 141:10  
141:18 142:5  
**base** 12:22 122:21  
278:4 330:21 482:7  
**based** 9:4 10:15 11:8  
15:15 16:9 50:18 52:9  
52:12,15 54:1 75:10  
79:1 94:16 104:3  
105:6 117:18 118:4,6  
128:9 131:6 134:3  
137:18 170:12 184:11  
198:4 205:17 210:19  
221:9 256:4,21  
258:15 262:20 271:4  
278:2,5,13,16 279:6,9  
279:10,14,21 280:1  
280:10,10,11,12,16  
280:17 283:3 305:1  
343:10 366:5 382:7  
383:2 410:12 411:4  
428:15 429:5,21  
435:7,12 445:1,13  
486:5,12,22  
**basement** 499:21  
**BASF** 3:3 273:7  
**basic** 16:21 151:12,14  
187:5 284:22 383:12  
**basically** 46:10 80:3  
84:3 91:20 127:7  
171:15 185:18 253:10  
358:15 395:15 429:11  
434:5 435:4 436:1,12  
469:17 500:7 528:17  
529:17  
**basics** 183:10  
**basil** 74:12,12,14,14  
173:4 174:9 192:4  
**basis** 33:5 63:8 215:11  
276:8 296:2 305:1  
431:8 433:22 441:12  
457:1 512:3 534:6  
538:5 540:14  
**Bat** 466:21  
**bathe** 498:16  
**bathed** 450:4 499:2  
**bay** 10:19 258:10  
260:22 261:20 262:22  
**beans** 125:3  
**bear** 316:18  
**bears** 129:5,6  
**beat** 216:17  
**beautiful** 477:5  
**beauty** 304:9 308:11  
505:1  
**bed** 200:13  
**beds** 201:18 202:17  
478:16  
**bee** 155:1  
**beekeeper** 36:8  
**beer** 240:19 244:3,9,11  
247:16 248:3 309:1  
**bees** 155:2,3 224:21  
**beet** 179:20  
**beetles** 310:7  
**began** 156:11  
**beginning** 17:14 31:8  
35:10 203:4 437:8  
456:18 473:21 488:8  
**behalf** 50:2 147:3 150:4  
189:13 193:5 221:15  
272:13 315:19 442:4  
**behavior** 394:21  
**behaviors** 514:18  
**belated** 316:5  
**belief** 127:16,17,18  
234:13 382:9 462:1  
**beliefs** 127:14  
**believe** 20:15 30:9 52:6  
57:18 72:5 73:6 79:1  
79:1 83:1,7 84:1  
112:19 116:3,4 118:9  
130:18 137:2,4 191:4  
197:13,17 207:15  
225:18 227:14 229:17  
241:5 255:16 256:5  
256:22 259:17 312:14  
352:12 354:18 369:12  
387:1 410:4,9 462:8  
493:15 500:18 501:22  
502:6,8,9,16,18  
503:20 529:15 537:10  
**believed** 72:2 259:19  
**believes** 83:14 119:3  
140:17 192:9  
**believing** 96:8  
**Bellevue** 240:11  
**Bellingham** 212:9  
218:15  
**belong** 145:5  
**belonging** 145:4  
**belongs** 39:15  
**beneath** 15:20 537:15  
**beneficial** 311:22  
447:17 465:11 514:11  
**benefit** 110:9 145:10  
147:19 181:11 205:12  
249:13 511:8  
**benefits** 118:5 197:17  
249:1 456:17 457:21  
468:22 478:4 482:22  
490:20  
**Bensonoff** 2:11 5:5 8:2  
8:4 11:20 12:6 13:11  
13:18 15:6 16:9  
 **bentonite** 126:14  
**Berkeley** 173:1 174:4  
311:6  
**Bermuda** 331:16  
**berries** 283:5 285:5  
**best** 27:11 35:9 90:17  
102:12 107:2 113:19  
114:22 118:8 131:13  
131:18 140:10 146:12  
169:5 178:7 200:17  
202:5 234:12 256:5  
259:7 285:8,13 293:2  
304:4,7,7 308:4  
463:16 502:17  
**better** 14:14 25:7 46:2  
48:8 70:2 81:22  
112:15 129:6 139:15  
139:17 145:7 164:9  
164:11 169:19 170:10  
202:20 239:14,15  
247:18 284:7 289:10  
457:12 469:16 470:4  
471:5 500:10 502:20  
509:6 510:10  
**beverages** 168:19  
181:14,17,18  
**beyond** 2:16 3:11 38:2  
40:8 53:17 105:14  
108:20 151:10 154:8  
207:7 252:16 269:8  
284:22 352:1 378:17  
412:13  
**BHA** 45:9,9  
**BHT** 45:9,9  
**bias** 497:15  
**bible** 37:17  
**bicarbonate** 102:4  
**Biernbaum** 2:12 5:5  
18:7,10,11 21:18 24:9  
26:1 28:20 29:5,8,10  
30:7 31:18 33:16 34:2  
34:7,14  
**bifurcated** 25:15  
443:17  
**bifurcation** 71:20  
**big** 15:19 22:3,4 45:2  
95:12 228:1 243:3  
388:16 414:4 424:13  
439:9 460:5,21  
491:12  
**bigger** 437:11  
**biggest** 114:5 131:22  
186:7 212:15 215:17  
253:1 311:12 320:4  
511:10  
**bill** 219:16,22 253:17  
316:2,5 319:8  
**billion** 41:9 284:17  
505:21  
**bin** 330:21  
**binding** 194:18  
**binds** 194:6  
**bins** 330:16  
**bio** 278:4,13,16 279:6,8  
279:10,14,21 280:10  
280:11,15,17  
**bio-diversity** 238:13  
239:12  
**biobased** 4:10 104:22  
105:1,7 335:8,14  
336:18 337:5 338:10  
339:8  
**biochemistry** 481:22  
**biodegradability** 105:7  
273:10 336:21  
**biodegradable** 4:10  
104:21 105:1 273:8  
273:13,18 274:5,18  
275:4,13 276:2  
277:21 279:20 335:8  
335:13 338:18 339:8  
**biodegrade** 273:13  
274:7  
**biodegraded** 277:18  
**biodegrading** 275:15  
336:10  
**biodiversity** 51:3 59:4  
90:12,21 103:13  
140:15 145:8 453:3  
454:4 467:16 499:16

506:2 515:10  
**biofilm** 251:14,14 277:8  
**biogas** 401:20  
**biological** 10:7 22:15  
 118:11 190:15 192:22  
 206:19 438:5 440:5  
 466:8 467:12 468:8  
**biological/ecological**  
 445:20  
**biologically** 206:22  
 458:22  
**biologists** 105:20  
**biology** 22:20 104:3  
 190:5,10,19 191:5  
 231:15,15 431:18  
 432:5 447:12 516:13  
 516:16  
**biomass** 135:10,22  
 136:7 273:18 274:10  
 274:21 438:8  
**bioponics** 428:20  
 431:17  
**biotechs** 38:10  
**bird** 56:14 229:16  
**birdhouses** 466:21  
**birds** 226:11 227:1  
 230:3 304:12,21  
 310:20 449:7 516:3  
**bit** 13:3 14:22 16:19  
 21:6 25:22 44:12  
 77:11 128:4 242:10  
 244:1,7 245:6 253:12  
 262:7 269:7 279:4,11  
 289:21 300:8 381:13  
 388:11 392:21 393:4  
 399:7 403:3 424:9  
 428:9 476:19 477:1  
**bite** 500:15  
**bits** 120:13  
**black** 169:14 210:22  
 212:10 289:8 304:1  
 304:16 305:3,8,21  
 306:2 308:10 310:21  
 311:16 514:21  
**blackberries** 288:13  
**blame** 31:2  
**blaming** 292:8  
**blatant** 214:2  
**blend** 169:21 375:11  
**blended** 184:1 362:7  
**blight** 271:20  
**block-processed** 195:2  
**blockchain** 219:2  
**blowing** 216:5  
**blows** 215:8  
**blueberries** 50:3 291:1  
**board's** 40:15 525:6  
**boardrooms** 39:2

**boards** 488:8  
**boat** 248:6 378:5  
**Bob** 243:14 244:19,20  
**Bobbe** 2:13 204:19  
 210:6,8,8 213:13  
 214:18 216:2 217:17  
 219:20 220:10,16,21  
**body** 148:14 184:13  
 226:20 411:17  
**bogus** 516:10  
**Bogusz** 2:13 121:13  
 126:5,8,8 129:10  
**boiler** 401:13  
**bold** 15:19  
**Bondera** 149:20 153:20  
 154:3,6,6 157:7,20  
 158:8,11,13,15,18,20  
**booklet** 254:16  
**border** 498:22  
**borders** 51:8  
**boric** 4:10 155:8 340:17  
 340:22 341:6,12  
 342:12 343:7,8  
**Borlaug** 499:22,22  
**born** 37:11 232:22  
**boron** 4:13 354:5,14  
 356:14 358:18  
**botanicals** 102:11  
**bother** 308:12  
**bothers** 425:20  
**bottom** 183:22 331:15  
**bought** 69:10 216:13  
 474:18  
**bowel** 160:4  
**box** 169:12 491:11,12  
**boxed** 172:3  
**boxes** 270:20  
**Bradman** 1:14 13:6,13  
 14:21 25:12 46:5  
 71:18 72:11 73:5,9  
 91:5,15 119:20 120:3  
 124:17 125:6,9  
 203:22 208:22 209:4  
 234:17,21 238:10,17  
 239:9,16,19 252:11  
 276:6,21 277:5,10,13  
 278:1,6 287:17  
 325:14 326:12 327:9  
 335:3 338:14 340:6  
 344:6 346:13 349:16  
 350:20 351:17 353:2  
 353:17 357:5 360:3  
 366:20 367:22 370:5  
 373:3 378:13 384:12  
 385:18 397:16 398:21  
 416:22 418:12 426:20  
 506:10 521:18,22  
 522:3,6,9 532:1

536:15 538:21 541:5  
**brand** 54:11 100:4  
 189:18 314:18 362:3  
**brassicas** 30:16  
**Bravo** 60:5  
**Brazil** 189:2 307:9  
**breadth** 507:4  
**break** 24:4 129:17,18  
 129:19 282:6 373:20  
 374:1 399:4,10  
 418:19 419:5 438:13  
 438:18,20  
**breakdown** 438:16  
 460:13  
**breaking** 281:19  
**breaks** 76:20 253:10  
 254:8  
**bred** 110:6  
**breed** 307:22  
**breeders** 110:11 111:1  
**breeding** 36:10 110:9  
 151:5  
**breeds** 150:20 151:11  
**bridge** 83:11  
**brief** 8:19 77:4 105:18  
 133:2 137:3 250:4  
 487:14  
**briefly** 111:8 124:16  
 133:1 136:17 137:6  
 162:22 217:13 257:15  
 265:18 278:7,8 279:7  
 279:15 286:11 303:20  
 449:19  
**bright** 286:2  
**Brines** 2:2 154:20  
 299:17 300:20 301:2  
 320:22 321:4 328:6  
 335:10 340:19 344:13  
 347:2 351:8 354:7  
 358:1 360:17 365:6  
 365:10 368:18 370:22  
 374:6 395:18,20  
 399:19  
**bring** 47:20 54:15 63:10  
 83:1,9 102:15 152:21  
 216:13,14 294:22  
 295:1 313:20 454:20  
 477:15 490:9 520:9  
 521:20 526:19  
**bringing** 7:20 39:22  
 89:9 306:7 308:20  
 429:5 478:20  
**BRIONES** 1:14 306:6  
 325:12 327:2,21  
 335:1 340:4 344:4  
 346:11 349:15 350:18  
 353:15 357:3 360:1  
 366:18 367:20 370:3

373:15 386:8 395:3  
 397:7,14 398:19  
 416:20 418:10 426:18  
 513:5 531:21 536:13  
 538:19 541:3  
**Brix** 180:20  
**broad** 345:11 362:1  
 381:6  
**broader** 399:9  
**broiler** 303:14  
**broilers** 303:12 305:9  
 312:1  
**broken** 78:3 460:21  
**brokers** 255:18 262:5  
**brought** 203:14 260:4  
 302:22 381:4,15  
 388:13,14,17 422:3  
 444:2 472:10 520:7  
**brown** 352:3 439:22  
**buds** 375:14 382:13  
**buffer** 169:10  
**buffering** 164:6 169:1,6  
 169:8  
**buffers** 172:14  
**bugs** 449:3  
**Buie** 1:12 247:5,11  
 296:7,11 297:4,8  
 299:15,17 325:18  
 326:16 327:13 334:9  
 334:15 339:18 343:18  
 346:3 349:20 351:2  
 353:21 357:9 360:7  
 367:2 368:4 370:9  
 373:7 375:6 381:18  
 382:2 385:22 390:11  
 390:15 397:6 398:11  
 416:12 418:2 427:2  
 492:19 494:8 532:5  
 536:19 539:3 541:9  
**build** 24:11 36:12 95:5  
 127:9 138:17 516:3  
**building** 103:21 148:14  
 328:13 445:22 458:5  
 477:7 478:6,6 490:21  
 515:22 516:8 527:16  
**buildings** 35:15 330:8  
 332:18  
**built** 232:13  
**bulk** 98:9 277:14  
**bullet** 432:3  
**bunch** 218:13  
**bundled** 362:19,22  
 363:1  
**burden** 108:12  
**burdens** 108:19  
**bureau** 38:10  
**buried** 503:11  
**burning** 441:17

**burns** 252:9  
**bushel** 212:13  
**bushels** 211:19  
**busiest** 98:20  
**business** 6:8 7:5 42:10  
 45:20 95:12 210:1  
 218:17 280:15 340:12  
 354:22 385:8 426:4  
 517:1  
**businesses** 116:14,18  
 341:15 371:8  
**busy** 48:16 226:10  
 259:5 295:12 297:12  
 297:17  
**butchered** 18:8  
**butt** 500:15  
**button** 304:20 468:2  
**buy** 69:20 70:8 71:16  
 74:12,13,15 114:9  
 256:20 444:8,10,11  
 474:16,19  
**buyer** 132:4,7 216:18  
**buyers** 132:15 214:8,14  
 216:12 220:1 267:4,6  
**buying** 69:8,16 75:20  
 491:9  
**buzzer** 319:4  
**by-products** 177:20,21  
 179:5  
**byproduct** 304:9  
 307:20

## C

**C** 1:8 4:15 275:7 357:16  
 360:15 361:1,8  
 364:10,16 367:12,14  
**Cabell** 471:16  
**CACS** 141:20 196:15  
 265:18 419:2 542:3  
**CACS's** 57:13  
**cadiron** 222:22  
**CADs** 252:4  
**CAFO-type** 509:12  
**CAFOs** 420:6  
**caking** 306:21  
**Cal** 286:21  
**calcium** 4:8 159:20  
 160:1 170:3 187:16  
 194:5,6,18 270:10  
 271:14 321:1 322:2  
 324:11,13 325:8  
**calculate** 434:21  
**calculated** 433:22  
 441:12 538:5 540:14  
**California** 2:9 76:18  
 78:9,10 80:14 173:2,5  
 283:4 285:4 302:16  
 303:22 310:14,17

363:12 446:14 508:18  
**call** 44:15 60:11,14  
 108:7 135:8 144:13  
 224:19 230:6 234:19  
 300:18 382:20 408:8  
 409:1 442:4 449:20  
 490:1 495:2 518:7  
 529:6,10 530:5  
**called** 42:7 151:1  
 185:14 190:11 227:19  
 230:10 405:21 428:11  
 429:14,15 484:1  
 498:22 529:12 533:11  
**calling** 84:5 200:11  
 354:21 358:19 430:7  
 529:16  
**callouts** 447:1  
**calls** 302:6 379:5  
 381:12 459:18  
**Cameron** 2:18 99:7  
 102:19,22 107:16  
**campaign** 94:7 150:2  
**campus** 311:5  
**Campylobacter** 411:6  
**Canada** 114:11 137:19  
 137:21 305:9 311:22  
**Candy** 2:13 126:9  
**capabilities** 127:13  
**capability** 143:11  
**capable** 275:15 469:9  
**capacity** 164:6 169:6  
**capital** 286:13,16  
**capitalism** 505:12  
**capitalistic** 493:5  
**capitalize** 148:4  
**caps** 103:18 104:2  
 150:22  
**capture** 66:13  
**capturing** 478:19  
**carbon** 62:18,22 63:9,9  
 63:10,11 102:9  
 126:15 173:13 274:1  
 275:1,2,8,10,10,12  
 280:7,10 485:12  
 488:22 489:4,5 496:7  
 496:13 497:1,6,7,15  
 497:17 501:9 508:21  
**carbon-based** 453:13  
**carbonate** 102:6  
**carbonates** 4:13 357:19  
 358:8 359:8  
**carbons** 375:8  
**care** 9:9 235:18 297:1,3  
 315:4 407:13 478:8  
**career** 19:2 283:18  
 286:4  
**careers** 284:9  
**carefully** 14:5 137:1

189:21 482:4  
**cargo** 213:15  
**caring** 226:10  
**Carolina** 293:1 391:3  
 495:5  
**carried** 503:17  
**carrots** 144:8  
**carve-outs** 317:10  
 319:19  
**carved-out** 488:3  
**Cascadian** 243:11  
**case** 273:17 314:7  
 385:15 389:2 408:14  
 425:18 484:21 528:3  
**casein** 194:6  
**cases** 143:11 170:2  
 269:8 287:4 290:10  
 290:15,18 391:6  
 446:19,21 471:21  
 483:2  
**cash** 12:5 292:17  
**cashing** 95:3  
**catalyst** 222:18  
**catapstrophe** 215:18  
**categorically** 143:10  
**categories** 283:7  
**category** 109:20 168:12  
 404:9  
**cats** 248:9  
**caught** 516:21  
**cause** 278:22 322:19,19  
**caustic** 322:17  
**caution** 104:1 134:4  
**cautionary** 502:19  
**cautious** 62:21  
**CCOF** 2:15 3:4 67:16  
 68:10 69:3,10 70:15  
 79:12,16,16,17,17,19  
 81:4,8 82:4 83:14  
 92:16 245:19 318:3  
 481:9 489:11,19  
 492:13 516:22  
**CCOF's** 79:15 316:12  
 515:8  
**celebrate** 506:2  
**celebrated** 60:5  
**celebrates** 513:7  
**celebrating** 225:13  
**cell** 7:16 123:7  
**cells** 498:19,22 499:2,3  
**Cenergy** 400:4  
**center** 2:18 38:8 63:1  
 102:22 250:18 507:11  
**centered** 213:7  
**centers** 58:12,13  
**centimeter** 276:16  
 277:6  
**centimeters** 277:1,2

**central** 273:10 331:16  
**cents** 8:20  
**century** 94:8  
**CEOs** 314:21  
**certain** 81:19 90:9  
 106:18 107:8 126:22  
 159:13 164:7 168:8  
 178:4  
**certainly** 9:6,15 85:4  
 233:17 288:11 301:12  
 332:12 389:14 407:21  
 411:5,10 479:17  
 480:16 484:14 495:9  
 505:18 522 519:2  
 523:21  
**certainty** 14:6  
**certificate** 303:9,15  
**certificates** 219:6  
**certification** 3:7 4:2  
 41:13 55:12 72:16,21  
 79:22 80:5 81:20  
 82:15,18 83:2 89:14  
 103:17 113:17 117:6  
 117:9,19 119:7 122:4  
 130:10 138:19 146:7  
 196:11 197:2,4  
 200:11 201:8,12,15  
 207:13,17 208:11  
 220:1 225:13 233:6  
 240:10 255:19 312:22  
 313:2,4 430:21  
 432:17 433:10 456:13  
 462:12 470:22 479:11  
 482:13 483:5 488:16  
 529:4 531:1 533:3  
 536:2  
**certifications** 12:21  
**certified** 3:12 8:9 12:8  
 14:3 19:12 50:2,6  
 67:18 68:15 71:8  
 94:12 97:10 100:5,7  
 101:7 116:18 117:8  
 120:14 128:21 130:13  
 132:7,14,17 140:21  
 155:11 156:5,6,8  
 165:5,8 178:7,8 186:8  
 208:3,15,17 212:12  
 212:14 220:4 245:20  
 246:20 248:15,22  
 268:6 290:11 292:17  
 292:20 341:19 432:5  
 433:15 441:10 450:11  
 455:11 460:14,20,22  
 461:8,11,15 462:9,13  
 475:18 490:4 493:7  
 493:11 509:20 520:16  
 537:20 540:12  
**certifier** 79:13,16

125:20 144:3 255:22  
 318:14 341:18 420:19  
 480:6,18  
**certifiers** 2:14 12:20  
 13:8,21 14:4,16 29:20  
 30:8,19 41:21 72:12  
 80:10 93:18 112:14  
 119:9 130:21 131:12  
 131:18 134:9 146:11  
 156:11 216:22 217:11  
 219:10 245:7,12  
 266:13 312:16 313:12  
 331:6 335:22 341:15  
 345:12 348:5 354:21  
 371:8,12 383:16  
 420:18 424:3 480:15  
 507:12,13  
**certifiers'** 220:7 265:14  
**certifies** 138:19  
**certifying** 217:2  
**certify** 87:17 142:15  
 156:12 192:17 247:12  
 313:13 331:2 480:17  
**certifying** 41:21,22  
 245:12 318:17  
**cetera** 255:19 404:3  
 421:15 482:10 489:1  
 537:17  
**CFR** 366:7  
**CFS** 103:6 105:18  
**chain** 4:6 42:5 75:8  
 119:9 120:14 126:17  
 127:19 196:17,20  
 222:16,19,21 267:18  
 267:20 424:20 448:18  
 494:3  
**chains** 119:2  
**chair** 1:11,12 18:13  
 57:4 99:18 243:8,9  
 320:17 327:3 335:4  
 340:8 344:9 346:17  
 349:21 351:4 357:12  
 360:12 367:8 368:11  
 370:17 373:16 379:5  
 386:10 397:17 399:1  
 417:3 418:16 427:3  
 532:7 536:22 539:7  
 541:14  
**chaired** 53:18 99:17  
**Chairman** 1:10 67:15  
 99:11 302:18  
**challenge** 14:16 55:9  
 108:11 134:4 208:10  
 229:14  
**challenges** 108:15  
 151:12 230:2 285:6  
 285:13 446:11 490:21  
**challenging** 13:7 20:8

65:3,11 67:1 81:6  
 84:19 140:8  
**Chamerlain** 243:11  
**chamomile** 251:3  
**chance** 82:16 241:13  
 424:7 463:17 476:16  
**change** 9:14 25:10  
 63:11,15 72:6 100:12  
 119:16 120:16 130:20  
 142:21 143:7 175:3  
 178:13 198:1,9,19,21  
 215:15 233:15 255:5  
 255:6,17 268:16  
 284:12,12 317:5  
 337:17 342:4 355:12  
 376:22 377:5 379:9  
 379:16 395:22 422:9  
 459:2 485:5 486:6  
 497:21 511:3,10,18  
 528:19  
**changed** 91:22 131:1  
 355:18 358:22 473:8  
 496:1  
**changes** 143:1 175:3  
 284:9 304:6 396:6  
 424:5 449:21 453:9  
 453:18 503:14,21  
**changing** 304:5 337:8  
 341:22 498:14  
**chaos** 230:9  
**chapter** 78:4,12,13  
**chapters** 78:4,8  
**character** 6:15  
**characteristics** 42:15  
 195:19  
**characterize** 174:19  
**characterizing** 98:4  
**charge** 94:9  
**charged** 26:3  
**chart** 439:4,5  
**charter** 40:15  
**cheaper** 387:17  
**cheese** 159:15,15  
 163:11,13,14,15,18  
 164:5 166:20,20  
 167:1 168:16,17,18  
 170:4,10 171:8 172:4  
 172:5,7 193:19 194:1  
 194:11,16,22 195:2,8  
 195:18  
**cheese-type** 163:10  
**cheeses** 194:22 195:15  
**chemical** 46:4 206:20  
**chemically** 22:17  
 375:14  
**chemicals** 45:6 73:21  
 235:17 246:21 280:16  
 491:18

**chemist** 312:20  
**cherries** 269:22 270:19  
 271:2  
**cherry** 270:16  
**chewing** 393:1  
**chicken** 13:2 246:2  
**chickens** 151:1 307:12  
**chicory** 263:18  
**children** 69:15 507:7  
**Chile** 76:21  
**Chilean** 124:3 242:15  
 242:20  
**chiming** 495:14  
**China** 188:21 189:3  
**Chino** 3:14 302:15  
**chips** 20:22 21:1  
**chlorides** 354:11 358:5  
**chlorine** 4:8,9 102:12  
 227:17 251:16 270:7  
 270:11 271:4 272:18  
 321:1,2,5,14,15,20  
 322:2,12 323:19  
 324:12,13 326:7  
**chocolate** 102:7  
**choice** 46:5,6,9 74:13  
 169:5 170:9 502:10  
 512:12,15 513:2  
 519:4  
**choices** 294:4  
**choose** 85:2,7 110:21  
 114:20 132:9  
**choosing** 128:20  
**chose** 203:9  
**chosen** 117:13 376:17  
 480:17  
**Chris** 225:7 229:6  
**Christie** 2:10 142:10  
 146:18,19 147:2  
 149:17  
**Christopher** 3:9 221:1  
 225:3,4  
**cides** 173:10  
**cigarettes** 246:22  
**circle** 427:22  
**circumstances** 115:16  
 292:8 484:20  
**cisgenesis** 123:3,8  
 256:6  
**citations** 109:18  
**cited** 266:8  
**citing** 150:17  
**citizen** 474:3  
**citrate** 163:17,20 164:9  
 164:12,12,16,20  
 169:11,15,19,21  
 170:2,3,5  
**citrates** 170:12 194:15  
 195:1,16

**citric** 170:12 330:16  
 333:20,21  
**citrus** 102:2 177:21  
 179:1,20  
**city** 9:14 498:2,3  
**civilian** 408:7 412:3  
**claim** 161:9 198:11  
 403:22  
**claims** 148:19 363:14  
 363:17 405:1 489:4  
**clamshells** 469:21  
**clarification** 6:10 62:8  
 62:13 120:19 144:4  
 268:20 302:1 392:2  
 445:5 447:22  
**clarified** 85:3 198:9  
 261:5 315:1 445:11  
**clarify** 12:7 79:11,17  
 102:1 111:18 124:8  
 134:1 273:9 420:6  
 453:19 488:9  
**clarifying** 42:2 109:2  
 113:11 149:9 268:4  
 455:17  
**clarity** 83:1 123:6  
 137:10 421:10 422:5  
 496:6  
**Clark** 244:21  
**class** 28:14 32:2 57:11  
**classic** 88:7,9 90:5  
 92:13,21 93:6  
**classification** 197:21  
 198:2 221:11 256:14  
 396:16 402:14,15  
 415:22  
**classified** 210:11 256:7  
 375:2  
**classify** 256:13 396:17  
 396:19 416:1  
**clay** 290:22  
**clean** 205:17 209:20  
 228:3 330:20  
**cleaners** 147:10  
**cleanest** 202:4  
**cleaning** 321:14,17  
 323:3,4  
**cleansers** 42:16 160:5  
 323:12  
**clear** 6:19 12:10 15:21  
 52:22 57:20 58:3 66:9  
 66:10 68:2 81:8 85:5  
 85:6 92:8 101:22  
 103:14 109:17 117:6  
 117:12 118:1 125:17  
 133:7 136:1 137:12  
 140:20 156:9 157:1  
 216:3 221:10 238:3  
 289:18,20 301:18

302:4 361:10 362:13  
 380:14 404:5 430:1  
 463:5 483:12 515:3  
 527:4 531:9  
**cleared** 252:3  
**clearing** 199:11  
**clearly** 17:19 20:2 33:9  
 99:1 140:16 232:19  
 314:11 484:16 507:17  
 515:4,5  
**clicked** 313:17  
**clicker** 441:21  
**climate** 63:11,15  
 284:19 485:5 486:5  
 497:21 511:3,10,18  
**climate-friendly** 495:20  
**clippings** 287:19  
**close** 53:8 122:11  
 132:21 294:9 318:11  
 330:17 340:14 512:17  
**closed** 19:13 314:8,12  
**closely** 70:19 113:16  
 127:21 134:8 151:18  
 218:21 441:1  
**closer** 59:21 187:9  
 275:20  
**closest** 463:17  
**closing** 31:16 315:15  
**cloth** 289:8  
**clue** 212:5 218:5 503:19  
**co-** 118:22  
**CO2** 273:18 274:9,16  
 274:19 478:19 497:11  
**coal** 352:3  
**coalition** 2:10,14,15,16  
 3:16 19:16 34:3 95:8  
 116:13 121:18 138:16  
 147:3 189:14 200:6  
**coast** 78:22 80:15  
**coastal** 135:22  
**coastline** 135:14  
**coatings** 345:1  
**coattails** 458:1  
**cobalt** 4:14 357:21  
 358:10 359:13  
**Coca-Cola** 230:22  
**Cochiti** 513:15  
**coco** 236:18,18  
**coconut** 60:13 61:6  
 66:2 437:16  
**code** 70:4  
**coevolution** 496:2  
 498:17  
**Coexistence** 444:13  
**coffee** 155:10  
**cognizant** 472:19  
**coherent** 38:1  
**coir** 60:13 61:6 66:2

236:18 437:16 439:17  
 440:21  
**Colehour** 2:10 149:20  
 153:20 154:2,6  
 156:21  
**Coleman** 9:2  
**coli** 250:15 271:18  
 413:1 470:1  
**colleague** 109:21  
 180:12  
**colleagues** 140:6  
**collected** 190:12  
 461:13  
**collecting** 217:1  
**collection** 303:6,8  
 402:1  
**collective** 459:22  
 513:19  
**collectively** 254:7  
**colonized** 274:6 275:4  
**color** 361:18  
**combination** 23:16  
 107:5,14 164:13  
 171:5,8 194:13 195:4  
**combine** 164:16  
**combined** 461:17  
**combines** 218:18  
**come** 7:20 38:22 59:15  
 63:1 68:8 69:1 70:22  
 73:15 74:19 80:16  
 85:15 133:4 155:18  
 190:22 212:11 226:5  
 232:13 235:1,2  
 241:10 242:11 244:10  
 246:1 247:2 256:3  
 259:13 261:13 266:14  
 286:21 295:9 298:16  
 311:14 323:9 324:2  
 362:17 363:10 365:21  
 384:19 396:16 408:12  
 408:15 419:11 420:5  
 424:13 467:6 473:9  
 474:18 486:2 489:13  
 493:17 494:15 495:12  
 500:12,15 501:17  
 503:2 509:12 512:6  
 514:14 516:3 530:17  
 530:19  
**comes** 37:13 39:1 74:2  
 127:18 139:20 171:7  
 188:17 235:2,4 257:9  
 311:7 324:5 334:8  
 397:22 407:14 508:18  
 531:3 532:22  
**comfortable** 234:18  
 288:5 389:12 510:22  
 519:1  
**coming** 34:19 56:5

76:21 98:1 136:18  
 188:20,21 212:4,9  
 218:3,4 226:4 247:8  
 283:22 286:4 319:11  
 412:15 446:13 492:2  
 498:10 516:2  
**command** 494:3  
**commend** 52:18  
**comment** 4:1,21 5:8,10  
 5:13,15 6:4 7:1 16:2  
 18:2 25:17 48:13  
 91:11 109:21 119:20  
 133:14 137:17 138:22  
 143:2 146:6 153:1  
 166:9 175:22 193:11  
 196:7 221:14,16  
 223:5 225:19 229:7  
 241:8 242:19 252:16  
 257:8,17 258:14  
 260:4,7 273:1 279:13  
 280:14 292:5 294:18  
 295:7 315:15 336:17  
 341:12 342:6 345:13  
 347:21 348:8 355:6  
 363:22 364:20 377:14  
 377:16 379:18 381:4  
 384:4 388:14 403:19  
 410:10 413:6 424:7  
 446:11 448:4 454:10  
 455:16,18,19 504:17  
 511:2 524:19 525:4  
 525:12  
**commented** 51:22  
 134:6 257:18 258:2  
 258:12,13 421:10  
 458:7  
**commenter** 6:11,16  
 355:3 481:4  
**commenters** 5:21 6:13  
 7:3 77:7 163:22 258:1  
 268:19 282:1 323:1  
 354:19 371:6 412:11  
 422:11 457:14 458:7  
 458:18  
**commenting** 166:2  
 180:12  
**commercial** 100:15  
 177:15,18 186:4  
 205:2,16 206:4 208:5  
 271:12 292:17  
**commercial-sized**  
 310:18  
**commercially** 177:11  
 262:11  
**Commission** 243:8  
**commitment** 153:10  
 226:1 284:6 481:1  
**commitments** 303:1

**committed** 108:6,21  
 150:8 479:18  
**committee** 25:14 26:9  
 27:7 28:8 34:15,21  
 36:6 38:8 53:19 99:18  
 315:20 342:19,21  
 369:7 375:20 378:14  
 378:21 428:22 429:13  
 430:6 431:13 522:13  
**committees** 429:12  
**commodities** 39:9  
**commodity** 145:4 243:7  
**common** 201:7 220:2  
 222:8,14 263:13  
 285:6 435:5 437:15  
 518:20  
**commonality** 519:8  
**commonly** 162:8  
 163:11 195:1 355:2  
 404:13  
**commons** 39:9  
**communicate** 110:22  
**communication** 48:20  
 49:7 64:18 132:11  
 300:21 471:15  
**communications**  
 264:22 380:15  
**communities** 506:15  
 514:14,20  
**community** 9:2 16:3  
 36:3,11 39:16 51:10  
 55:15 56:2 57:10  
 59:19 64:21 73:1  
 104:4 110:17 113:17  
 121:21 130:11 145:5  
 253:2 316:10 380:15  
 442:9,10,10 443:1,3,4  
 443:19 444:18 446:3  
 447:4 454:7 456:5,8  
 463:10 475:14 489:18  
 490:3 498:20,21  
 504:19,22 505:7  
 506:1,5 507:1,5,9  
 509:2 513:9,13,17  
 514:9,9,13,19 515:9  
 515:11,12 523:7  
 528:12  
**companies** 100:20  
 108:14 177:9 193:10  
 195:7 259:3 283:3,9  
 409:5  
**company** 2:13 101:16  
 126:9 167:20 168:1  
 183:2 208:19 220:2  
 286:17,20 287:1,13  
 308:7 320:5 336:16  
 467:5  
**comparable** 82:17

314:9  
**compare** 64:1 86:10  
 249:8 437:22 468:18  
**compared** 161:2 169:10  
 205:13 306:3 434:3  
 439:17 457:6 499:14  
**compares** 135:20  
**comparing** 499:12  
**comparison** 489:4  
**comparisons** 63:21  
**compassion** 68:22  
**compatibility** 404:8  
 406:4 488:15  
**compatible** 375:21  
 407:1 454:6  
**compete** 77:1  
**competing** 76:17,20  
**competition** 76:14 79:5  
 185:2 493:5  
**competitive** 493:4  
**competitiveness**  
 110:15  
**compiles** 156:3  
**complain** 467:7  
**complaint** 201:7  
**complement** 143:5  
 408:12 411:14  
**Complementary** 250:18  
**complete** 37:1 134:9  
 141:8 212:16 276:4  
 278:18 318:19 336:6  
 387:6 502:10 537:13  
**completed** 6:11 40:20  
 190:12 322:5 328:16  
 335:18 341:4 344:18  
 347:16 351:14 354:16  
 361:2 374:21 400:12  
 422:16  
**completely** 65:14 82:5  
 114:8 206:15 264:21  
 305:1 313:3 314:3  
 455:1 480:3  
**complex** 22:17 108:22  
 116:4 140:17 500:19  
 501:6 502:1,2 503:18  
**complexities** 117:8  
**complexity** 116:5  
**compliance** 4:2 117:22  
 271:9 421:18 454:18  
 487:22  
**compliant** 30:4 51:14  
 199:13 448:7 454:8  
 480:11  
**compliment** 113:15  
**complimentary** 483:11  
**comply** 81:21 103:10  
 103:16 117:12 130:16  
 197:8,11 226:19

301:11 451:14 479:15  
**components** 130:22  
 175:10 328:19  
**composed** 239:3  
 487:16  
**composition** 101:8  
**compost** 11:19 13:2  
 20:21 21:10,12,16,20  
 23:8,10 29:2 88:22  
 173:12 174:1,2 175:4  
 288:20 289:14 317:22  
 371:15,21 402:6,9  
 406:13 413:3 440:18  
 447:6 466:7 487:17  
**compost-based** 447:16  
**compostable** 452:7  
 487:16  
**composted** 287:20  
 405:11 447:16  
**composting** 22:22  
 174:20 238:19 404:21  
 405:5,16,19,22  
 409:21 411:21  
**composts** 23:12 409:12  
 452:7  
**compounds** 394:19  
**comprehensive** 43:13  
 147:9 161:22 207:18  
 266:16 323:12 347:15  
**comprised** 328:18  
**comprises** 439:9  
**compromise** 11:12  
 13:16 14:11,12 15:1  
 34:20 51:21 53:9  
 62:10,12 68:9 69:1,2  
 81:17 93:16 117:21  
 120:5 121:1 128:15  
 141:2,3,9,14 201:17  
 204:2 442:12 459:6  
 463:9,16 481:14  
 482:5 487:3 489:20  
 490:1 492:10 493:17  
 494:16 507:2,3,14,19  
 510:2,3 512:13 517:3  
 517:4 519:2,18 520:4  
 520:9,11 521:7 523:1  
 523:10,12 524:10  
 526:16 538:17  
**compromised** 35:3  
 123:11 161:13  
**compromises** 524:3  
**computers** 7:17  
**concentrate** 258:10  
 262:2  
**concentration** 30:15,16  
 165:16,21 172:11  
 497:8  
**concept** 73:13 77:8

142:20 448:3  
**concern** 90:2 100:11  
 114:5 115:7 116:1  
 134:20 186:8 308:20  
 311:13 322:18 348:3  
 364:22 404:4,11  
 407:14 410:22 411:16  
 420:7,8 462:15,19,20  
 462:21  
**concerned** 134:14  
 152:17 215:12 234:7  
 266:6 329:2,22 425:6  
 462:11 474:3  
**concerning** 338:22  
 422:12 471:16  
**concerns** 104:15 115:2  
 143:18 152:13 205:15  
 223:22 224:9 337:13  
 351:22 376:11 379:17  
 380:18 382:17,21  
 408:17 409:15 411:3  
 446:20 454:6 488:21  
 495:12  
**concession** 141:12  
**concluded** 266:14  
 361:17 389:13  
**conclusion** 27:16  
 161:19 162:16 486:21  
**conclusive** 412:16  
**concrete** 475:11,22  
 515:22 516:7  
**condescending** 499:11  
**condition** 24:16 25:9  
**conditions** 10:17 24:20  
 25:9 105:9 110:7  
 130:17 151:8,19  
 178:5 180:19 181:4  
 186:13 222:17 405:20  
 407:22  
**conduct** 7:4 426:4  
**conducted** 122:19  
 134:13  
**conducting** 112:14  
**conducts** 340:12  
**conduit** 116:17  
**confectionary** 126:10  
 181:9  
**conference** 28:17  
 212:18 464:11  
**confidence** 229:1  
 379:15  
**confident** 261:13  
 310:16  
**confidential** 45:20  
 261:11  
**confined** 345:5 409:10  
**confirm** 416:9  
**conflict** 80:5 110:8

**conflicted** 329:20  
**conflicting** 515:2  
**conform** 58:15  
**confused** 65:14 395:4  
 533:16  
**confusing** 91:7  
**confusion** 148:16  
 149:13 157:6 236:2,5  
 237:20 289:21 512:11  
**congruent** 127:10  
**conjunction** 63:2  
**connect** 10:9  
**connected** 37:3 440:16  
**connection** 464:6,9  
**connections** 513:7  
**connects** 513:16  
**consciousness** 71:12  
**consensus** 25:19 50:8  
 50:11 51:18 52:7  
 59:15,22 60:5 62:9,11  
 204:8 369:5 493:19  
 519:21 528:14  
**consequences** 501:1  
**conservation** 90:12  
 406:8 445:16 466:14  
 468:12  
**conservative** 135:21  
**conservatively** 135:9  
 135:12  
**conserve** 140:14 453:2  
 467:16  
**consider** 8:15 33:14  
 57:21 64:12 71:14  
 82:21 83:6 118:15  
 122:8 152:5 155:4,7  
 266:2 313:12 342:3  
 345:14 489:12  
**consideration** 142:6  
 147:9 257:6 270:13  
 280:22 425:8 428:22  
 446:6  
**considered** 158:11  
 160:10 166:12 199:12  
 221:22 322:13 388:10  
 430:13 447:19 450:6  
 450:7 487:18 489:20  
 522:16  
**considering** 90:7  
 105:13 122:1 144:22  
 154:21 267:14  
**considers** 472:3  
**consistency** 83:1  
 164:18  
**consistent** 24:17 40:22  
 41:13 50:16 69:18  
 113:22 124:1 144:1  
 424:3 473:7,15,19  
 480:9

- consistently** 52:12 53:1  
103:21 266:13 268:2  
513:22
- consisting** 448:16
- constant** 440:5
- constantly** 284:5  
440:12 493:14
- constitute** 198:13
- Constitution** 232:7,14  
316:1,4
- constraints/resources**  
432:2
- construction** 471:20
- consult** 105:20
- consultant** 39:17 49:22
- Consulting** 2:21 50:1
- consume** 163:13
- consumed** 163:11
- consumer** 16:3 64:21  
65:6,11 69:4,6,9 70:7  
70:7,10 71:10,11,14  
75:22 83:10 95:4,22  
160:22 163:4 168:20  
195:20 215:13 219:17  
229:1 378:2 481:17  
486:10 487:1 491:11  
491:14 493:8 505:15  
513:2 519:3
- consumers** 3:2 10:3  
15:21 16:11,15,20  
17:16 41:15 64:18  
65:4 73:22 93:14 94:3  
95:16 96:3,7 102:15  
148:17 160:12 161:14  
163:12 164:18,22  
180:5,5 215:12 234:6  
235:10 238:3,5 271:9  
314:19 444:3,7 446:4  
458:19 483:3 486:13  
491:4,16 505:5,6,14  
510:16 512:3,4,6,14
- consuming** 147:6 160:8  
160:13
- consumption** 161:19  
170:16 508:14
- contact** 220:20 223:14  
321:16 341:1 343:9  
389:8
- contacted** 297:1
- contacting** 376:12  
537:15
- contacts** 212:3
- contain** 161:3 194:13  
197:7 278:4 362:8,21  
484:2
- contained** 22:18 45:12  
452:17 472:13 482:17
- container-based**  
451:19 461:16
- container-growing**  
313:9
- containerized** 65:1
- containers** 4:19 20:8,13  
50:3 61:13,22 62:9,11  
62:18 65:12 66:4 70:9  
84:16,16,18 88:15  
89:2 90:18 117:3  
118:5 121:11 190:20  
191:1,18 197:6  
201:15 211:18 272:2  
285:15 287:21 288:10  
315:20 317:2,12  
318:7 319:12 320:2,7  
428:13 430:16 431:2  
437:12 441:2 445:7  
450:11,20,21 451:7  
451:14 452:18 453:6  
453:16 459:8 462:6  
483:19,19 490:11  
492:3,12 523:10  
527:12
- containing** 103:21  
177:16 362:4 375:8
- contains** 431:17
- contaminate** 308:17  
414:3,22
- contaminated** 42:20  
108:17 420:8 425:13  
425:14
- contamination** 38:19  
108:15 119:1 207:10  
224:15 266:8,10,12  
272:5 290:12 311:14  
422:13 425:7,10
- contemporary** 10:2
- content** 21:22 22:4  
150:1 156:5,16 181:2  
278:4 304:7 402:17  
452:5 484:4
- contentious** 128:5  
429:11 433:12
- CONTENTS** 4:1
- context** 54:13,17  
131:20 144:21 151:16  
279:18 483:20
- continuance** 114:6
- continuation** 221:11  
228:6
- continue** 17:18,20  
23:13 37:8 52:20 76:9  
93:1 106:1 121:5  
123:12 131:5 134:14  
209:9,18 266:2 336:3  
337:4,19 376:14  
379:12 385:16 453:22  
526:18 532:10 534:17
- continued** 52:15 117:4  
119:16 167:21 227:16  
270:7 272:14,18  
331:4,5 484:21 493:6  
525:20
- continues** 41:17 141:20  
153:15
- continuing** 150:12  
335:11 344:14 354:8  
542:3
- continuous** 43:7 103:4  
131:20 255:8 458:5  
479:7
- continuously** 55:15  
277:20 279:22 479:21
- continuum** 16:8 444:7  
524:8
- contract** 132:3,6
- contradictory** 317:7
- contribute** 170:12  
239:12
- contributed** 65:9 442:5
- contributes** 43:1 63:15  
161:10
- contributing** 96:11,12  
509:2
- contributions** 9:7
- control** 115:16 122:19  
136:5 155:1,11 221:5  
223:7 250:6 269:9  
271:19 296:9 304:14  
332:17 333:12,13  
340:22 341:1,16  
342:8 343:8,9 344:15  
345:4 347:4 348:1,10  
374:18 375:12 452:22
- controlled** 10:18  
110:20 178:3 210:13  
457:5 508:1
- controlling** 194:9  
341:10
- controls** 452:10
- controversial** 71:6 98:9  
387:2 456:4 459:21
- convenient** 387:17
- conventional** 19:3  
23:21 63:5 64:2 66:16  
69:21 74:14 75:10  
82:2 92:7 93:2 114:15  
118:2 144:12,16  
151:11 180:11 182:17  
187:2 199:16 213:17  
270:1 283:5 290:13  
314:9 391:7 394:11  
394:18 414:10 482:19  
485:14,15 500:5
- conventionally** 64:4  
501:4
- converged** 456:11
- conversation** 16:18  
139:13 200:10 211:14  
266:3 384:22 414:18  
415:13,19 504:15  
505:16 511:22 512:1  
523:4
- conversations** 211:15  
419:19,21 495:3
- conversion** 206:20  
485:14
- convert** 4:4 39:8 42:1  
57:14 198:17 199:16  
199:17 207:3 401:17
- converted** 177:22  
206:11 274:18
- converting** 391:10  
485:15
- convince** 242:14  
309:14
- Coody** 2:14 107:17  
116:10,11,12 120:2  
120:11 121:7,9
- cool** 30:13 183:11
- cooled** 194:11
- cooperation** 145:8  
291:19
- cooperative** 214:19  
292:7
- cooperatives** 210:14
- coopers** 350:7
- coordinate** 212:22
- coordination** 132:12
- coordinator** 265:14
- copper** 4:11,14 346:20  
346:20 347:5,5,6,12  
347:14,16 348:4,22  
349:2,3 357:19 358:9  
359:9 417:7
- copper-based** 347:7
- coppers** 4:12 346:20  
347:5,20 348:12,15  
348:20 350:6
- copy** 192:21
- core** 285:18
- corn** 171:5 212:14  
216:8 309:6 389:20  
389:22 390:20 393:6  
393:8,19 440:1,6
- corporate** 39:2 97:20  
243:3,15
- corporation** 36:4 37:4
- correct** 27:19 66:5  
76:11,12 80:14  
192:11 258:11 279:18  
296:10 298:6 324:12  
329:11 352:15 392:9  
493:22 528:5 539:13

**corrected** 353:4  
**correcting** 352:17  
**correction** 352:19  
**correctly** 27:22 264:1  
**correlating** 361:21  
**corrosive** 322:20  
**corrupt** 212:8  
**cost** 108:20 170:1  
 197:18 309:13 336:20  
**costs** 285:7  
**Council** 3:9 159:4 168:2  
 243:5 269:19,21  
**count** 523:19 528:18  
**counter** 278:15 279:5  
 394:14 472:2  
**counterion** 222:11,12  
**counterpart** 144:9  
**counterparts** 93:2  
**counting** 523:20  
**countries** 211:5 217:7  
 217:16 218:2 219:5  
 312:22  
**country** 13:9 72:12  
 95:20 212:10 227:9  
 227:21 230:5 303:7  
 303:11 315:9  
**County** 145:2 290:19  
**couple** 40:14 44:13  
 145:1 203:14 226:13  
 229:20 239:7 259:22  
 288:12 294:8 309:20  
 373:22 383:15 450:14  
 462:2 483:9 486:9  
 505:17  
**coupled** 115:8 130:20  
 135:7  
**course** 18:21 30:5  
 50:13,20 83:3 101:3  
 106:14 115:10 120:3  
 125:7 208:1 245:7  
 274:11 337:11 393:8  
 415:6 432:18 435:21  
 439:1 440:6 459:17  
 472:17,18 476:19  
 479:2 480:17 482:11  
 483:9 484:18  
**cover** 12:4 30:2 59:4  
 288:1,2 406:6 451:20  
 452:2 465:8 503:4,8  
**covered** 42:5 254:19  
 375:18 410:17  
**covering** 289:7  
**covers** 344:22  
**cow** 436:3  
**cows** 435:20 515:18  
**CP** 2:20 3:3 179:15  
 182:8  
**crack** 280:6

**cracked** 33:11  
**cracks** 220:6 341:9  
 342:15,20 516:2  
**crafted** 446:7 473:6  
**Craig** 243:6  
**crazy** 231:1,3  
**cream** 166:11 256:13  
 256:20  
**creamier** 164:20  
**creams** 194:2  
**creamy** 164:21 168:21  
 172:5  
**create** 24:16 37:4 52:7  
 53:1 81:15 92:3  
 110:18 139:13 157:6  
 181:7 183:17 187:4  
 190:2,5 191:16 236:2  
 454:5 501:13 512:10  
 514:11 524:22  
**created** 48:11 205:21  
 494:3  
**creates** 119:4 143:9  
**creating** 50:22 111:5  
 131:13 139:9 232:21  
**creation** 37:20 513:13  
**creators** 140:15  
**creatures** 39:12  
**crevices** 341:9  
**crews** 389:11  
**cringe** 425:2  
**crises** 55:19 56:5  
**crisis** 55:17 56:4,6  
**criteria** 42:19 54:18  
 192:16 208:11 219:11  
 294:2 343:11 366:6  
 402:19 409:11  
**critical** 10:22 54:14  
 104:12 122:7 151:5  
 151:11 152:4 160:9  
 226:2 227:9 257:11  
 271:4,17 272:19  
 347:22 348:15 387:18  
 424:6,12,14  
**critically** 99:2 118:22  
**criticisms** 488:14,18  
 489:6  
**criticizing** 146:13  
**critiques** 77:9  
**cropping** 59:4 358:20  
 406:6 451:20 452:2  
 495:10  
**crops** 4:7 11:12,18  
 14:13 28:1 30:2 53:19  
 66:4 75:11 81:22  
 93:16 103:6 116:22  
 118:4 147:16 157:22  
 191:10 246:13 265:15  
 282:5 287:20 288:1,2

288:10,12 291:1  
 292:17 296:9,15,19  
 298:9,17,22,22  
 299:11 300:2 301:4  
 301:15 320:15 322:14  
 322:15 328:14 337:3  
 337:16 341:2 342:3  
 343:10 348:1,5 356:9  
 361:14 374:19 375:12  
 375:20 377:1 378:15  
 378:22 381:12,20  
 382:8 383:18 386:20  
 390:5 392:15 399:21  
 400:8 407:9 419:5  
 422:21 423:4 428:18  
 432:7 434:8 435:8,12  
 436:16 451:6,14  
 452:10 457:7 459:3,5  
 459:7 465:8,15  
 478:18 482:6 494:14  
 503:5 542:2  
**crops\*** 38:15  
**cross** 272:5  
**crucial** 103:3 225:20  
**crucify** 471:11  
**cruelty** 150:3 153:5  
**crusade** 67:22  
**Cruse** 2:14 253:21  
 265:10,13,13 268:22  
**crust** 60:18 192:18  
 491:3 511:14  
**crystals** 170:3  
**CS** 403:8,15 459:18  
 463:8  
**CSA** 19:12  
**CSF** 103:14  
**CSO** 189:20 192:9  
**Cuatro** 2:8 36:3,9  
**cubic** 277:6  
**cucumbers** 12:13  
 190:13  
**Cufone** 2:15 196:4  
 200:4,5 203:20 204:6  
 204:17  
**culpability** 273:16  
**cultivation** 72:4  
**cultivators** 475:17  
**cultural** 333:14 348:13  
 467:12  
**culture** 24:11  
**cup** 184:1  
**curious** 16:5 25:21  
 46:19 64:17 71:18  
 96:21 153:4 209:14  
 258:4 286:13 409:4  
**current** 109:8 122:2,17  
 124:19 126:11 129:1  
 136:2 137:4 143:3,15

221:11 224:1 225:21  
 337:8 446:3,4 456:11  
 458:14 490:1  
**currently** 49:14 66:5  
 110:6 144:2 165:5,8  
 178:6 179:1 182:22  
 188:8,22 192:11,17  
 208:14,16 225:12  
 249:2 272:9 303:21  
 336:14 371:13 406:11  
 411:20 490:12  
**curve** 481:21  
**customer** 207:21 491:8  
**customers** 73:15  
**cut** 68:2 74:20 173:19  
 253:19 281:9 290:1  
 301:21 339:10  
**cuttable** 186:22  
**cutting** 86:5 136:14  
**cuttings** 88:21  
**cycle** 92:2 191:2 309:2  
 434:15  
**cycled** 287:18  
**cycles** 59:5 440:11  
 445:21  
**cycling** 191:2 440:5  
 478:17 501:8 509:19  
**cystine** 310:1

---

**D**


---

**d** 369:1 474:17  
**dabbled** 24:14  
**daily** 512:3  
**dairy** 3:5 60:17 66:16  
 66:20 77:18 102:7  
 148:18 149:2,6  
 159:14 165:17 166:12  
 167:1,5 168:6,9,15  
 169:2,3,8,18 170:8,19  
 171:12,14 193:6,7,9  
 193:15,17 194:3  
 195:7,21 252:13,13  
 252:19 253:16 435:18  
**Dairy-based** 168:18  
**damage** 38:19 138:8  
 329:5  
**damages** 215:16  
**damaging** 314:17  
**Damewood** 2:15 67:12  
 81:3,3 84:7 85:17  
 86:16,20 87:3,5,19  
 89:4,18 91:13,16  
**damn** 68:21  
**damping** 452:10  
**Dan** 1:18 2:11 5:5 7:19  
 7:21,22 8:4 23:17  
 43:10 44:10 74:18  
 75:2 97:16 261:6

333:10 350:11 409:2  
 481:16 486:18 487:4  
 515:2 518:18 522:21  
 523:16 531:5,14  
**Dan's** 420:4  
**dare** 513:12  
**data** 17:5 132:4 183:6  
 190:12,15 224:20  
 249:6 250:13,22  
 251:5,6,7 293:18  
 295:14 296:21 298:20  
 436:15 439:13 460:18  
 461:13 492:2 497:14  
 499:15  
**database** 261:19,22  
 262:10 266:17,20  
**date** 106:5 140:22  
 150:9 365:7,8 392:7  
**daughter's** 57:11  
**Dave** 1:16 25:11 43:10  
 46:15 63:17 64:6  
 129:16 133:10,10  
 139:14 209:13 213:4  
 237:9 244:5 290:1,2  
 343:16 377:10 394:7  
 416:10 494:21 540:18  
**David** 2:18 3:14 133:15  
 282:3 291:9 302:12  
 302:15 306:6 353:3  
**Davis** 21:9 286:21  
 303:22  
**Davis'** 311:5  
**day** 7:9 76:22 82:8,10  
 82:11,14 115:11  
 154:18 208:2 215:11  
 215:11 223:18,19  
 281:3 292:4 305:18  
 305:19,22 306:2  
 310:21 413:4 414:2  
 427:5 436:6 464:11  
 472:8 503:19 513:6  
 515:18 542:1  
**day-to-day** 446:12  
**days** 8:18 52:4 57:9  
 173:18 175:2 254:9  
 254:12 304:15 401:22  
 410:2 462:3 464:4  
 483:10 505:17  
**days-** 401:5  
**DDT** 500:21  
**de** 1:15 171:4,18 172:8  
 325:13 326:11 327:22  
 335:2 340:5 344:5  
 346:12 350:19 353:16  
 357:4 360:2 366:19  
 367:21 370:4 373:2  
 381:11,22 386:9  
 397:15 398:20 416:21

418:11 426:19 430:9  
 510:9 531:22 536:14  
 538:20 541:4  
**deadline** 295:6  
**deadly** 230:7  
**deal** 30:13 35:19 41:6  
 89:14 101:3 214:20  
 214:21 227:4 230:15  
 230:21 253:1 254:10  
 285:6 290:13 376:13  
 413:20 414:4 456:4  
 481:22 497:21  
**dealing** 33:5 35:18  
 230:1,2 284:18  
 322:15 411:2  
**dealt** 30:17,18 152:19  
**Dean** 243:10  
**dear** 256:15 471:3  
**debate** 33:2 78:20  
 244:15 460:4 488:6  
 529:7,17  
**debating** 317:7 459:22  
 505:20  
**decades** 391:8 464:1  
**decanol** 374:10 375:7  
 396:19  
**decide** 26:16 69:4 70:8  
 307:12 313:10 519:10  
 527:18  
**decided** 59:20 156:7  
 299:8 342:22,22  
**decision** 8:13 26:5,7,11  
 54:3 75:15 109:19  
 198:6 226:6 302:8  
 395:14 396:2 408:18  
 408:20 444:16 485:13  
 506:11 524:13  
**decisions** 26:8 38:12  
 54:13,20 110:21  
 408:5 480:10  
**decisive** 280:9 340:12  
 489:13  
**deck** 56:22 273:4 312:6  
 315:14  
**declared** 262:11  
**declined** 150:15  
**decomposing** 438:14  
**dedication** 189:19  
**deemed** 407:1 447:7  
**deep** 83:11 277:1,2  
**deeper** 507:19  
**deeply** 9:9 134:14  
**defeated** 513:22  
**defeating** 472:6  
**deficiencies** 55:9  
**deficiency** 354:12  
 355:15 356:1,2 358:6  
 358:22

**deficient** 452:14  
**defies** 496:2 498:17  
**define** 8:13 16:16 27:22  
 66:7,11,19 87:7 89:1  
 93:5 149:13 538:11  
**defined** 17:19 21:21  
 35:10,16 66:17 67:5  
 83:20 84:2,21 201:5  
 221:21 335:14 339:9  
 432:11,19 433:13  
 441:9 445:19 448:18  
 449:17 530:21 531:7  
 531:10 537:12 540:11  
**defines** 10:12 141:3  
**defining** 20:17 40:20  
 84:14 149:14 285:14  
**definitely** 16:7 88:10  
 107:10 120:12,15  
 251:1,7 260:2 263:4  
 415:9 487:8 504:14  
 510:11 511:6 522:22  
**definition** 20:16 38:6  
 58:10,12,15 65:15,18  
 66:9,14 85:5 92:11  
 104:21 109:13,17  
 111:19 123:5 141:9  
 143:14,15 448:13  
 449:22 450:9 473:5,6  
 473:13 532:12 535:21  
 537:11 539:16  
**definitions** 39:4 58:19  
 111:12 256:5,9  
 530:19,19  
**definitive** 161:19 480:7  
**defoliant** 354:10 358:4  
**degrading** 339:1  
**degree** 126:22 502:4  
**degrees** 36:15,16  
 401:11,21 402:16  
 405:12,15  
**delay** 228:12 241:3  
 247:5 379:11,12  
**delaying** 419:2  
**delays** 150:11  
**deletion** 400:7  
**deliberate** 408:18  
**deliberated** 382:20  
**deliberating** 391:5  
**deliberation** 385:17  
 400:19 407:8 409:17  
**deliberations** 302:5  
 377:1 382:6 383:18  
 402:5 430:3  
**deliver** 184:17 440:19  
**demand** 54:9 245:11  
 314:5,15  
**demanded** 100:1  
**demanding** 9:14

**demands** 195:20  
**democratic** 82:18  
**demonstrate** 50:7  
 113:2 135:2 336:21  
**demonstrating** 112:21  
**Denver** 215:3  
**deny** 505:5 511:3  
**denying** 104:14 511:4  
**department** 1:1 18:15  
 57:5 125:16 135:16  
 363:12  
**depend** 12:19 39:13  
**dependence** 125:21  
**dependent** 229:2  
**dependents** 38:1  
**depending** 17:10 195:5  
 224:4  
**depends** 17:7 194:15  
**depleting** 103:22  
**depletion** 144:22  
**deposits** 351:11  
**depth** 251:12  
**Deputy** 2:5 99:10  
**derived** 133:18 222:20  
 335:16 339:11 401:8  
**deriving** 365:1  
**dermal** 387:15  
**describe** 58:19 238:10  
 361:19 449:11 473:14  
**described** 44:21 131:2  
 186:14 255:2 405:9  
 449:13 450:13 456:13  
**describing** 286:10,15  
**description** 267:10  
**desert** 498:6  
**deserve** 291:17 469:11  
**deserves** 526:7  
**desiccant** 354:11 358:5  
**design** 56:9  
**Designated** 2:6  
**designation** 183:4  
 208:8  
**designed** 447:16 484:2  
**designing** 479:22  
**desirable** 141:13 178:2  
**desire** 185:6  
**desired** 51:12 194:10  
**desorption** 274:13  
**despite** 51:20  
**destroy** 68:18  
**destroyed** 309:11 485:8  
**destruction** 57:17  
 144:7  
**detailed** 121:4 137:21  
 255:13 409:22 420:22  
 488:5  
**details** 180:13 239:4  
 275:16 321:3 382:19

- detasseling** 393:5  
**determinations** 109:3,7  
 198:4 262:20 480:12  
**determine** 51:13 403:9  
 403:16 404:1 416:6,7  
 421:2 493:6  
**determined** 170:16  
 233:4  
**determining** 263:6  
 473:18  
**detrimental** 107:9  
**devastate** 73:3  
**devastated** 230:12  
**develop** 30:10 106:1  
 123:5 150:13 266:11  
 280:21 288:22 319:22  
 508:3  
**developed** 71:21  
 200:11 213:11 260:19  
 274:13,22  
**developers** 183:15  
**developing** 25:4 72:4  
 130:12 131:11 246:10  
**development** 36:4  
 118:14 143:3 147:21  
 148:2 161:10 361:18  
 374:20 400:10 505:3  
 505:4  
**develops** 107:13 430:4  
**DEVON** 2:4  
**devote** 189:17  
**dialogue** 7:12 121:5  
 140:6  
**diatomaceous** 101:21  
 126:14 229:18  
**Dicamba** 394:17  
**dicots** 223:15  
**dictate** 70:9 132:19  
**dictated** 132:6  
**Dictionary** 141:3  
**die** 308:14 317:17,18  
**dies** 284:15  
**differ** 129:1,2  
**difference** 22:3 235:14  
 235:16 387:20 438:1  
 438:2 458:10 503:5  
 503:13 534:3  
**differences** 11:7 15:3  
 22:4 78:19 185:1  
 186:20 222:9  
**different** 10:14 13:8  
 17:5 26:12,16 28:7  
 62:16,17 76:15 82:6  
 83:8 84:11 92:20  
 127:8,17,22 128:10  
 128:16,17,18 160:21  
 163:5 175:12 176:8  
 181:12 182:11,14,15  
 183:13 204:11 230:5  
 232:2,2,3,4 263:12  
 274:14 275:5 286:21  
 325:5 345:1 381:14  
 386:21 387:3 411:18  
 438:11 439:18 440:20  
 443:2 456:17 458:11  
 468:18 491:10,14  
 492:20 493:9,12  
 503:4 504:14 506:15  
 511:9 516:15 518:20  
 523:19  
**differentiate** 15:9 27:22  
 75:19  
**differentiated** 93:1  
**differentiates** 56:8  
**differentiation** 103:14  
 118:1 481:13 533:20  
 535:4  
**differently** 14:1 160:8  
 293:13 411:9 484:19  
**differing** 195:19  
**difficult** 14:12 20:2,19  
 117:5 134:9 186:3  
 241:18 293:20 308:5  
 320:6 330:17 333:7  
 342:16 348:6,6  
 481:20 489:22 524:12  
**difficulty** 134:7 137:14  
**digestate** 4:18 104:15  
 104:17 399:18 400:1  
 401:3,3,8,19 402:9,12  
 403:3,5 404:3,11,20  
 405:10,18,22 406:2,9  
 406:11,19 407:9  
 408:14 409:6 410:11  
 410:16,19 416:1  
 417:18  
**digester** 401:9,13 405:3  
 410:17  
**digesting** 420:5  
**digestion** 402:21  
 404:14,16 417:12,14  
**digests** 415:3  
**digging** 513:8  
**dignity** 38:21 94:4  
**digress** 514:3  
**dihydrate** 154:22  
**dinner** 211:12  
**dioxide** 4:9 102:9  
 126:15 270:11 271:21  
 321:2 322:2 324:13  
 326:7 497:1,6,7,15,18  
**dips** 168:18  
**direct** 205:18 321:16  
 341:1 343:9 510:5  
**directed** 100:10  
**direction** 51:17 109:5  
 138:5 394:15 478:10  
 486:11 489:7  
**directions** 321:22  
**directly** 6:22 13:1  
 101:16,20 132:16,18  
 160:7 201:9 289:3  
 511:13  
**director** 2:3 53:17 57:3  
 81:4 107:19 121:17  
 133:16 150:1 159:3  
 200:5 210:9 221:4  
 283:2  
**Directors** 18:13 57:10  
 67:16 72:14 79:20  
 81:11  
**dirt** 201:9,18,21 202:2  
 203:11 245:3 246:1  
 476:11 513:8  
**dirty** 216:22 477:19  
**disagree** 69:5 376:8  
 384:5 474:8 487:19  
**disallow** 319:17  
**disappeared** 417:6  
**disappearing** 474:14  
**disappears** 284:15  
**disappointed** 101:10  
 202:8 234:1 377:22  
**disapproved** 534:8  
**disaster** 318:19  
**disclose** 6:7  
**disclosure** 69:3 70:3  
 493:8  
**discord** 526:19  
**discourage** 514:18  
**discuss** 226:5 227:16  
 280:11 302:22 312:12  
 346:21 372:2 389:8  
 519:15,17 528:2  
**discussed** 86:6 108:18  
 123:17 157:13 223:6  
 279:16 296:11 338:3  
 344:21 375:1 377:7  
 381:21 404:8 412:22  
 428:20 443:16  
**discussing** 44:3 214:19  
 534:4  
**discussion** 4:20 26:7  
 54:16 58:16 63:12  
 85:4 104:6 108:3,8  
 112:5 139:9,22  
 141:20 157:17 159:17  
 160:5,11,18 198:7  
 213:6 225:18 315:19  
 317:6 329:13 367:12  
 379:7 380:1,8 388:1  
 394:6 408:22 411:18  
 415:15,19 423:15  
 425:5,15 428:4 429:2  
 429:3 432:8,9 442:6,9  
 443:7,12 446:9  
 454:10 457:4,11  
 469:15 525:13,20  
 527:12,20 528:5  
 530:3,17 533:10,14  
 535:17,18 537:5,8  
**discussions** 215:10  
 302:5 362:14 378:14  
 389:13 429:6  
**disease** 110:16 114:21  
 161:11 347:4,22  
 348:10 486:1  
**disease-suppressant**  
 452:12  
**diseases** 151:9  
**disenfranchised**  
 462:17 475:5  
**disestablishment**  
 316:7 317:1  
**disincentive** 143:6,9  
**disinfect** 228:3  
**disinfectant** 248:19  
 271:16 272:4 321:18  
**disinfectants** 42:16  
 147:10,16 321:13  
 323:11  
**disodium** 168:14  
**disparaging** 260:5  
**dispassionate** 480:12  
**dispel** 206:3  
**dispersion** 194:20  
**dispute** 141:11  
**disqualifier** 393:19  
**disregarded** 223:4  
**disrespect** 9:16  
**disrupting** 45:6  
**disruption** 486:7  
**dissolved** 180:21 317:9  
**distance** 294:5  
**distances** 446:19 483:2  
**distinct** 110:19  
**distinguish** 82:1 86:1  
 89:22 90:3 92:6  
 457:12  
**distinguishing** 88:1  
**distorting** 39:3  
**distribute** 116:14  
**distribution** 443:10  
**distributors** 341:14  
 354:21  
**disturbing** 94:18  
**ditches** 224:2,10  
 328:12  
**ditto** 316:12 318:3  
**dive** 502:11 525:2  
**diverse** 51:2 140:18  
 189:4 190:20 466:8

473:10 498:21  
**diversified** 154:7  
**diversifying** 130:15  
**diversion** 516:10  
**diversity** 13:17 15:2  
 190:16 226:4 348:11  
 348:12 442:21 443:3  
 490:9 499:9  
**divert** 485:14,15  
**divide** 83:11  
**divided** 136:7 489:15  
 528:12  
**dividing** 190:2  
**division** 2:4 489:17  
 506:22 507:8,9,10,12  
 507:13  
**divisive** 200:12  
**divorcing** 45:22  
**doable** 389:14  
**docket** 48:11 49:7  
 139:13,17 145:15  
 220:19 363:11 376:20  
 380:12  
**doctor** 291:20  
**doctors** 80:10  
**document** 4:20 104:6  
 110:2 139:10 159:18  
 160:6,11 255:1  
 278:12 318:14 348:9  
 404:12 412:20 422:17  
 423:7,22 425:16  
 429:2,3 527:12,21  
 528:5 530:20,21  
**documentation** 207:19  
 267:7,12 268:1 421:5  
**documented** 354:13  
 355:14,15 358:7  
 359:1,1  
**documenting** 356:1  
**documents** 47:5 50:7  
 108:3,8 111:17  
 139:22 160:18 211:10  
 214:2,2 219:9 315:19  
 317:6 377:8 424:12  
 424:14 432:10  
**dogs** 319:2  
**doing** 12:1 24:15 39:18  
 121:19 176:9 218:21  
 218:22 273:20 289:6  
 295:19,19,21 308:8  
 308:10 336:21 389:11  
 424:16 518:1 522:10  
**dollar** 504:21  
**dollars** 215:17  
**domestic** 43:5 119:2  
 122:9 189:5 214:10  
 214:17 216:17  
**domestically** 122:6

188:9 214:15  
**dominant** 110:19  
**Donald** 243:5  
**door** 31:16 33:4,8,10  
 157:8 174:4  
**doors** 512:7  
**Dorais** 190:9  
**dot** 197:4,4,4  
**doubt** 379:8  
**downloaded** 113:10  
**downstream** 297:22  
**downtime** 155:3  
**dozen** 131:18 142:16  
**draft** 82:21 85:17  
**drag** 527:6  
**drain** 452:17  
**drain-to-waste** 452:18  
**dramatic** 485:4  
**draw** 84:17  
**dream** 509:2  
**dried** 185:20 310:22  
**drift** 467:11,11 468:17  
 468:17  
**drink** 316:11  
**Drinking** 321:19  
**drinks** 181:14,18  
**drip** 87:1 503:9,11  
**drive** 284:5  
**driven** 55:17 280:4  
 505:13  
**drivers** 284:11  
**driving** 57:17 454:3  
**drought** 9:21 446:13  
**drove** 214:12  
**drug** 104:17 526:12  
**dry** 37:13 306:18 307:6  
 435:20 436:4,6  
**drying** 185:17,22 186:4  
 402:19 403:6  
**due** 16:4 104:15 111:14  
 139:21 160:21 169:5  
 170:4 194:17 269:8  
 342:1 364:19 366:9  
 384:2  
**Duke** 497:5  
**dumb** 71:10,11  
**dump** 272:4 509:9  
**dung** 310:7,8  
**duplicate** 470:17  
**duplicating** 187:10  
**duration** 402:19 440:11  
**dust** 4:16 370:20 371:2  
 371:16 372:2,19  
**dwelling** 329:17  
**dynamics** 383:3

---

**E**


---

e 4:15 250:15 271:18

340:20 344:14 360:15  
 361:1,8 364:10,17  
 367:12,14 413:1  
 469:22  
**e-petition** 313:17  
**E-T** 471:22  
**ear** 389:22  
**earlier** 69:5 79:12 120:5  
 287:22 291:18 293:13  
 323:15 400:12 405:13  
 412:10  
**early** 49:14 232:20  
 443:7 478:15  
**earn** 201:15 461:21  
**earned** 203:8 481:21  
**ears** 249:15  
**earth** 37:13 39:1 60:19  
 101:21 126:15 129:6  
 192:18 201:16 202:2  
 229:18 491:3 511:14  
 513:21 514:7  
**earth-bermed** 88:17  
**earthworm** 452:8  
**earthworms** 242:18  
 447:14 449:6 516:2  
**easier** 342:20 390:14  
 434:16,17,18 461:21  
**easily** 102:16 467:19  
**east** 78:22 80:15 460:8  
**easy** 52:2 180:7 183:1  
 307:22 332:13 349:1  
 427:8  
**eat** 305:18 308:13,17  
 436:8  
**eating** 279:2  
**echo** 383:1,22 394:1  
 510:11 513:3 515:8  
 534:10  
**ecological** 10:12 43:2  
 138:14 140:14 143:16  
 447:18  
**ecologically** 105:12  
 107:4 134:13  
**ecologies** 447:13  
**ecology** 51:2 105:21  
 448:1,12  
**economic** 39:16 75:16  
 115:1 144:11,20  
 147:21 148:1 297:22  
 388:8 514:1  
**economically** 68:18  
 73:3 105:21  
**economics** 78:22 79:2  
 191:15  
**economies** 286:6  
**ecosystem** 10:21 37:21  
 89:13 105:13 107:9  
 134:21 142:22 143:12

143:14 144:6 199:11  
 448:16,18 457:21  
 465:2 466:11 467:4  
 467:20 500:17 503:14  
 504:1,3 506:1  
**ecosystems** 4:5 57:15  
 142:19 144:18 198:18  
**edge** 250:7  
**edges** 36:18 332:17  
 388:5  
**edible** 321:20  
**edits** 131:2  
**educated** 69:12,13  
**education** 108:1 130:4  
 145:9 340:11  
**educational** 37:17  
**effect** 63:16 171:6,12  
 172:18 336:7 472:6  
**effective** 169:14 172:14  
 228:10 229:13 322:13  
 363:3 390:7,11  
**effectively** 23:5 107:4  
**effectiveness** 249:4  
 251:13  
**effects** 134:20 389:6  
 406:17 485:4  
**efficacy** 363:14 366:10  
**efficiency** 10:2 110:15  
**efficient** 317:21  
**effluent** 206:10,17  
 402:1  
**effort** 92:10 425:3  
 463:17  
**efforts** 57:13 133:22  
 425:4  
**egg** 225:11 226:17  
 227:19 302:16,17  
 303:6,15  
**eggplant** 12:13  
**eggs** 311:2,4  
**Egypt** 471:1  
**eight** 118:13 337:22  
 338:1 342:9 356:9  
 372:10 375:8 385:10  
 426:6 537:1 539:8  
 541:15  
**either** 12:12 22:16  
 31:22 84:22 85:20  
 87:9 199:5 231:2  
 235:19 248:20 289:20  
 319:18 337:7 383:10  
 383:11 401:12 404:2  
 488:10 509:20 523:12  
 529:6  
**either/or** 476:21 477:2  
**ELA** 1:15 65:14,17 66:1  
 66:6,9 133:2,7 137:8  
 153:4 174:18 175:5

- 186:11 297:10 325:16  
326:14 327:11 332:11  
334:13 339:16 342:17  
344:8 346:15 347:19  
349:18 350:22 353:19  
357:7 360:5 366:22  
368:2 370:7 373:5  
383:1 384:19 385:20  
387:5 388:12 393:14  
397:4 398:9 417:2  
418:14 423:20 426:22  
499:19 532:3 536:17  
539:1 541:7  
**elaborate** 185:9 407:4  
**Elan** 3:13 99:13 100:2  
**Elan's** 102:5,7  
**elders** 9:1,8  
**electrical** 485:7  
**electrolyte** 251:17  
**electrolytes** 251:18  
**electronic** 219:1,6  
**elegant** 20:17 437:4  
**element** 10:21 434:17  
**elemental** 226:14  
**elements** 118:10  
434:12  
**elephant** 494:1  
**elevated** 161:9  
**eligible** 85:10,15  
103:16 203:13 396:4  
**eliminate** 42:21 57:14  
81:18 119:17 317:11  
430:12  
**eliminated** 149:14  
446:21  
**eliminates** 103:8  
**eliminating** 4:4 42:1  
198:17  
**elimination** 404:6  
**Eliot** 9:2  
**elucidate** 236:17 446:2  
**email** 248:20 469:14  
**embrace** 457:9  
**embraced** 207:11  
**emergency** 149:9,13,15  
155:10 250:3 310:16  
**emergents** 110:14  
**emerging** 54:21 98:2,6  
**Emily** 1:17 3:5 17:22  
43:10,20 60:7 62:6  
106:11 136:16 137:2  
145:12 152:11 162:21  
162:22 185:4 189:9  
193:3,5 198:15  
223:21 286:1 300:19  
301:20 324:6,16  
325:10 326:8 327:6  
329:13 338:2 339:13  
342:12 344:19 345:21  
350:9 352:11 361:4  
366:11,15 367:15  
369:21 376:6 377:9  
377:13 379:20 380:9  
381:17 382:3 383:1  
388:19 390:16 393:22  
395:8 396:21 398:5  
399:6 407:18 415:15  
416:4 417:22 419:14  
420:1,13 459:11  
519:9 522:20 531:2  
**Emily's** 11:9  
**emotional** 280:3 506:12  
514:6  
**emphasis** 69:6 120:19  
143:4 193:18 348:14  
**emphasize** 69:12 408:2  
443:20 444:15 504:17  
**emphasizes** 118:11  
**emphatic** 478:5  
**employ** 98:12 403:6  
406:4  
**employed** 286:19  
**employee** 215:3  
**employees** 76:19  
**employing** 165:8  
**employment** 208:2  
483:1  
**emulsification** 164:10  
169:1,18 171:16  
179:22 194:9,19  
**emulsifier** 169:11  
171:13,18  
**emulsifiers** 171:11  
172:15  
**emulsifying** 169:5,6  
170:9 193:20 194:3  
194:12  
**emulsion** 13:3 245:21  
**enable** 57:20 140:3  
**enclosed** 35:11,11  
206:15  
**enclosure** 451:1,6  
**enclosures** 428:13  
445:7 450:20  
**encompass** 88:4  
473:22  
**encompassing** 473:9  
**encourage** 6:10 44:8  
47:12 52:13 59:15  
64:11 115:10 132:20  
144:11,15 147:22  
152:1 192:15 220:18  
380:11 478:12 510:14  
510:21 528:13  
**encouragement** 233:13  
**encourages** 51:20  
251:8  
**encouraging** 112:6  
114:1 252:2  
**end-to-end** 489:3  
**endocrine** 45:5  
**enemy** 82:8,9  
**energy** 176:16 202:10  
225:22 273:12,18  
488:21 498:7 508:14  
528:1  
**enforce** 14:12,16 348:6  
445:14 494:10,19  
**enforcement** 41:14  
42:5 43:4 55:11  
113:22 131:19 144:2  
144:8 145:9 156:19  
316:16 318:9  
**enforcing** 113:20  
131:14  
**engage** 140:6  
**engaged** 46:21  
**engagement** 254:14  
**engineer** 501:22  
**engineered** 38:16  
**engineering** 42:3  
**England** 218:14 471:1  
**enhance** 201:9 214:16  
**enhanced** 361:22  
**enormous** 46:18  
**enriched** 263:22  
**ensure** 7:13 12:15  
41:11,13 42:17 43:7  
54:7 59:2 93:19  
104:22 107:21 130:3  
136:11 138:1 156:19  
206:1 267:22 331:6  
**ensures** 11:3  
**ensuring** 42:4 52:16  
103:20 107:2  
**entered** 40:18,21  
**enterprise** 41:9  
**enterprise-wide** 205:22  
**enterprising** 148:4  
**entire** 119:8 122:9  
132:4 270:22 307:4  
377:15 453:5 462:22  
484:11  
**entirely** 202:13,14  
**entirety** 442:19 504:18  
**entities** 119:8  
**entitled** 217:5 445:6  
**entrepreneur's** 260:19  
**entrepreneurs** 148:6  
**entry** 211:11  
**environment** 29:4  
96:12 127:11 205:7  
253:10 311:17 322:17  
383:13 453:7 458:20  
485:6 499:2 508:1  
511:17 513:16  
**environmental** 138:7  
200:7 273:9 329:3  
333:22 337:13 352:5  
382:1,21 432:1 511:9  
**environmentalist** 511:6  
511:8 518:7  
**environmentally**  
508:11,20 510:6  
**environments** 207:3  
457:6  
**envy** 191:11  
**enzyme** 171:19  
**enzymes** 274:7  
**EPA** 42:14 46:4,9,9  
47:22 48:1,3 56:4,5  
124:6 296:18,20  
297:4 298:11,15,22  
300:15 301:8,11,14  
321:21 329:6 347:7  
375:16 378:15 392:17  
395:12,16 405:18  
408:15 411:16  
**EPA's** 46:4  
**EPA-labeled** 301:16  
**epicenter** 270:16  
**Eppley** 243:10  
**equal** 217:12 295:2  
448:9 469:17  
**equally** 90:11 114:13  
201:12 444:9  
**equate** 511:2  
**equipment** 271:11,19  
272:2,15 323:3,5  
537:12  
**equivalency** 113:14  
447:8  
**equivalent** 112:8  
186:12 333:12,17  
402:13 405:4 421:3  
447:7  
**erosion** 452:21 466:13  
**escape** 440:9  
**esophagus** 322:21  
**especially** 9:19 71:7  
100:3 112:20 144:15  
194:21 284:1 332:14  
338:22 379:11 391:9  
484:19 510:12 524:17  
**essence** 395:15 417:17  
431:15  
**essential** 102:9 126:9  
148:20 152:1 159:13  
168:8 170:18 190:4  
193:22 271:9 341:9  
342:7 354:21 356:4  
358:19 383:19 485:12

486:7  
**essentiality** 366:10  
**essentially** 131:2 132:8  
 163:8 514:7  
**establish** 103:17 430:1  
 475:14  
**established** 36:18  
 54:18,19 55:6 192:16  
 266:17  
**establishes** 54:11  
 104:12  
**establishing** 40:19  
**esteemed** 252:13  
**ester** 180:10,11,11,13  
 180:14 181:4,11,12  
 181:16,19,22 182:16  
 182:18 183:11 184:12  
 186:22  
**estimate** 135:9  
**estimates** 63:22 135:11  
 135:21 136:8  
**estimating** 254:6  
**et** 255:18 404:3 421:15  
 482:10 489:1 537:17  
**ETH** 274:2,13 275:1  
**ethanol** 64:5  
**ethics** 37:15  
**ethoxylate** 124:12  
**ethoxylates** 45:4  
**ethylene** 386:22 388:1  
**EU** 20:10 219:12  
**Europe** 160:20 163:3,5  
 163:12 188:21 189:1  
 219:5,7  
**European** 160:20 211:4  
 211:5 213:1 217:18  
 230:8,13 486:11  
**Europeans** 218:2,20  
**evaluate** 46:7,11 125:1  
 274:14 387:20 403:9  
 403:17 410:19  
**evaluated** 42:18 508:16  
**evaluating** 42:7,22  
**evaluation** 161:16  
 374:21 400:9,11  
**even-numbered** 222:3  
 222:10  
**events** 16:12  
**eventually** 36:19  
 145:20 146:3 284:15  
**ever-changing** 284:19  
**ever-increasing** 285:7  
**everybody** 8:3 77:17  
 259:5 261:8 264:13  
 289:19 292:6 329:22  
 427:21 428:1 442:2  
 474:12 476:15 493:19  
**everybody's** 127:22

203:15  
**everyone's** 320:1 506:4  
**evidence** 16:10 101:10  
 138:7 190:21 277:21  
 343:2 412:16  
**evident** 443:5 446:12  
 505:17  
**evolution** 111:14  
 229:22 510:5  
**evolutionary** 10:9  
**evolve** 284:14 453:22  
 484:20  
**evolved** 92:1 498:14  
**evolving** 83:2 90:15  
 289:9  
**exact** 11:1 166:4 209:19  
 503:10  
**exactly** 51:9 67:4 85:18  
 89:4 213:22 460:3  
 503:8,9  
**examining** 41:16 42:20  
**example** 12:10 35:9  
 45:5 60:13 64:2 70:20  
 74:10 104:10 107:7  
 124:11 125:1 135:11  
 202:12 271:14 277:19  
 301:13 394:17 435:10  
 481:10 485:7  
**examples** 41:18 44:13  
 45:10 85:11 119:11  
 150:19 268:6,10  
 421:11 448:19 449:6  
 452:3,5,15,22 478:2  
**exceed** 284:17 321:18  
**exception** 119:5 430:22  
**excess** 452:16  
**excessive** 123:20  
 452:14  
**exchange** 48:12  
**excited** 198:3  
**excluded** 4:5 103:15  
 106:4 109:3,7,8,11,16  
 109:17,20 111:11,18  
 118:18,21 119:12  
 121:6,10 122:3 123:2  
 123:4 196:16,20  
 197:2,4 255:16,19  
 256:4,7 265:18  
 267:17 268:7 335:16  
 339:11 443:21  
**Excluding** 203:1  
**exclusion** 119:6,17  
 443:22 509:7  
**exclusive** 201:3 401:5  
 444:16  
**exclusively** 103:9 266:6  
**excrete** 274:7  
**excuse** 18:22 28:3

357:17 358:22  
**executive** 53:17 121:17  
 159:3 200:5 210:9  
**exempt** 104:11 132:8  
 191:21 451:8,20  
 540:16  
**exempted** 192:3,7  
 347:6 434:2 441:14  
 538:7  
**exemption** 201:17  
**exemptions** 488:3  
**exercise** 316:8  
**exist** 70:10 305:14  
**existed** 156:7 509:4  
**existing** 105:2 117:22  
 161:12 200:18 203:4  
 507:5  
**exists** 162:10 193:22  
 236:3,5 502:10 514:1  
**expand** 57:21 83:4  
 145:10 221:17 285:16  
**expands** 43:2  
**expansion** 221:12  
**expect** 172:6 191:6  
 492:5 495:9  
**expectation** 164:17  
**expectations** 190:6  
 486:10 487:1  
**expected** 144:5 166:17  
 167:10 228:16  
**expecting** 22:13  
**expedient** 332:19  
**expensive** 69:20 186:1  
 223:11  
**experience** 19:3 21:10  
 23:19 24:6,9 27:3,4,6  
 140:12 205:18 210:19  
 229:9 485:22 486:15  
 513:19  
**experiences** 293:18  
**experiment** 485:19  
**experimental** 497:9  
**expert** 161:16 190:9  
**expertise** 105:21 408:6  
 412:3 509:4  
**experts** 134:5  
**expired** 5:19  
**explain** 11:22 73:9  
 157:20 244:6 496:3  
 503:14  
**explained** 32:9 75:20  
 118:7  
**explanation** 314:13  
**explicit** 473:17  
**explicitly** 224:16  
**explore** 132:20 528:16  
**exponential** 64:22  
**exporter** 212:15

**exposure** 227:4 230:5  
 322:18  
**express** 57:12 116:16  
 428:2  
**expressed** 90:10  
 333:16 362:10 463:3  
 478:3  
**expressing** 460:8  
**expression** 472:5  
**extend** 207:6  
**extension** 292:22  
**extensive** 114:9 119:11  
 258:15 288:22  
**extensively** 138:6 184:3  
 184:9 219:4 428:11  
**external** 38:1 372:3  
**extra** 70:1 112:22 188:2  
 422:12  
**extract** 102:6  
**extracted** 179:20  
**extraction** 102:10  
 177:19 178:4 352:1  
**extracts** 102:3 351:12  
**extremely** 5:11 68:3  
 137:6 186:1,3 202:8  
 207:7 347:22  
**extremes** 36:14 510:1  
**eye** 152:15 322:19  
**eyes** 23:3 145:7 249:15

---

**F**


---

**fabric** 90:17  
**face** 151:12 215:8 227:5  
 285:5 486:5,6 524:15  
**facilities** 14:3 341:7,18  
**facility** 192:5 205:17  
 206:9,16 207:7,14,15  
 239:11 332:16 452:21  
**facing** 94:21 155:9  
**fact** 13:19 84:1 95:21  
 98:14,18 137:18  
 152:1,14 191:2  
 258:21 293:9 307:21  
 311:21 312:16 313:13  
 317:18 363:1 365:3  
 378:14 392:13 404:7  
 407:11 412:17 462:6  
 469:2 483:18 494:1  
 509:11 523:9  
**facto** 430:9  
**factor** 69:9 84:13 87:22  
 227:2 491:7 507:22  
 519:14  
**factories** 11:5 96:5  
**factoring** 107:11  
**factors** 90:19  
**factory** 95:1  
**facts** 135:1 160:14

239:15  
**faculty** 18:15  
**faded** 21:13  
**Fahrenheit** 401:12,22  
 402:16 405:13,15  
**fail** 417:20 523:22  
**failed** 39:19 488:9  
**fails** 326:5 327:4 328:2  
 335:6 340:9 344:10  
 346:18 350:1 351:5  
 354:3 357:13 360:13  
 368:12 370:18 373:17  
 386:11 399:2 418:17  
 527:11 537:1 539:8  
 541:15  
**failure** 212:17  
**failures** 55:13  
**fair** 29:16 75:14 137:10  
 217:6 264:7 393:21  
 504:11  
**fairly** 49:1 143:8 258:5  
 278:18 330:17 336:8  
 488:4 524:7  
**faithful** 49:1  
**fall** 1:5 13:15 100:22  
 124:8 428:18 460:14  
 533:18  
**fallen** 215:1  
**falling** 125:17  
**falls** 523:8  
**familiar** 180:5 232:6  
 286:5 300:12 389:16  
**families** 180:6 183:19  
**family** 69:17 88:11  
 95:13 123:7 154:12  
 173:2 187:7 225:11  
 393:2 535:3  
**family's** 96:11  
**family-** 303:8 461:21  
**far** 12:16 14:7 21:13  
 32:19 33:13 45:14  
 47:5 146:12 158:7,17  
 185:2 197:18 260:15  
 283:17 284:21 306:20  
 315:21 446:18 461:21  
 462:15 519:16  
**far-fetched** 519:20  
**farm** 2:10,12 3:8,8 12:7  
 12:11 13:1 18:12  
 19:11 38:10,20 57:3,7  
 59:2 60:17 72:15 79:4  
 95:2 106:8 138:15  
 150:1 154:7,11 173:1  
 173:3,12 198:21  
 199:1,18 201:5  
 202:12,17 205:1,2,9  
 205:18 207:22 219:16  
 228:2 240:11,11

243:10 245:4 246:1,2  
 250:2 286:11,19  
 287:4 393:11 410:16  
 421:10 424:16 466:22  
 468:22 469:1 474:19  
 474:19 476:2 479:4  
 490:19 503:3 504:2,5  
**farm-generated** 467:15  
**farmed** 240:12 477:5,6  
**farmer** 67:17 72:17 74:5  
 77:14 125:22 128:8  
 149:6 203:11,11,12  
 219:17 242:16 245:3  
 252:14 285:2,4,12  
 286:9 287:14 309:15  
 391:2 435:18 460:10  
 462:5,6 465:6 474:6  
 496:21 504:6  
**farmer's** 36:6 38:20  
**farmer-owned** 210:12  
**Farmers'** 210:9  
**farming** 8:6,14 9:6,9  
 10:1,8 18:20,20 27:1  
 27:6,10 28:3 31:10,17  
 37:1 39:19 58:10 63:1  
 66:17,21 95:14  
 123:16 140:19 199:9  
 201:18 205:4,6,14  
 207:2 208:6 240:13  
 285:19 291:3 391:6  
 430:14,15 431:21  
 447:10 456:18 461:19  
 462:1 464:2 473:3,8  
 473:15 474:5 477:16  
 483:6 501:2,6 507:6  
 518:12,14  
**farmland** 474:19 485:14  
 485:16  
**farms** 2:15,22 27:18  
 31:22,22 50:2 56:16  
 63:3,5,9 98:18 139:3  
 200:6 201:11,13,14  
 202:6,7 203:2,16  
 210:16 225:12 226:11  
 227:18 243:4,6,11  
 286:20 390:18 410:14  
 421:20 460:14,20,22  
 461:4,8 470:20  
 474:16,18 483:2  
 496:9,10,12 509:10  
**farmstead** 328:12  
 330:12  
**fashion** 80:11 254:20  
 527:15  
**fast** 81:6 245:5 486:20  
**faster** 113:22  
**fastest** 506:9  
**fat** 169:2 171:14 194:19

**fate** 273:9 274:3 276:2  
**father** 499:22  
**fathers** 231:21 233:2,14  
 234:1  
**fatty** 4:17 221:20 222:3  
 222:5,10,11,16,19,21  
 241:4 246:12 247:6  
 291:12,22 296:8  
 297:3 301:12 328:18  
 328:19 374:4,9,16  
 375:6,11,13,16,19  
 378:1 385:13 392:3  
 396:19 398:1 401:18  
**fault** 292:7  
**favor** 227:12 258:13  
 268:4 323:6 329:1  
 342:7 364:20 423:20  
 424:7 517:3,17,18,20  
 523:1  
**favorable** 290:19  
**favorite** 307:9  
**Fazio** 219:22  
**FDA** 56:4,5 227:22  
 305:10 308:18 310:8  
 310:12 311:8,12  
 403:13,22 408:15  
 411:16,20 413:13  
 414:15,15  
**FDA's** 403:15  
**fear** 289:21 488:12  
**features** 90:22  
**fed** 154:1 174:5 304:16  
 458:21  
**federal** 2:6 82:17  
 228:19 264:17 265:2  
 270:3  
**feed** 43:6 60:11,14 61:5  
 62:2 174:9 202:20  
 215:21 218:14 229:15  
 229:16 305:2,18,19  
 458:4 500:4  
**feedback** 64:21 85:18  
 140:2,4 523:20  
**feeding** 59:11 61:14  
 63:20 88:16 89:6 95:2  
 95:2 123:13 124:20  
 191:9 304:1 305:8,10  
 409:10 433:18,21  
 434:6 435:2 441:6,11  
 464:20,21 470:11  
 478:6 537:22 538:4  
 539:21 540:8,13  
**feeds** 317:9  
**feedstock** 335:15  
 339:11 371:21 409:9  
 420:4  
**feedstocks** 306:17  
 371:15 404:3 416:2

**feel** 51:20 52:1,2 53:6  
 72:19 76:15 113:1  
 126:22 150:11 203:22  
 209:1 261:12 319:7  
 333:8 376:19 384:8  
 421:17 444:20 459:14  
 459:16 460:10 462:17  
 463:6,15 464:6 470:7  
 470:13 491:1,7,16  
 492:22 506:22 507:13  
 509:6 510:2 527:5  
 535:12  
**feeling** 377:7  
**feelings** 15:12  
**feels** 192:14 480:4  
 505:8  
**feet** 476:11  
**Feldman** 2:16 49:18  
 53:14,16,17 514:4  
**fellow** 208:9 298:7  
 333:15 463:12 476:18  
 493:21 520:8  
**felt** 69:13,16 80:3  
 120:11 260:5 294:2  
 295:3,15 297:16  
 300:1 303:3 336:13  
 355:3,7 378:18  
 421:19 423:1 457:9  
 458:12 478:7 519:7  
**female** 148:16  
**Ferguson** 475:3,4  
**Ferrara** 2:13 126:9  
**fertility** 10:18 13:3  
 14:18 15:8 190:22  
 278:22 406:6 417:10  
 431:4 457:1 483:22  
 484:1,3,8,12 501:20  
**fertilize** 19:6  
**fertilizer** 11:1 205:20  
 206:5,8 207:4 242:17  
 304:11 307:21 431:6  
**fertilizers** 19:8 27:14  
 124:22 125:2 362:7  
 446:16 465:21 468:6  
 500:2,12  
**fiber** 401:3 402:3  
 406:10,19  
**fibroblast** 250:9  
**field** 4:20 76:3 105:6  
 124:22 134:6,10  
 217:8,9 224:22  
 273:14 295:8 336:22  
 389:12 393:21 458:16  
 464:4,11  
**field-grown** 457:6  
 468:20  
**fields** 104:19 290:6,10  
 290:11,14,15 388:5

389:19 391:8 495:4  
**fiercely** 233:17  
**Fifteen** 367:9 397:18  
 417:4 427:4  
**fifth** 454:21  
**fight** 35:2 285:7 528:20  
**figure** 79:8 112:7  
 171:20 188:9,13  
 236:4 318:12 502:11  
 528:21  
**figured** 21:5 310:8  
**figuring** 90:16  
**file** 298:21  
**filing** 449:13  
**fill** 8:17 89:15  
**filled** 241:9 295:7  
**fillings** 162:8 181:8  
**film** 4:10 273:8,18  
 274:5,18 275:4,13,16  
 276:3,7,12 277:17,20  
 278:2 279:10 335:8  
 335:14 338:11 339:8  
**films** 277:21  
**filtered** 173:8,18 206:21  
**filtration** 206:18 256:6  
**final** 41:5 101:4 123:18  
 124:1 125:13 150:15  
 166:17 167:8,9,11,13  
 245:17 263:8 362:4  
 399:20  
**finalized** 150:7  
**finally** 53:3 124:4  
 140:13 160:18 162:13  
 257:10 453:15  
**financial** 79:14  
**find** 17:5 31:13 44:16  
 45:19 49:3 87:8 92:10  
 107:7 118:16 128:15  
 132:16 172:6 176:1  
 195:13 230:14 261:1  
 261:22 285:12 291:2  
 413:19 435:7 448:7  
 454:7 456:6 472:10  
 474:21 488:3,5  
 489:22 500:22 502:12  
 510:20 514:10,13  
**finding** 195:11 337:6  
 348:11  
**fine** 84:17 142:1 363:20  
 374:2 533:13  
**finger** 200:12 414:17  
 481:8  
**finish** 5:20 21:11  
**finished** 165:22 170:13  
 296:4  
**Fipronil** 230:10  
**fire** 55:21 155:8,9  
 216:15 271:20

**fires** 55:22 514:5  
**firewall** 72:15 80:3  
**firm** 186:21 187:17  
**firmly** 382:9  
**firsthand** 99:22 292:14  
 295:18  
**fish** 13:3 22:11 39:19  
 125:3 206:6,7,10,14  
 206:16,17 245:21  
 449:8  
**fits** 141:22 439:5  
**five** 55:16 236:3 261:21  
 275:9,11 276:13  
 282:1,2 339:3 393:3  
 422:8 439:6,7 440:7  
 459:9  
**fix** 85:19 114:16 122:22  
 263:2 278:21  
**fixation** 501:14,19  
**fixed** 4:12 346:20 347:5  
 348:21 350:6,7  
**flag** 493:3 495:12  
**flags** 314:11  
**flaming** 223:9  
**flavor** 100:3,5 170:7,13  
 311:3  
**Flavorganics** 3:13  
 99:14 100:4 101:20  
 101:22 102:3  
**flavors** 100:6,7,13,17  
 100:18 101:1,5,7  
 164:22 260:12  
**fleas** 227:6  
**fleeting** 514:1  
**flexibility** 57:19,22  
 115:9,19 195:17  
 453:20  
**flexible** 183:13  
**flies** 305:8  
**flip** 496:17  
**flock** 229:8 310:18  
**flocks** 228:3 229:10  
**flooded** 498:4  
**floodplain** 290:22  
**floor** 207:6  
**floored** 245:3  
**floors** 537:17  
**Florida** 1:8,9 3:7 205:3  
 240:9 242:13 384:13  
**flour** 162:14,19 165:3,5  
 257:4 261:9,13  
**flow** 38:3 401:16  
**flower** 375:14  
**flowering** 387:1  
**flowers** 361:16 394:22  
**flows** 206:17 401:22  
**fluid** 194:2  
**fluidity** 111:14

**fly** 304:1,16 305:4,21  
 306:2 308:11,11,14  
 308:15 310:21 311:16  
 377:21  
**flyers** 248:2  
**focus** 10:22 16:19  
 50:17 97:13,14 108:2  
 113:7 122:21 182:16  
 193:16 216:10 267:21  
 378:21 379:1 451:22  
 478:9 487:20  
**focused** 39:5 434:4  
**focuses** 52:16 55:21  
 118:9 161:12 487:20  
**focusing** 110:13 270:6  
 448:11  
**fodder** 434:1 441:13  
 450:5 538:6 540:15  
**fold** 318:8 319:21  
**foliage** 239:2  
**foliar** 361:12  
**folks** 5:11 7:12,16 9:2  
 47:12 48:4 78:17  
 87:14 138:17 144:19  
 203:15 391:20,21  
 487:7 511:2  
**follow** 17:16 55:13 73:5  
 74:5,6 98:7 199:6  
 218:10,20 228:2  
 274:3 403:21 412:6  
 420:3 428:3 474:13  
 488:13 528:8  
**follow-up** 240:1 275:2  
**followed** 5:5 18:7 35:21  
 40:4 49:17 53:15  
 56:18 70:19 80:21  
 93:10 99:7 102:19  
 107:16 116:10 121:13  
 129:16 133:10 138:12  
 142:10 146:18 149:20  
 153:20 158:22 167:17  
 172:20 176:22 179:10  
 182:3 189:9 193:3  
 196:3 200:2 210:7  
 221:1 225:4 231:9  
 240:6 253:21 265:11  
 269:17 282:17 291:9  
 302:12 471:19  
**following** 155:20  
 204:19 205:19 237:11  
 343:11 366:6 401:6  
 403:12 482:17  
**follows** 141:3 385:8  
 426:4 447:9  
**foodborne** 404:11,13  
 406:17  
**foods** 3:5 94:11 96:10  
 163:7 164:8 167:5

168:6,7,9 169:3,3,8  
 169:19 170:13,19,21  
 193:6 195:10 447:3  
 475:12 491:19 520:15  
**fooled** 96:8  
**foolish** 39:7  
**foot** 173:13  
**footprint** 496:7 497:17  
 508:21  
**footprints** 62:22 63:11  
**footsteps** 488:13  
**forage** 435:20  
**force** 19:1 25:13 32:4  
 35:6 53:20 57:17  
 115:12 155:19 178:18  
 179:7 200:8 204:7  
 208:18 302:19 303:5  
 306:7 429:8,20 430:7  
 431:11 434:4 443:15  
**forced** 114:19  
**foreign** 9:14 217:16  
**foremost** 54:7 139:7  
**foresee** 232:11  
**foresight** 233:8  
**forever** 526:12 528:20  
**forget** 180:4  
**forging** 514:8  
**forgot** 340:11  
**form** 22:9,15,15 77:8  
 102:16 103:18 123:8  
 140:9 170:4 194:10  
 194:10 206:9 223:2  
 231:22 288:7 303:18  
 342:15,21 431:17  
 440:13,14 496:14  
**formal** 5:6 106:2 109:14  
 292:4  
**formalized** 303:17  
**formally** 291:21  
**former** 40:11  
**formula** 190:1,4  
**formulas** 39:10  
**formulate** 152:22  
**formulation** 155:8  
 364:2  
**formulations** 342:1  
**formulators** 169:20  
**forth** 24:4 62:16 76:7,10  
 146:12 224:22 239:2  
 300:9,12 428:19  
 440:11 442:22 486:17  
 518:21 519:4  
**fortified** 181:18  
**fortune** 495:4  
**forward** 35:4 44:2 53:9  
 58:17 64:22 104:2,10  
 107:12 115:19 116:7  
 118:9,16 121:4 124:7

142:3 145:2 152:7  
 153:11 165:4 226:21  
 245:6 256:1 267:15  
 293:5 365:22 396:3  
 399:15,16 429:1,5  
 481:10,15 482:5  
 487:3 488:10 489:11  
 525:18 532:13  
**forwarded** 257:21  
**fossil** 280:1,10,12  
**fossilized** 352:4  
**foster** 406:5 447:11  
 484:2  
**fostering** 51:1 59:3  
 103:4 130:11  
**fouling** 166:11  
**found** 161:18 162:8  
 166:21 170:3 172:1  
 190:3 207:2 214:1  
 235:19,20 293:3  
 304:4 337:5 431:19  
 447:18 485:21 516:15  
 517:9 534:7  
**foundation** 37:15 79:17  
 79:21 94:21 140:19  
 445:22 447:8 457:17  
 461:11 493:15 505:19  
**foundational** 447:9  
 458:3  
**founded** 123:12  
**founders** 507:6  
**founding** 93:22 231:21  
 233:2,14 234:1  
**four** 53:19 88:21 189:20  
 211:17 266:2 267:3  
 287:12 304:12,21  
 453:1,11 454:15  
 455:4,10 521:15  
 533:12  
**four-one-three** 425:6  
**fourth** 449:14  
**fowl** 230:7,17  
**fracking** 141:21  
**fraction** 277:15 324:9  
 439:9,11 505:7  
**fragile** 514:8  
**fragment** 277:22  
**fragmented** 186:2  
**fragments** 274:8,8  
 276:19  
**frame** 338:16  
**framed** 17:8  
**framework** 109:6  
**Francis** 1:19 21:7 60:6  
 60:7 67:2 70:13 83:17  
 155:13,15 241:20  
 261:17 264:5 320:17  
 321:4 324:5,15 325:9

326:7 327:6 340:16  
 343:13 347:2 349:4  
 357:14 358:1 359:11  
 367:18 368:18 369:20  
 376:7 387:5 408:22  
 419:12 423:18 426:8  
 427:6 445:4 494:22  
 534:11 538:8 541:20  
**Francis'** 442:15  
**frank** 292:16  
**Frankel** 2:16 182:4  
 189:9,12,13 192:21  
**frankly** 314:17 498:12  
 515:1 517:22  
**fraud** 95:22 118:22  
 122:5 210:19 211:7  
 211:20,22 212:16  
 213:1 214:11 215:13  
 216:4 217:2 315:7  
**fraud-proof** 93:20  
**fraudulent** 197:19  
 218:19 313:21  
**frayed** 480:13  
**Fred** 244:17,18  
**free** 240:19 244:9,11  
 247:16 308:22 316:11  
 316:21 318:4 505:12  
**freedom** 234:11 316:9  
**freeze** 310:22  
**fresh** 116:14 117:13  
 179:4 438:12 475:6,9  
 491:21  
**Friedman** 243:7  
**friend** 291:20  
**friendly** 56:14,15  
 317:20  
**friends** 68:4,6 439:20  
 471:3  
**fringe** 286:12  
**frog** 466:21 515:19,20  
**frogs** 449:7 454:22  
 515:21  
**front** 29:17 45:10 56:7  
 91:5 199:3,5 245:16  
 248:2 507:15  
**fruit** 36:20 162:8 181:13  
 181:13,17,18 183:21  
 183:22 184:16,16  
 185:19 186:15 191:17  
 270:16 271:5,12  
 272:6,21 308:15  
 435:13  
**fruit-based** 180:2  
**fruits** 179:18  
**frustrated** 476:21  
**frustrating** 52:1  
**FSA** 143:21  
**FSMA** 271:13 332:15

411:20  
**fuel** 202:19  
**full** 7:1 91:18 96:5  
 100:21 176:6 216:14  
 261:7 292:5 376:15  
 421:18 440:11 493:8  
 501:5 507:4  
**full-time** 313:4 501:3  
**fully** 10:18 20:9 30:12  
 206:15 207:11 463:7  
 463:14 470:8 489:8  
 509:20,21  
**fumigate** 290:14  
**fun** 449:15  
**function** 161:1 164:2  
 166:19 171:20 183:15  
 448:17 504:3  
**functional** 178:2 194:4  
 195:14 499:14  
**functionality** 168:8  
 170:6  
**functions** 37:22 162:14  
 164:15 452:1  
**fundamental** 387:19  
**fundamentally** 273:12  
**funded** 309:7  
**funding** 303:21  
**fungi** 39:15  
**fungi** 10:10 37:7 174:11  
 275:5,11 431:19  
 438:10 447:14 448:22  
 449:4 452:13 499:12  
 515:21  
**fungicides** 173:10  
**fungus** 251:16  
**funguses** 249:17  
**funny** 318:21  
**further** 6:9 14:22 25:6  
 38:19 82:1 95:12  
 111:18 118:14 143:3  
 150:13 157:17 228:11  
 267:15 405:21 407:5  
 425:15 428:4,21  
 439:3 445:5,11 446:2  
 446:17 447:3,22  
 449:17 450:21 451:19  
 453:19 489:12 523:3  
 533:9 535:18 537:4,7  
**Furthermore** 190:21  
 434:16  
**fusion** 123:7  
**future** 37:9,15 109:15  
 121:10 173:15 228:22  
 232:10 233:12 243:16  
 256:2,19 283:16  
 285:10,14,21 317:13  
 319:10 342:5 371:20  
 403:18 408:10 446:4

446:6 528:22

---

**G**


---

**G** 38:18  
**Gaia** 145:9  
**gain** 106:8 309:21  
**gained** 477:9  
**gallery** 254:2  
**game** 77:1 79:8  
**gap** 148:5  
**gaps** 111:1 147:15  
 332:15  
**garden** 471:7  
**gardeners** 8:10 174:3  
**gardens** 240:11 475:14  
**gas** 139:2 497:2  
**gastrointestinal** 322:20  
**gather** 75:8 131:21  
**gathered** 231:22  
**GE** 38:15 365:1,3  
**gel** 162:6 180:18,18  
 181:2,3 183:11,12,17  
 342:1,15,20  
**gelatin** 184:11  
**gelatin-free** 181:9  
**gelation** 179:21 180:17  
 181:7,11  
**gene** 130:15 243:10  
**general** 12:9 63:4  
 141:21 161:11,21  
 193:13 211:2 222:15  
 257:20 302:15 323:11  
 352:6 483:7  
**General's** 218:11  
**generalizations** 202:9  
**generally** 10:19 109:9  
 130:19 195:4 287:3  
 288:15 328:18 379:10  
 487:14  
**generated** 442:13  
**generation** 285:17  
 480:21  
**generational** 292:15  
 507:6  
**generations** 474:20  
 475:13  
**genesis** 506:6  
**genetic** 38:16 42:3  
 108:6,9 422:13,22  
**genetics** 150:19 151:11  
 151:19 152:4 309:6  
**gentleman** 29:17  
 211:12  
**gentlemen** 254:2  
**genuine** 226:22  
**geographic** 106:18  
**geography** 460:5  
**Gerald** 3:11 273:4

281:16,21 282:2,16  
282:17  
**germination** 173:17  
**Gerry** 283:2  
**getting** 139:8 171:22  
257:4 262:5 304:10  
305:3 314:20 438:14  
477:18  
**gift** 233:14,15 234:3  
**gifts** 39:9  
**give** 58:17 60:21 62:19  
65:17 68:21 85:11  
87:20 101:14 172:11  
174:1 176:13 184:13  
184:17 187:16 234:10  
239:4,8,22 240:22  
241:13 242:9 243:13  
246:17 279:13 290:4  
305:5 315:5 320:22  
321:3 338:21 356:8  
377:17 424:6 448:8  
460:17 476:15 505:11  
520:6 523:14  
**given** 62:1 81:4,13  
114:12 150:10 151:5  
189:22 281:18 304:14  
452:22 476:18 504:16  
520:6 523:19  
**gives** 130:15 164:19  
183:15 186:21 472:4  
**giving** 136:19 239:14  
239:15 246:4 481:7  
**glad** 21:18 101:3 150:4  
**glaring** 206:3  
**Glen** 243:6  
**global** 145:10 159:5,12  
177:8  
**globally** 43:5  
**glossary** 531:10  
**GMO** 157:5 266:8  
422:19 425:10 467:11  
468:17  
**GMOs** 33:10 94:10  
109:4 482:18 491:18  
500:11  
**go-to** 307:9  
**goal** 82:12 83:16  
111:17 117:20 131:12  
131:15 501:19,21  
**goals** 59:1,7,10,13,14  
59:16,17 110:9  
208:18 452:1  
**God** 70:2  
**Goldberg** 2:17 282:3  
302:13 312:6,10,11  
**goods** 80:16  
**gotten** 188:6 314:12  
383:16 505:18

**government** 37:4 38:12  
55:13,17,19 135:6  
138:1 201:3 218:8  
231:22 471:11  
**grad** 499:20  
**grader** 57:11  
**gradually** 289:9  
**grafting** 296:16,17  
**grain** 17:10 210:13  
211:19 212:9,12  
213:18 214:20 216:1  
216:13 218:19 318:13  
436:7  
**grains** 43:6 215:22  
313:22  
**grams** 277:6  
**grandfather** 24:11  
**grandmother** 474:2  
**grant** 302:10  
**granted** 491:2  
**granular** 20:22  
**graph** 169:9,13 172:15  
438:4,7  
**graphic** 449:11  
**grass** 21:1 305:1 330:6  
330:18 331:16 436:8  
**grassroots** 138:15  
**grateful** 108:5 117:4  
151:3  
**gravel** 24:11 330:18  
331:15,18,20,21,22  
**gravity** 401:16  
**grazers** 449:3  
**grazing** 199:10 435:18  
**greater** 146:4 163:6  
457:21 462:15 465:2  
467:4,19 469:1  
497:17  
**greatest** 477:15  
**greatly** 117:14 266:18  
419:20 495:7  
**green** 2:17 5:17 169:12  
291:11 374:15 500:1  
**greenhouse** 4:20 11:17  
12:4 19:5,6 23:6  
24:12 28:16 29:6  
30:22 35:9,12,15  
88:18 206:16 331:15  
332:4,8 452:20 455:8  
473:11 497:2  
**greenhouses** 19:4  
23:19 28:19,21,22  
30:11,12,21 71:1  
428:13 472:12 489:2  
**greens** 3:8 173:1  
469:22  
**grew** 56:3 154:10 461:1  
461:1,2 498:1 508:22

**grievances** 316:14  
**groan** 522:14  
**Grocers** 512:5  
**grocery** 74:10 75:9  
475:7,9  
**grossly** 296:2  
**grouchy** 319:9  
**ground** 20:11 36:22  
77:16,18 116:6  
117:17 128:9 200:13  
201:10 205:14 207:2  
288:1 332:14 430:21  
439:22 448:10 459:7  
463:5 498:8 503:12  
510:17 515:7  
**groundtruthing** 135:9  
**groundwork** 219:19  
**group** 46:20 54:16  
120:11 127:8 201:1  
231:21 235:6 267:19  
303:18 309:20 321:7  
375:9 445:13 512:17  
**groups** 304:12,14,15  
336:12 420:20 499:14  
514:17 524:12  
**grow** 12:11,12 20:13  
21:1,11 23:4 27:13,20  
36:12 72:2 80:15  
88:15,16,20 115:1  
127:2,12,13 173:3,16  
174:9,12 200:13,16  
200:18 202:17 233:16  
236:14 240:16 246:8  
246:8 279:1 283:4  
304:8 309:15 311:12  
318:2 383:9 444:4  
456:19 460:5,6 491:3  
498:8,15 501:20  
505:13 509:16  
**grower** 8:5 36:8 51:13  
70:21 74:2 285:3  
431:22 480:21 485:20  
501:2,5,16,20  
**growers** 3:7 10:20 15:7  
19:6 27:17 68:17,17  
71:7 72:10,20 73:4  
75:11 83:12 87:15,15  
87:17 88:11 90:8  
108:10 110:5 112:13  
113:8 114:10 116:18  
117:1 118:4 128:10  
128:18 130:13 132:18  
191:1,8,18 201:20  
203:5 234:10 240:10  
241:6 245:22 246:12  
247:13 266:5,7 267:7  
269:21 270:9 271:12  
272:6,13 292:10,19

297:21 331:2 335:22  
351:19 355:1,5  
362:18,22 384:13,14  
435:6 436:19 437:2  
477:15 488:20 489:21  
502:15 504:15,16  
**growers'** 269:8  
**growing** 9:11 10:15  
29:19 74:6 83:20 84:3  
84:5 89:20 92:13,18  
94:22 103:22 123:12  
128:9 130:17 132:5  
173:5 192:4 201:13  
221:13 223:7,13  
231:13 232:19 233:9  
234:7,11 245:10  
246:9,20 283:11  
292:15 304:6,9  
308:19 312:14,18  
330:19 388:22 389:16  
389:20 391:4 427:14  
446:10 447:17,19  
451:6,7 452:6,20  
453:8,12 457:7 459:7  
460:6 461:4 463:9  
477:20,21 483:18  
484:10 487:15 499:2  
504:4 509:10 511:15  
537:13  
**grown** 20:10 61:15  
74:12,14 82:12 85:1,1  
85:11,12,12,21,21,22  
89:21 95:20 127:13  
128:2 132:19 179:3  
190:13 191:22 192:1  
209:12,16 214:21  
234:4 235:11,12  
237:22 287:11 387:10  
392:21,22 403:14  
430:21 432:21 451:14  
460:15 492:4 508:19  
532:16  
**grows** 41:1 176:15  
202:13 311:13 490:3  
**growth** 24:19 65:1  
101:6 148:9 150:20  
243:20 304:18 361:22  
364:17 375:17,21  
382:10 386:19,20  
394:9,9,12,19,20,22  
401:14  
**guarantee** 154:19  
**guaranteed** 500:8  
**guarantees** 404:6  
**Guatemala** 471:1  
**guess** 47:11 64:8 66:8  
71:20 192:6 217:10  
246:22 259:22 268:22

323:20 334:4 339:6  
 359:6 364:7 372:15  
 381:18 386:12 390:12  
 394:8 395:20 408:22  
 425:21 430:19 466:3  
 518:14 523:1 530:19  
 535:18 537:8,11  
**guidance** 4:18 110:2  
 111:13,17 112:3  
 115:8 118:19 119:15  
 130:7,21 198:5  
 217:20 255:6,12,22  
 256:15 265:17 268:16  
 278:12 412:20 420:15  
 422:17 430:4  
**guide** 55:6,14 113:5  
 472:4  
**guidelines** 59:1  
**guiding** 155:16  
**guilty** 9:16  
**gummy** 129:5,5  
**gutters** 88:17  
**Gwendolyn** 3:15  
 248:10 253:21 254:3  
 257:14 264:6

---

**H**


---

**H** 471:16  
**habitat** 330:20 439:12  
 465:11,13,14  
**habitats** 144:14  
**HACCP** 208:3  
**haiku** 319:7  
**half** 70:21 142:16  
 172:17 520:19,21  
**halfway-done** 424:18  
**Hall** 499:22  
**Hall-Beyer** 312:19  
**hallmark** 456:7  
**hammering** 217:21  
**hand** 86:3 223:9 334:3  
 377:11 381:9 387:8  
 389:9,18 393:5,18,20  
 525:21 526:5,22  
**hand-signed** 313:16  
**Handbook** 435:6  
**handful** 363:15  
**handing** 320:16  
**handle** 325:4 450:18  
**handled** 411:9  
**handler** 119:17 132:8  
 267:9  
**handlers** 4:6 118:18,21  
 119:4,12 120:15,17  
 121:10 132:17 138:20  
 267:8,18,22  
**handling** 99:17 101:15  
 102:14 126:19 147:17

148:6 159:8 162:4  
 196:12,17 208:1  
 270:12 322:14 341:18  
 473:3,4,16 483:20  
**handpicking** 382:12  
**hands** 216:22 238:7  
 477:19  
**hanging** 517:2  
**happen** 20:5,6 28:3,4,6  
 30:21 31:1 146:7  
 209:15 212:19 219:10  
 245:14,14 259:2  
 329:7,20 345:6  
 524:14  
**happened** 26:2 259:11  
 292:9 295:6 314:3,6  
 315:2,6 380:16 407:8  
 494:12 517:10  
**happening** 126:2  
 391:14 501:7  
**happens** 175:2 239:9  
 274:4 439:19 468:17  
 476:5  
**happy** 47:10 91:17  
 121:9 141:10 152:21  
 236:11 237:6 242:9  
 306:13 489:11 520:7  
 521:4  
**hard** 11:10 50:12 53:5  
 66:7,11 81:6 86:1  
 94:1 95:5 96:17  
 226:11 253:3 257:4  
 290:22 291:16 295:10  
 309:14,15 332:22  
 391:20 469:12 499:19  
 523:19  
**hardest** 434:12 506:10  
**Harding** 2:17 282:2,17  
 291:8,10,11 295:5  
 296:10,14 297:6,15  
 298:18 299:7,12,16  
 299:20 300:3,11  
 301:18 302:9  
**hardship** 75:5,16  
 362:11  
**Harlem** 498:2  
**harm** 43:2 75:9  
**harmful** 38:4 82:13  
 322:16 491:18 492:3  
 492:8 511:15  
**Harriet** 1:13 28:12 31:5  
 39:21 43:22 86:4  
 88:13 111:9,20,22  
 141:6,11 162:22  
 163:16 175:20 176:4  
 178:17 187:12 214:6  
 244:2 246:5 261:16  
 268:14 278:7 279:7

294:14 298:3 299:20  
 306:14 323:15 330:13  
 333:19 335:8,20  
 339:12 341:5 342:11  
 343:12 354:17 356:11  
 356:16,19 358:13  
 359:15,17 367:15  
 369:10 371:5 372:20  
 376:2 378:8 379:20  
 383:7 392:11 409:18  
 412:7,18 413:18  
 416:5 420:15 426:7  
 427:19 454:10 455:20  
 459:10 463:20 464:10  
 464:12 470:12 478:4  
 506:20 520:3 521:14  
 522:11,15 524:5  
 526:22 527:8 531:3  
 533:3 536:3 540:21  
 541:20  
**Harriet's** 470:17  
**Harsh** 2:18 99:7 102:19  
 102:21,22 106:14,22  
**harvest** 29:11 104:18  
 105:14 106:19 135:15  
 136:2,6 137:4,13  
 138:2 246:22 272:1  
 388:6 407:20 413:4  
 414:2  
**harvested** 28:1 105:12  
 105:16 107:3 136:14  
 137:20 138:6 270:21  
**Harvesters** 136:8  
**harvesting** 134:12  
 135:5 136:9,10,21  
 137:3,11 295:8 388:7  
 473:12  
**hasty** 377:3  
**hat** 68:10 70:15 517:2  
**hatched** 311:17  
**hatches** 308:12  
**hate** 526:11  
**Hawaii** 154:8 155:2,9  
**hay** 21:1 436:7  
**hazards** 271:8  
**HDPE** 173:17  
**head** 66:7 239:5  
**head-scratchers**  
 191:17  
**headed** 109:5  
**heads** 496:20  
**healing** 250:10  
**health** 37:14 82:10,11  
 96:11 98:18 103:12  
 160:3 161:20 248:15  
 248:16 250:19,20  
 271:8,17 322:17  
 372:1 388:4,9 404:10

406:5,17 447:11  
 466:10 468:11 499:7  
**health-** 161:12  
**healthier** 16:22 69:13  
 96:12  
**healthy** 69:16 127:14  
 127:15 138:18 154:14  
 209:21 284:20 456:21  
 490:19,20,21  
**hear** 6:15 21:19 25:21  
 31:7 71:18 76:6,10  
 131:19 145:1 153:7  
 175:14,15 202:8  
 238:15 241:18 259:15  
 292:13 293:17 295:18  
 297:19 298:1 314:11  
 315:1 362:6 384:14  
 407:5 462:4 493:14  
 504:15 518:20  
**heard** 14:7 26:13 28:6  
 33:17 34:15 54:10  
 62:15,18 78:14 81:10  
 87:14 97:18 100:11  
 120:4 122:12 139:13  
 215:20 231:14 242:8  
 261:9 288:9 291:16  
 292:10 314:7 331:1  
 372:1 379:4 383:15  
 429:10 437:15 438:5  
 459:20 462:2 477:10  
 485:18 486:3,4  
 489:22 491:4 495:14  
 500:11,12 511:1  
 524:1,3,5  
**hearing** 11:16 97:19  
 98:13 260:3 268:12  
 293:1 384:16 391:20  
**heart** 10:5 256:16  
 459:16 470:15 474:13  
 474:13 500:13  
**heat** 29:6,6 36:17 88:18  
 401:12,20 403:6  
**heated** 28:22 401:11  
 413:2  
**heating** 403:7 405:4  
 452:11 478:20 488:21  
**heavy** 194:2  
**hedgerows** 51:6  
**heirloom** 202:14  
**held** 10:19 90:11,19  
 94:12 122:22 267:9  
 401:21  
**hello** 149:22 172:21  
 465:4,17  
**help** 18:18 25:7 26:5  
 44:7,11 47:7,10,16  
 48:9 55:14 83:10  
 112:10 113:13,18

115:8 121:10 147:14  
 154:22 155:8 167:12  
 174:14 189:17 207:9  
 219:18 227:4 251:1  
 285:12 377:18 449:11  
 475:20 500:4 511:9  
 511:16 535:8  
**helped** 19:5 24:10 94:8  
 393:11 444:3  
**helpful** 49:8 129:13  
 266:11 400:19  
**helping** 110:5 112:15  
 130:13 148:8 150:6  
 393:11  
**helps** 140:7 194:7,10  
**hens** 304:2 305:8,17,18  
 306:3  
**herbicide** 221:21 222:4  
 222:15 223:1 328:22  
**herbicide** 223:15 330:6  
 330:12,16 354:10  
 358:4  
**herbicides** 4:9 173:10  
 205:10 221:9 328:4,9  
 328:11,18 334:7  
 335:12 347:10 394:10  
 446:17  
**herbs** 192:3 317:13  
 431:1 434:1 441:13  
 538:6 540:15  
**herd** 248:9  
**Heritage** 3:9 225:7,10  
**hesitancy** 149:12  
**hesitant** 485:13  
**heteros** 90:22  
**hey** 311:5  
**Hi** 28:13 40:7 96:19  
 111:21,22 141:17,18  
 159:1 171:4 196:7  
 200:4 214:7 215:20  
 248:13 269:18  
**hierarchical** 448:15  
**high** 19:13 28:21 30:14  
 30:16 105:4,8 177:22  
 180:10,14,22 181:1,2  
 181:3,11,12,16,19  
 182:17 183:11,16  
 184:12 186:22 187:1  
 218:1 224:3 226:6  
 306:17,18 315:3  
 392:21  
**high-end** 501:11  
**high-lysine** 309:6  
**higher** 63:4,19 71:12  
 169:22 170:4 190:15  
 194:19 216:16 227:2  
 227:21 309:13 449:4  
 457:7

**higher-order** 524:13  
**highest** 87:21 227:20  
 463:16  
**highlight** 495:17,19  
**highlights** 131:13  
**highly** 123:14,20 124:2  
 125:12,18,22 186:2  
 200:9 218:16 508:1  
**highs** 36:15  
**highway** 235:3  
**Hill** 3:8 205:1,9,18  
 207:22  
**Hilliard** 205:2  
**Hiltz** 2:18 129:16  
 133:10,12,15 137:1  
 137:17 138:10  
**hindsight** 26:1  
**his/her** 432:1  
**Hispanic** 514:21  
**historical** 143:17 144:4  
 146:4  
**historically** 145:18  
 390:22  
**history** 40:9 53:21  
 159:10 215:18 240:14  
 240:21 242:10 244:1  
 244:7,14 246:4,17  
 403:3 428:10 470:17  
 488:6 490:8  
**hit** 224:14 304:20  
 388:17 465:18,20  
 468:1 515:17  
**hits** 50:15  
**hitting** 66:6 465:17  
**hives** 155:1  
**hold** 56:20 253:4  
**holders** 118:17 303:9  
 303:15  
**holding** 94:15 184:6  
 279:4  
**holes** 513:8  
**holistic** 63:13  
**home** 100:5 187:14  
 243:10  
**homemade** 372:9  
**honest** 71:3 115:22  
 229:19 494:5  
**honestly** 15:10 91:14  
 311:9 528:16  
**honey** 224:21 249:7,10  
**honor** 93:16  
**honored** 226:7 492:21  
**honors** 116:5  
**hoops** 81:21  
**hope** 83:15 99:1 117:15  
 131:7 152:5 256:19  
 302:9 304:19 336:2  
 442:8 444:17,18

475:16 494:4 519:17  
**hoped** 492:9  
**hopefully** 128:3 273:21  
 465:4  
**hoping** 68:8 305:11  
 308:18  
**horizon** 186:18  
**hormone** 148:14,15,17  
**hormones** 148:19  
**horrible** 475:1  
**horrified** 44:16  
**Hort** 269:19,20  
**Horticultural** 3:9  
**Horticulture** 18:15  
**hostility** 234:12  
**hot** 281:17 393:12  
 531:5  
**Hotel** 1:9  
**hotels** 98:22  
**hour** 76:18 282:7  
 402:17 499:10  
**hours** 176:7,14 185:18  
 196:9 249:11 254:8  
 254:13 313:19 521:16  
**house** 271:6,15 272:1,3  
 537:13  
**housed** 206:14  
**houses** 13:4 341:17  
 466:21  
**Hubbard** 2:19 102:20  
 107:16,18,19 111:16  
 111:22 112:12 114:4  
 115:4,6  
**hubris** 500:14  
**Hudson** 2:19 210:7  
 220:22 221:3,4 224:5  
 224:11,13 225:2  
**huge** 47:4 184:8 297:22  
 318:9 461:7 497:21  
 498:1 511:4 523:12  
**human** 38:20 168:7  
 170:16 250:20 271:17  
 322:16 388:4,9  
 404:10 406:17 407:14  
 499:7 500:14 513:17  
**humane** 56:14  
**humanely** 94:4  
**humans** 37:9 308:12  
 500:18  
**humic** 4:12 351:6,11,18  
 353:5  
**humus** 438:17  
**hundred** 60:14 310:20  
 516:15  
**hundred-acre** 287:12  
**hundreds** 31:19 215:17  
 390:19,19  
**hurdle** 305:6 307:16

**hurricane** 485:9 498:5  
**hurry** 414:17  
**hybrid** 500:2  
**hydrate** 194:8  
**hydration** 194:20  
**hydraulic** 410:17  
**hydro** 82:8,9 155:19  
 200:8,10 201:19  
 202:9 203:1,10,11  
 493:7  
**hydro-organic** 204:3  
**hydrocolloid** 179:16  
 182:9  
**hydrologic** 38:3  
**hydroponically** 32:1  
 74:15 85:1,12,21  
 235:12  
**hydroponics** 8:12  
 15:16 19:18,22 20:3  
 24:3,10 25:13 26:13  
 26:19,21 28:4 31:8,10  
 58:2,5,9,14 61:3,22  
 65:15 68:3 70:9,16  
 77:8 81:7 83:20,22  
 84:2,4,12,14,15,16,18  
 93:17 94:16 95:10  
 98:8 99:15 104:8  
 117:3 120:4 155:12  
 155:16 156:8 158:6  
 201:8 205:5 208:5  
 234:4 235:13,19,21  
 242:19,22 246:3  
 283:10 312:13 313:1  
 313:8,15 427:14  
 428:19 430:13 449:22  
 450:7,16,19 457:21  
 460:9 462:5 473:11  
 473:22 476:4 477:20  
 482:10 483:6,17  
 484:9 486:12 488:6  
 490:11 491:6,19  
 492:3,13 516:9  
 517:21 524:6 527:13  
 535:3,7 539:10,17  
**hydroxide** 347:5  
**hydroxyl** 375:9  
**hygiene** 207:8  
**hypochlorite** 4:8,9  
 270:11,12 271:14,21  
 321:1,2 322:2,3  
 324:11,13,14 325:9  
 327:5  
**hypochlorous** 248:18  
 249:1,4,8,14 250:1,4  
 250:8 251:10 252:8

---

I

---

**i.e** 99:3

- ice** 136:1  
**iceberg** 502:5  
**ick** 507:22  
**ICL** 3:2 167:19  
**Idaho** 270:1  
**idea** 23:10 32:4 34:19  
 39:1,14 97:21 235:13  
 245:5 253:4 267:6  
 319:14 518:21 519:3  
 522:15 524:3,6  
 525:14  
**ideal** 10:8  
**ideas** 25:20 26:17,20  
 46:19 116:16 117:16  
 118:16 131:21 139:4  
 148:8 220:13 525:11  
 525:19  
**identical** 18:3 358:16  
**identified** 42:10 44:21  
 109:11 123:1 132:2  
 183:7 486:14  
**identify** 51:4 52:6 97:7  
 105:11 113:18 128:9  
 131:18 134:3 147:14  
**identifying** 112:16  
 134:7  
**identities** 128:17,18  
**identity** 38:15 127:20  
 128:8,10,13 129:2  
**IDFA** 193:7,13  
**IDFA's** 195:7  
**IFAC** 3:10 159:4,8  
**IFOAM** 20:10 199:6,7  
**IFOAM-1** 199:9  
**ignore** 421:21 440:2  
**ignores** 490:8  
**ignoring** 156:11  
**ii** 322:2 335:13 358:7  
**iii** 322:3 335:13  
**Illinois** 469:20  
**illustrated** 104:5  
**illustrates** 222:8,14  
**images** 143:20 146:5  
**imagine** 47:21 140:11  
 146:10 437:17  
**imagined** 499:16  
**immediate** 23:15  
**immediately** 106:10  
 316:3  
**impact** 224:21 297:22  
 329:8 339:4 361:17  
 408:9 477:8 481:12  
 511:17  
**impacted** 117:14  
**impacts** 105:13 107:9  
 119:12 139:3 160:4  
 161:20 352:5 388:4  
 404:9  
**impede** 483:5  
**imperative** 106:9  
**impetus** 444:10  
**implement** 30:5 217:15  
 445:8 471:13  
**implementation** 150:9  
 150:12 228:9 292:20  
**implemented** 150:8  
 226:18 228:16 229:2  
 271:11  
**implementers** 284:11  
**implications** 388:10  
**implore** 52:19 53:10  
**import** 216:6 407:10  
 506:4  
**importance** 265:20  
 272:19 487:1  
**important** 8:11,15 25:5  
 35:7,19 52:19 57:16  
 63:7 64:13,15 72:19  
 84:13 87:22 89:19  
 99:2 105:22 110:3,13  
 112:19 118:12,22  
 123:14 130:9 139:8  
 141:5 144:14 147:5  
 147:12 160:6 181:19  
 213:8 235:10 251:15  
 252:6 255:20 269:14  
 274:12 293:15 294:3  
 294:6,7,9 295:17  
 297:20,20 312:15  
 333:8 380:7 388:7  
 402:4 424:1 443:20  
 444:9,11,12 460:19  
 461:5 485:11 490:19  
 498:17 508:15 523:5  
 528:11  
**importantly** 41:11 83:6  
 444:7 446:22  
**imported** 43:6 119:1  
 214:20 318:13  
**importers** 220:1  
**imports** 43:4 79:7 91:12  
 122:2,6 215:21 216:4  
 216:14,17 217:2  
**impossible** 156:2 313:1  
 313:7  
**impressed** 284:5  
**impression** 258:5  
 425:12  
**impressions** 252:16  
**impressive** 479:1  
**improve** 55:15 122:1  
 433:1,3 452:4 453:3  
 467:16 479:12 532:18  
 532:19  
**improved** 104:10  
**improvement** 43:8  
 89:13,13 103:5  
 112:21 114:7,17  
 131:20 255:9 268:17  
 268:20 269:1 421:12  
 458:5,16 479:8 484:8  
**improvements** 113:3  
 115:17,20 421:1  
 422:10  
**improving** 51:3 103:12  
 156:15 187:6  
**impugn** 6:14  
**in- 77:15,17**  
**in-depth** 379:7  
**in-field** 348:10  
**in-ground** 77:7 78:15  
 78:16 82:3 86:17 90:5  
 91:1,2 202:7,17  
 488:17,19 489:1  
**in-person** 98:8 294:17  
 295:2  
**in-soil** 62:17 317:18  
 444:6 489:21  
**inaccurate** 202:11  
**inadequate** 314:17  
**inappropriate** 123:16  
 201:12  
**incentive** 4:4 198:17  
 203:3  
**incentives** 42:1 57:14  
 143:5 144:12  
**inception** 67:20  
**incidences** 333:8  
**incident** 475:1  
**inclined** 449:9 476:6  
**include** 13:21 60:16  
 85:10,11 109:13,16  
 150:19 154:17 155:19  
 157:12 168:16 177:16  
 183:20 209:8 248:17  
 256:9 268:17 331:7  
 345:8 432:22 449:2  
 451:8 452:15 453:5  
 473:10 492:14 532:17  
**included** 97:11 158:12  
 160:16 184:21 225:17  
 245:18 248:18 336:6  
 348:7 405:7 444:1  
 481:11  
**includes** 8:9 158:6  
 168:13 182:10 197:8  
 212:12 270:10 338:6  
 347:6 363:15 501:15  
 515:11  
**including** 13:12 106:8  
 111:5 159:6 193:9  
 272:20 283:6 321:13  
 340:21 343:7 344:15  
 348:10 406:6 420:18  
 420:20 421:1 422:2  
 431:18 448:20 449:2  
 452:5 456:20 478:2  
 501:11 507:5  
**inclusion** 304:17  
 305:11,20 311:3  
 443:21 509:6  
**inclusive** 505:2 515:9  
**inclusiveness** 442:11  
**incoming** 173:8  
**incompatible** 313:3  
 366:8  
**incomplete** 26:20,22  
**inconsistencies** 192:13  
**inconsistency** 378:19  
**inconsistent** 233:5  
 382:14 490:6  
**incorporated** 3:13  
 79:19 99:14 274:9  
 371:14  
**incorporating** 51:6  
 406:7 480:1  
**incorporation** 275:7  
**incorrectly** 160:12  
**increase** 101:7 132:2  
 161:7 250:9 269:10  
 445:18 500:3,9,9  
**increased** 110:3 265:21  
 421:13 422:6  
**increases** 169:22  
**increasing** 269:12  
 283:6 394:10 497:2  
**incredibly** 127:4 482:20  
**independent** 49:22  
 122:20 148:22 161:16  
 177:9 303:8  
**indicate** 48:13 183:5  
**indicated** 117:2 132:13  
**indicates** 375:13  
**indicating** 438:1  
**indication** 101:12  
 172:11 434:10  
**indications** 484:13  
**indicators** 144:6  
**indigenous** 513:10,14  
 514:12  
**indirectly** 395:11  
**individual** 6:15 110:21  
 127:22 303:9 354:22  
**individually** 322:11  
 380:13,16 389:21  
 410:20 412:12  
**individuals** 83:13 208:3  
 232:1  
**indoor** 151:13 173:2  
 455:1,1  
**indoors** 238:22  
**industrial** 39:2 177:20

285:4  
**industrialize** 95:13  
**industry** 68:22 75:17  
 94:21 96:2 99:22  
 110:19 111:2 114:14  
 114:15 126:20 134:15  
 135:2,6 138:1 139:2  
 148:9 178:1 186:2,8  
 187:10,22 189:4  
 193:8 197:20 216:10  
 230:8,13 240:16  
 245:11 246:8,9,10  
 258:20 259:21 262:14  
 271:5 303:14 306:9  
 348:16 388:3 483:7  
 505:21  
**inerrant** 87:4  
**inert** 42:8 44:12,14,15  
 45:6 65:21 66:2,5  
 450:3  
**inerts** 44:20,22 45:15  
 45:18,22 47:1 53:20  
 53:21 124:5,9 509:5  
**infection** 250:6  
**inferior** 161:2  
**infertility** 451:17  
**infield** 135:8  
**influence** 38:13  
**info** 165:6  
**inform** 140:7 148:8  
 179:2  
**information** 26:4,10  
 44:7,20 45:20 48:15  
 48:16,21 49:3,4 89:7  
 97:22 120:13,17  
 143:22 165:11 181:22  
 218:9 220:20 232:16  
 238:13 239:6,22  
 252:15 257:5 261:12  
 266:22 267:15 279:12  
 293:10 302:2 303:3  
 363:10 376:22 379:9  
 396:2,11 435:7  
 436:14 473:1 482:1  
**informed** 495:7  
**informs** 151:20 262:18  
**infractions** 316:18  
**infrastructure** 139:2  
 188:12 485:6,7 486:6  
**infringed** 316:19  
**ingested** 249:16  
**Ingestion** 322:19  
**ingredient** 45:17 100:3  
 101:17 160:16 166:8  
 166:19 167:3,20  
 179:19 180:6,10  
 229:15,16 406:12  
**ingredients** 42:8 44:14

45:7 70:20 101:19  
 124:11 126:16 159:6  
 170:1 177:22 182:11  
 195:9 260:18  
**inherent** 187:4  
**inherently** 511:15  
**initial** 57:8 94:13  
 219:11 472:22  
**initially** 107:12 512:8  
**initiated** 101:11  
**initiates** 430:4  
**initiatives** 213:1  
**injuries** 322:21  
**injury** 322:19  
**inner** 498:3  
**Innovacyn** 3:6  
**innovated** 203:4  
**innovation** 421:20  
 445:17 457:10 477:14  
 483:5  
**innovative** 203:10  
 205:4 296:17 453:21  
 500:10 505:3  
**inoculation** 452:12  
**inorganic** 19:7  
**input** 50:21 105:20  
 110:14 152:8 241:14  
 278:22 331:12,14  
 446:16 490:7 495:19  
**input-based** 481:5  
**inputs** 15:8 21:4 27:14  
 38:2 42:20,22 50:19  
 52:17 74:7 82:13  
 86:22 87:7,7 202:10  
 245:22 362:4 420:9  
 446:18 456:22 458:7  
 470:10 487:21,22  
 488:18,20 489:4  
 498:10 520:18,21  
**inquired** 331:13  
**inquiries** 165:10 215:14  
 248:19  
**insect** 310:7 465:11  
 486:1  
**insecticidal** 222:1,2  
 224:2  
**insecticide** 230:12  
 343:7  
**insecticides** 230:18  
 340:21 344:14  
**insects** 37:10 173:9  
 305:14 307:18 310:3  
**inside** 197:10 332:3,7,7  
**Insider** 2:17 312:11  
**insight** 233:1  
**inspect** 312:17 313:2  
**inspected** 312:21  
 470:19

**inspecting** 313:6  
**inspection** 55:12 57:8  
 207:18 217:7 267:13  
 331:5 424:17 470:21  
**inspections** 12:2 149:1  
 331:7 333:4 425:1,2  
 516:6  
**inspector** 148:22 211:1  
 218:11 464:1 470:19  
 516:4  
**inspectors** 131:12  
 268:1 434:18 480:9  
**inspired** 284:5  
**installed** 199:10  
**instance** 175:10  
**instances** 115:9  
**Institute** 243:4  
**instructing** 113:12  
**instrumental** 226:21  
**insufficient** 106:5  
**insulting** 314:17  
**insure** 213:17  
**insured** 213:15  
**insurer** 213:16,16  
**intake** 435:20 436:4  
**Integrate** 467:12  
**integrated** 465:2  
**Integrative** 250:19  
**integrity** 43:8 54:11  
 94:13 95:3 103:4  
 108:7,10 122:8  
 154:19 210:21 226:1  
 228:22 261:19,22  
 262:9 266:20 314:18  
 315:5 422:22 463:1  
 502:17  
**intellectual** 279:18  
**intended** 16:17 27:20  
 233:16,21  
**intends** 337:3  
**intense** 36:17  
**intensive** 223:10 274:2  
**intent** 28:8 103:7  
 115:11 124:1 125:18  
 125:18 472:9 473:20  
 476:3 483:13 484:14  
 484:15 508:9  
**intention** 472:3,6  
**intentions** 502:18  
**interact** 65:4 512:3  
**interacted** 71:19  
**interaction** 64:20  
 274:11 512:18  
**interactions** 118:12  
**interest** 79:14 80:6  
 110:20 177:16 270:9  
 336:12 371:8 420:20  
 470:16 514:1

**interested** 118:3 243:16  
 268:12 297:2 482:16  
**interesting** 204:7  
 307:19 525:11,19  
**interfere** 159:19  
**intergenesis** 256:6  
**interim** 48:22  
**international** 2:8 3:5  
 122:9 159:4 167:4  
 168:2 170:17 177:5  
 193:6 213:13,19  
 270:2  
**internationally** 116:15  
**internet** 435:5  
**interpret** 472:8  
**interpretation** 30:3,20  
 471:17 484:21  
**interpretations** 192:10  
**interpreted** 484:19  
**interpreting** 232:15  
**interrelationships**  
 10:11  
**interrupt** 6:16 175:13  
**intertwined** 439:10  
**interval** 403:11 410:1  
 414:9  
**intervals** 406:14,22  
 411:12  
**interviewed** 131:17  
**intimately** 439:10  
 440:16  
**intimidated** 318:5  
**intragensis** 123:4  
**intrigued** 489:10  
**intriguing** 235:20  
 502:16 522:12  
**introduce** 328:7 360:18  
 374:7  
**introduced** 182:12  
 219:18 235:12 242:20  
 310:22 341:8 448:2  
 448:14 449:16,17  
 450:9  
**introducing** 399:20  
**introduction** 448:6  
 453:11  
**inulin** 258:9 260:22  
 261:18 263:11,12,14  
 263:16 264:3  
**invest** 273:11  
**investigation** 314:8,12  
 314:15  
**investing** 130:14  
**investment** 82:17  
**investors** 148:8  
**invited** 430:2  
**involved** 47:22 54:3  
 78:22 79:21 157:15

287:9 393:20 456:6  
504:21 512:1 523:5  
**involvement** 40:10  
79:22  
**involves** 45:22 46:3,9  
222:16  
**ions** 194:5  
**Iowa** 439:14,20 495:5  
**IPPA** 177:4,8,10,12  
178:6  
**Ireland** 138:4  
**iron** 4:14 357:20 358:9  
359:9  
**irradiated** 94:11  
**irradiation** 157:4  
**irrelevant** 395:12  
**irresponsible** 202:12  
**irrigation** 191:9 272:1  
321:14,17 323:4  
**irritant** 152:15 342:2  
**irritation** 322:20  
**Irwindale** 308:7  
**Isaura** 2:8 18:7 35:21  
35:22 36:2  
**Island** 410:14  
**isolate** 275:17  
**isolation** 413:7  
**issue** 8:18 16:7 24:1  
44:9,12 50:5 52:20  
54:4 58:2 59:20 68:3  
68:6,7 81:12 99:3  
108:9,22 120:4 124:7  
125:21 128:7 142:3  
152:19 188:12 200:12  
204:8 210:18 221:15  
229:7 231:12 244:2  
257:11 267:3 278:14  
305:16 338:17 342:2  
344:21 381:19 387:13  
388:8,16 390:12  
399:9 413:21 422:16  
423:2 430:5 456:4  
459:17,21 481:20  
482:9 488:7 492:20  
495:22 496:6 498:1  
509:3 515:2 523:8  
525:5  
**issued** 201:4  
**issues** 35:7,14 40:13  
41:19 42:6 56:2,7  
81:7 113:14 116:4  
117:5 128:5 139:7,10  
140:8 141:21 148:3  
150:17 152:13 204:2  
232:3,12,16 238:14  
269:8 270:2,5 329:3,5  
333:22 412:15 480:13  
508:15 510:4 511:10

524:12  
**Italy** 219:4  
**item** 44:1 328:3 335:7  
340:17 344:11 354:4  
370:19,20 373:19  
379:8,12,13 403:18  
419:3 526:18 541:19  
**items** 41:17 100:9  
126:18 138:22 142:17  
168:19 208:20 308:3  
348:20 368:13 418:21  
**iterations** 432:9

---

**J**


---

**j** 351:9 354:8 358:2  
360:21  
**Jacksonville** 1:9,9  
**jam** 180:7,17 186:15  
188:6  
**jam-packed** 7:2  
**James** 315:22  
**jams** 162:7 181:7  
184:18  
**January** 155:15  
**Japan** 277:19  
**Jay** 49:18 53:14,16  
56:18  
**Jeff** 2:13 9:2 121:13,14  
126:6,6,8  
**Jefferson** 471:15,17  
**Jeffrey** 126:5  
**jellies** 162:7 181:8  
**jelly** 180:18  
**JENNIFER** 2:5  
**Jenny** 2:14 253:21  
261:5 265:10,11,13  
**Jerry** 21:9  
**jersey** 436:4  
**Jesse** 1:12 244:5 247:4  
294:13 296:6 299:14  
334:9 346:2 356:16  
374:4,7 375:5 381:17  
390:8,10 396:21  
398:4 418:1 492:18  
494:21 533:4 536:3  
540:17  
**Jessica** 3:3,12 176:22  
179:10,11,14 182:12  
183:10 193:3 196:3,5  
196:6  
**Joanna's** 57:11  
**job** 18:18 54:14 59:7  
284:2 294:10 393:12  
394:4 456:1  
**Joelle** 1:16 16:1 64:16  
111:9 119:19 162:22  
165:14 172:9 234:16  
236:8 334:10 372:20

397:2 407:4 410:21  
412:12 413:5 427:18  
504:10 506:8  
**John** 2:9,12,13 5:5 18:6  
18:8,10 21:8 28:13  
204:19 210:6,8 213:3  
213:4 214:7 215:20  
216:1 220:9,17 282:3  
312:7 315:13,14,16  
315:18 320:9,12  
**John's** 251:3  
**Johnson** 2:20 126:6  
129:15,15,22 130:1  
133:6,8  
**join** 97:8  
**journey** 37:8  
**judge** 472:3  
**judgment** 408:8  
**judiciary** 471:21  
**juice** 177:20 179:6  
**juices** 180:3 181:13  
**juicing** 185:19  
**Julia** 2:11 133:10  
138:11,14 141:17  
**Julie** 3:13 93:10 99:6,7  
99:12 102:18  
**July** 429:8  
**jump** 81:21 258:18  
519:1  
**June** 374:13  
**Jurlina** 2:20 179:10  
181:21 182:6,7 185:8  
185:11 186:19 187:18  
187:22 188:4,10,14  
188:16 189:7  
**justification** 192:7  
363:2 492:6  
**justifications** 189:22  
**justify** 38:12 105:3  
376:22 489:4  
**justifying** 104:2 109:18  
412:3

---

**K**


---

**Kahn** 243:11  
**kale** 192:4  
**Kanalani** 2:10 154:7  
**Kandt** 2:21 225:4 231:8  
231:10,11 234:20,22  
236:11,15,18,20  
237:1,3,6,8,14,17,19  
238:15,21 239:13,18  
239:20 240:4 246:14  
**Karlin** 2:21,21 40:4  
49:17,20,21,22 53:13  
**Karreman** 251:20  
**Kathleen** 243:14  
**Kay** 2:16 243:11  
**keep** 7:9 19:15 49:12  
53:10 68:1 77:4 95:7  
97:8 115:17 124:17  
126:13,17,17 176:18  
184:4 257:12 288:15  
298:16 299:9 316:17  
319:21 330:19,20  
332:18 337:18 338:6  
348:22 369:6,8  
371:18 477:13  
**keeper** 54:6  
**keeping** 257:12 323:6  
363:2 451:9  
**keeps** 153:6  
**Keith** 2:21 225:4 231:8  
231:11 237:10  
**Kelco** 2:20 3:3 179:15  
182:8  
**Kelly** 2:15 67:12 80:20  
80:22 81:3 83:18  
87:14 93:9  
**kelp** 175:10,16,17  
245:21  
**Kentucky** 210:16  
**kept** 263:8  
**Kerrigan** 3:2 80:21  
93:10,13,14 96:14,17  
96:22 97:4,8,12 98:5  
99:5  
**Kershman** 244:17  
**key** 54:4 75:2 180:2  
266:2 482:14 491:7  
**kick** 444:19  
**kicked** 309:19  
**kids** 498:3,5  
**Kiki** 2:19 102:19 107:16  
107:19 111:21 114:2  
116:9 269:7  
**kill** 249:9 250:14 307:11  
402:20  
**killed** 319:15  
**kills** 249:16  
**kinds** 338:18 438:11  
471:18 500:8 516:15  
**Kinsman** 243:5  
**kit** 102:15  
**Kittle** 56:19,19,20 67:10  
67:10,11  
**Klope** 158:22  
**Klopf** 3:2 167:18,19  
171:10 172:1,13  
**knew** 44:14 154:12  
295:6  
**Knott's** 435:6  
**knowing** 56:1 95:18  
257:7 451:4  
**knowledge** 146:4 178:8  
340:15 388:13,18

390:18  
**known** 134:18 152:15  
 224:3,8 255:18  
 256:12 328:20 411:7  
**knows** 56:21 238:4  
 487:12  
**Knutzon** 3:3 176:22  
 179:10,13,15  
**konjac** 162:14,19 165:2  
 165:5 257:4,16 261:9  
 261:13  
**Kraft** 338:6  
**krem** 276:14  
**krems** 277:12  
**Kuenkel** 3:3 269:17  
 273:6,7 276:11 277:3  
 277:8,11,16 278:3  
 279:13,16 281:3,7,11  
 281:14

---

**L**

---

**lab** 243:12 273:14  
**label** 15:13 54:6,8 55:10  
 56:10 69:4 70:4,6  
 71:15 74:8 83:9,10  
 84:22 85:7,20 90:1  
 120:7 197:7,10,10  
 200:21,22 201:2,4  
 203:8,13 204:2,11,14  
 209:5,10,16 224:16  
 224:18 234:19 237:21  
 288:6 289:17,17  
 301:11 321:21 331:8  
 392:7 457:12 458:1,2  
 461:11 462:18,22  
 463:2 469:11 470:9  
 481:13 492:12,14  
 505:1,11 506:16  
 508:7 510:3 512:2,9  
 512:10,12,14 515:13  
 515:14 519:18 520:14  
 520:17,19,22 524:22  
 528:15  
**labeled** 32:22 34:11  
 55:3 72:9 83:22 95:19  
 155:22 166:13,16  
 186:16 237:12 264:3  
 275:1,2,10,12 407:11  
 472:14 476:5 495:10  
**labeling** 15:1 25:21  
 69:3 71:8 72:7 75:19  
 75:22 83:7,22 84:4  
 89:21 120:5,21 204:1  
 209:2 288:4 289:15  
 429:12,17 476:6  
 481:11 507:15,20  
 511:21 513:1 518:22  
 519:1 520:9 523:1

524:4  
**labels** 56:10 85:2  
 128:16  
**labor** 76:22 223:10  
 387:8,13 388:8,9,21  
 390:22 393:18,20  
 461:19  
**labor-intensive** 394:3  
**Laboratory** 405:7  
**lack** 105:2 117:5 249:6  
 257:1 315:2 343:1  
 366:10 376:19 425:3  
 425:3 483:4 496:6  
**lacking** 488:4  
**laden** 242:17  
**ladies** 254:1  
**land** 11:4 37:13 42:2  
 56:14 57:20 94:5  
 128:2 143:12 145:3,5  
 174:3 199:10 286:12  
 290:5 308:16 447:1  
 474:13,21 475:11  
 509:17  
**land's** 143:15,17  
**landfill** 337:14  
**landings** 136:11  
**lands** 513:11,13  
**landscape** 90:17 97:21  
 233:11  
**language** 85:19 100:16  
 104:8 131:2 133:4  
 134:1 197:1 245:13  
 256:11 268:5 446:7  
 483:12 484:16  
**languishing** 245:7  
**large** 31:15 52:4 68:16  
 75:8 87:15 97:19 98:2  
 98:13,14 132:3,5  
 240:12 285:4 303:14  
 409:7 431:18 460:7  
 485:20 491:20 509:14  
 523:7  
**large-** 485:20  
**large-scale** 308:8,10  
**largely** 449:22  
**larger** 10:21 15:3 96:1,1  
 174:9 269:14 303:6  
 437:11 462:22  
**largest** 42:8 124:9  
 133:17 210:12  
**LaRocca** 3:4,4 56:21  
 67:11,13,14,15 70:18  
 71:22 72:13 73:8,12  
 74:21 75:18 76:8,12  
 76:16 77:13,17,21  
 78:3,9,11,21 79:19  
 80:19  
**larvae** 304:2,3,4,8,10

304:16 305:4,21  
 306:3 308:13 310:21  
**lastly** 109:21 228:8  
 457:13  
**late** 22:10 36:15 221:15  
 355:9 356:3 376:12  
 478:16  
**Latin** 134:3 188:19  
 471:22  
**Laughter** 423:13 427:7  
 487:10 490:16 494:7  
 518:5 522:5,8 534:20  
**Lauren** 2:20 126:6  
 129:15,15,19 130:1  
**law** 41:14 54:2,17,19  
 55:8,20 80:7 122:16  
 213:19 233:1 316:6  
 457:18 471:13,13,20  
 472:2,5,10 484:21  
 485:2 514:16 515:3  
 524:22  
**lawgiver** 472:3  
**laws** 213:14 471:18  
 472:8 484:17  
**lawyer** 483:11  
**lawyers** 80:8 483:9  
**lay** 219:18 469:5  
**layers** 501:11  
**laying** 304:2 305:8,17  
 306:3  
**leach** 437:20  
**leaches** 440:2  
**leaching** 437:1  
**lead** 4:15 94:9 272:11  
 322:8 328:4 341:5  
 358:13 361:4 368:16  
 369:1,3,4,19 371:5  
 374:4 390:9 420:15  
**leader** 270:18  
**leaders** 490:2  
**leadership** 44:1  
**leading** 196:10  
**learn** 14:17 19:6 337:19  
 472:1 513:18  
**learned** 24:12 27:19  
 220:11 477:22  
**learning** 95:17 127:13  
 481:21 487:2  
**learnings** 232:13  
**leased** 286:12 509:17  
**leave** 35:6 84:22 91:9  
 157:8 202:19 250:11  
 289:11 365:18 369:5  
 462:18 481:15 506:6  
**leaves** 20:22 148:18  
 201:19 206:17 239:2  
 258:10 260:22 261:20  
 262:22

**leaving** 47:15  
**led** 28:1 35:13 176:11  
 442:12  
**Lee** 2:16 182:3 189:9,10  
 189:13 192:19  
**left** 153:12 275:3 282:1  
 299:22 427:8 446:1  
**leftovers** 88:22  
**legacy** 233:18  
**legal** 55:8 200:18 316:8  
 316:18 323:13 515:1  
 515:6 524:21  
**legally** 201:5 264:3  
 317:2  
**legislation** 232:21  
**legitimate** 409:15  
 462:19  
**legitimately** 462:11  
**legumes** 501:15  
**lemon** 177:17  
**lemon's** 185:14  
**lemons** 179:3,4  
**length** 145:19  
**lengthy** 377:2  
**lenience** 74:4  
**Leopold** 145:2  
**lessen** 421:19  
**lesson** 515:10  
**let's** 39:14 69:3 157:15  
 203:10 245:16 246:8  
 246:8 399:15 434:20  
 468:18 504:11 527:6  
 527:7 533:13  
**letter** 156:13 211:1,6  
 408:15,15 413:12,13  
 517:9  
**letters** 15:19 411:14  
**letting** 504:2  
**lettuce** 88:20 173:3  
 174:10 191:19 491:9  
 498:6,8  
**level** 59:2 63:19 76:3  
 79:2,9 125:9 127:17  
 128:8,14 129:3  
 164:16 169:15 170:5  
 172:11 180:19 181:3  
 207:13,16,17 268:2  
 287:5 422:19 442:17  
 448:8,15,16,19,22  
 449:1,4,4,6,7 454:21  
 516:9  
**levels** 24:17 164:8  
 166:4 167:15 172:16  
 176:3 183:14 190:10  
 190:15 321:15 448:6  
 448:13 449:12 450:13  
 453:12 454:15 455:4  
 455:11 499:14 501:19

516:7,18  
**leverage** 132:1  
**Lewis** 2:3 3:4 43:20  
 53:15 56:18 57:2,3  
 60:16 61:7,12 62:4,20  
 64:11 65:2,16,19 66:3  
 66:8,11 67:8  
**licensed** 136:8 248:15  
**lichen** 448:21  
**licked** 249:16  
**lies** 16:6  
**lieu** 451:21  
**life** 9:15 19:2 20:12 37:6  
 37:12 100:1 278:21  
 309:1 336:7 453:17  
 466:8 468:9 501:3  
 513:15  
**lifetime** 284:16  
**light** 10:18 24:21 29:13  
 29:15 134:16 176:6  
 176:16 478:15 527:19  
**lighting** 5:16 29:7 35:14  
 176:10,11 488:22  
**lignin** 260:13  
**liked** 309:10  
**likes** 520:5  
**LIMA** 1:15 171:4,18  
 172:8 325:13 326:11  
 327:22 335:2 340:5  
 344:5 346:12 350:19  
 353:16 357:4 360:2  
 366:19 367:21 370:4  
 373:2 381:11,22  
 386:9 397:15 398:20  
 416:21 418:11 426:19  
 510:9 531:22 536:14  
 538:20 541:4  
**lime** 177:17 179:1,3  
**limes** 179:4  
**limit** 59:11 67:22 86:7  
 86:14 87:3 125:18  
 255:17 301:5 321:19  
 392:6 430:20 433:16  
 433:18,22 441:4,6,12  
 476:6 483:14 514:15  
 537:21 538:1,5  
 539:19,21 540:6,8,14  
**limitation** 86:17 87:6  
 185:10 431:3  
**limitations** 25:3 32:10  
 86:12 431:7  
**limited** 2:18 102:14  
 168:6 286:15 310:17  
 345:4 452:6,15,16  
 537:16  
**limiting** 7:10 39:11  
 195:15 396:1  
**limits** 124:20,22 125:11

515:4,4  
**line** 20:9 33:4 84:17  
 94:12,15 169:14  
 190:2 201:6 310:4  
 365:16 383:20 480:8  
 503:11  
**lines** 32:20 87:1 166:11  
 237:15 467:3 524:5  
**linkage** 238:19  
**lips** 235:16  
**liquid** 11:1 59:11 60:11  
 60:14,17 61:5,14 62:2  
 87:6,7 88:16 89:6  
 103:9,18 124:20,22  
 184:6 342:21 402:2  
 404:2 431:6 433:17  
 434:6 435:2 441:6  
 470:11 537:22 539:21  
 540:8  
**liquids** 86:9  
**Lisa** 1:15 2:2 154:20  
 171:3 320:22 321:3  
 322:7 326:9 335:9  
 340:18 344:12 347:1  
 354:6 357:22 360:16  
 368:17 370:21 373:1  
 375:4 381:9 510:8  
 513:4  
**list** 2:2 40:19 42:18  
 45:10,12 101:2  
 116:22 126:13,18  
 148:13 160:16 166:21  
 167:2,3,22 168:6,13  
 177:13 178:16 182:21  
 191:7 208:20 226:15  
 227:13,18 228:7  
 241:21 242:14 247:10  
 254:18 259:9,13  
 260:14,17,20 261:1  
 261:14 270:10 282:1  
 292:5,6 295:7 301:12  
 307:8,17 308:1 310:6  
 321:9 323:7 324:4  
 329:1,11 331:12,14  
 368:20 369:6,8  
 372:11,22 374:17  
 386:20 387:6 392:19  
 397:22 398:7 410:15  
**listed** 166:21 263:11,18  
 362:12,21 371:10  
 372:5 379:12 416:8  
 542:4  
**listen** 379:5  
**listened** 476:19  
**listening** 248:14  
**limiting** 7:10 39:11  
**listeria** 271:18 411:5  
**listing** 100:13,17  
 101:16 106:17 109:10

123:3 167:21 227:17  
 228:7 272:18 301:10  
 328:10 338:5 341:12  
 344:16 347:3,11  
 351:10 354:9,13  
 360:22 368:22 371:1  
 379:13 395:12 397:20  
**listings** 107:7  
**literally** 31:18 307:10  
 313:16 464:13 469:3  
**literature** 105:19  
 159:21 161:12,17  
 361:11 496:9  
**little** 13:3 14:8,22 15:20  
 16:19 20:8 21:6,22  
 25:21 44:12 53:22  
 71:12 73:19 77:11  
 91:7 128:4 134:20  
 155:8,9 239:6 242:10  
 244:1,7 245:6 253:12  
 262:7 269:7 279:3,11  
 283:20 289:21 310:4  
 332:3 381:13 384:16  
 388:11 391:20 395:3  
 403:1 419:14 424:5,8  
 425:6,14 427:8 428:9  
 433:8,11 439:5 448:4  
 475:21 519:19  
**live** 440:7,9 459:5 493:4  
 493:4 498:5  
**lived** 234:5  
**lives** 39:13 259:5 491:8  
**livestock** 57:6 147:16  
 149:10 150:6 151:4,7  
 152:14 154:21 226:15  
 226:16,19 227:11  
 322:14 371:22 372:5  
**living** 2:17 37:2 39:12  
 79:4 151:19 191:10  
 312:11 438:9 461:21  
**LLC** 3:13 99:14 374:16  
**LMA** 186:20,21 187:9  
 187:10  
**LMC** 186:20 187:7,8  
**load** 213:17 217:12  
**loaded** 219:8  
**loads** 211:18,18 509:9  
**loam** 290:21  
**lobby** 264:11 265:1  
**local** 3:8 20:21 173:1  
 458:20  
**locate** 218:3  
**located** 225:8  
**locations** 185:21 189:4  
 308:9  
**log** 249:9,11  
**logic** 279:19 317:14  
 488:4

**long** 17:19,19 34:17  
 40:9 70:2,19 90:13  
 137:20 145:21 159:10  
 215:15 216:18 222:16  
 245:15 252:13 283:17  
 389:4 399:6 440:19  
 454:17 470:17 471:12  
 477:4 488:5 499:8  
 517:14 527:5  
**long-** 22:9 458:20  
**long-term** 336:7,9  
 338:22  
**longer** 22:19 23:13  
 90:14 150:11 290:16  
 362:18 474:16 504:5  
 513:14  
**look** 13:22 14:5 17:6  
 23:7,8 45:16,18 50:14  
 51:1,12 63:12 64:10  
 121:4 125:14 128:6  
 128:11 140:4 145:15  
 148:6 186:19 203:15  
 203:16 211:2,3  
 249:10 251:12 252:1  
 256:1 259:20 262:16  
 264:19 267:15 269:1  
 269:15 283:21 295:11  
 298:7 302:3 307:3,4,7  
 310:3,5 371:19  
 377:16 383:8 403:20  
 409:11 412:11 414:17  
 424:6 433:7 437:4,10  
 438:2,3,7 439:4 440:4  
 496:9 510:19 518:8  
 518:12 525:18  
**looked** 51:10 162:3  
 165:9 172:2 219:21  
 267:2 306:16 404:8  
 500:7 516:22  
**looking** 15:13 17:15  
 42:14 44:2,22 46:1,3  
 47:2 60:22 62:22  
 89:10 91:21 92:5  
 98:14 125:14,21  
 126:1 128:6 165:7  
 184:10 186:1 214:15  
 219:5 227:3 230:17  
 267:19 282:8 283:20  
 306:11 348:9 413:22  
 414:10,19 420:9  
 464:15 469:6 478:13  
 480:7 481:4 492:4,11  
 517:5 520:13  
**looks** 131:20 152:7  
 268:20 385:5 506:19  
 521:18  
**loophole** 85:9 132:21  
**loose** 419:14

**looser** 14:8  
**Lori** 3:2 158:22,22  
 167:17,19  
**lose** 117:9 297:21 437:1  
**lose-lose** 524:11  
**losers** 191:14  
**loss** 144:14  
**lost** 100:12 214:11  
 242:20 415:6,7  
 475:15  
**lot** 12:16 14:17 16:11  
 16:11 17:5 21:3 31:6  
 31:7 33:2 50:12 53:20  
 59:21 62:16,18 65:8  
 68:16 69:6 72:1,9  
 73:15 75:21 78:14  
 80:12 87:14 88:2  
 90:22 91:1,22 98:10  
 175:11 184:7 188:18  
 197:8 201:10 217:1  
 220:11 229:19 230:11  
 231:16,17 232:6  
 237:20 239:2,2  
 240:14,15 241:5  
 250:1,13 251:6  
 257:18 273:11 275:21  
 278:20 291:16 293:18  
 295:14 296:16 298:5  
 314:21 323:1 332:21  
 332:21 333:3,5,16  
 358:18 369:13 377:17  
 378:2 389:22 390:21  
 407:7 425:1,2 432:7  
 436:17 459:19 469:15  
 475:20 482:22 486:9  
 500:7 503:2 504:19  
 506:12,21,22 507:21  
 510:11 511:5,9,11  
 512:18 525:7,18  
 527:21  
**lots** 108:17  
**loud** 522:19  
**loudest** 318:6  
**Louis** 167:20  
**Louisiana** 210:15  
**love** 145:6 384:15  
 387:14 393:15 407:5  
 461:20  
**loved** 185:12  
**low** 21:22 110:14 136:3  
 172:16 180:10,11,13  
 180:19 181:3,14,22  
 182:16 183:11,16,19  
 187:1,15 226:6 329:8  
 452:11 456:21  
**low-end** 501:12  
**lower** 141:13 164:15  
 169:15 309:13

**luck** 252:22 308:18  
**lucky** 459:14  
**lunch** 49:13,16 76:20  
 153:6 281:20,22  
 282:4,6  
**luxury** 505:20  
**Lynn** 2:14 107:17  
 116:10,12 119:18  
 121:2  
**Lyons** 3:5 189:10 193:3  
 193:4,5  
**lysine** 307:1,6 309:22

### M

**M-E-U-M** 471:22  
**macaroni** 163:10 164:5  
 166:22 168:17 171:8  
 172:4,7  
**madder** 424:16  
**Madison** 315:22  
**magazines** 509:1  
**magic** 92:10,11  
**magical** 471:8  
**magically** 82:3  
**magnitude** 497:17  
**Mahalo** 156:20  
**main** 137:10,11 180:9  
 187:20 221:17 348:14  
 381:18 427:15  
**Maine** 135:11,15 285:3  
 508:17  
**maintain** 189:17 207:12  
 401:13 452:4 453:3  
**maintained** 268:1  
**maintaining** 51:2 59:4  
 103:11 156:16 315:4  
 447:10  
**maintenance** 207:20  
 323:4 328:12 458:15  
**maize** 64:2,4  
**major** 122:18 267:21  
 280:17 305:6 307:10  
 307:16 308:20  
**majority** 72:8 98:1  
 161:14 274:20 278:5  
 280:1 313:19 340:13  
 341:13 385:10 426:5  
 427:16,18 428:6  
 433:6 442:17 482:5  
 489:13 490:1 491:16  
 495:15 532:13  
**make-up** 77:11  
**maker** 76:10  
**making** 6:13 20:21 21:3  
 22:1 26:8 54:3 100:7  
 101:11 109:2,7 113:3  
 129:6 145:21 189:3  
 198:4 262:19 414:1

423:8  
**male** 148:16  
**maltodextrin** 171:6  
**mammalian** 150:21  
**mammals** 148:15  
**man** 60:21 295:11  
 527:5  
**manage** 22:21 24:20  
 57:6 286:20 414:20  
 452:14 465:8  
**managed** 290:7 451:16  
**management** 3:9 10:11  
 19:5 23:1,3 117:11  
 119:7 156:4,4 225:8  
 225:10 250:5,6,7  
 417:11 452:9 484:3  
 504:5  
**manager** 2:2 142:14  
 158:4 179:15 182:7  
 302:15  
**managers** 286:19 287:4  
**managing** 118:20  
 191:15  
**mandate** 112:4  
**mandated** 112:5 267:4  
 457:18 458:17  
**mandatory** 421:4,5  
**manganese** 4:14  
 357:20 358:9 359:10  
**manifest** 213:22 214:1  
**manner** 105:13,16  
 134:14 209:21 260:5  
 347:8,13  
**manual** 5:14 113:6,9,16  
 131:11 333:16  
**manufacture** 223:1  
**manufacturer** 126:10  
 166:10 179:16 222:15  
**manufacturers** 133:18  
 159:5 184:17 262:4,6  
**manufactures** 403:6  
**manufacturing** 39:3  
 181:20 185:21 193:8  
 352:2  
**manure** 13:2 60:17  
 104:18 246:2 308:19  
 402:7,9,14 403:8,14  
 403:17 405:10,16  
 406:13 409:8,9,12,13  
 409:20 410:3 412:20  
 413:2,3 414:7,8,12  
 420:4 509:9,11  
**manure-based** 411:2  
**manures** 406:14 465:9  
**manuring** 484:5  
**March** 228:16 365:10  
 472:21  
**Margaret** 244:19,20

**marginalize** 95:13  
**Marianne** 2:15 196:4  
 200:1,5  
**marine** 42:22 105:11,20  
 105:22 106:13,17  
 107:2 133:18,20  
 134:2,6,8,12,17  
 135:16 384:4  
**Marisol** 3:9 265:11  
 269:17,18  
**maritime** 213:14,19  
**Mark** 244:18  
**market** 54:9 56:9 64:22  
 117:10 162:12 163:12  
 171:7 178:13 179:8  
 182:14 183:7 184:20  
 191:15 245:11 278:4  
 372:9 442:13 444:4  
 446:5 457:15 493:6  
 505:12,13,19  
**marketer** 180:4 210:12  
**marketers** 215:10  
**marketing** 179:15 193:8  
 210:10 236:21  
**marketplace** 15:18 39:5  
 214:17 285:9 362:17  
 457:13 491:22  
**markets** 12:18 108:17  
 160:21 173:4 214:12  
**Marlin** 53:12  
**marmalades** 181:8  
 184:19  
**Marni** 2:21 40:4 49:17  
 49:18,21  
**Martine** 190:9  
**Marty** 3:7 231:9 240:5,6  
 240:9 243:21 247:15  
 248:5,8 384:15  
**mass** 184:1,10 276:4,7  
 276:10 277:6  
**Massachusetts** 8:7  
 12:21 13:12 14:2  
**massive** 139:16 215:13  
 313:22  
**massively** 317:21  
**master's** 502:4  
**match** 128:17  
**material** 117:2 148:20  
 155:5 164:14 174:20  
 179:2 186:7 223:13  
 273:17 276:7,10  
 279:9,12 288:19  
 289:2,13 292:11  
 293:8,19 294:6  
 295:20 296:3 300:5  
 310:9 322:8 324:1  
 329:15 337:17 342:7  
 355:1 357:15 358:20

360:14 363:7 364:3  
 365:9 375:1,1 376:10  
 380:4,21 382:9,13  
 383:5 386:14 389:5  
 401:20 402:3,13  
 404:4 405:19 407:18  
 408:3,9 411:7 416:6  
 437:18 438:12,13  
 450:6 453:14 487:16  
 502:11,13  
**materials** 2:4 4:8 20:22  
 41:16 42:15,17,22  
 51:7 92:4 101:15  
 102:3,12 105:3  
 106:13,17 109:4  
 116:19,21 117:1  
 133:20 134:2,12  
 139:18,20 177:16,19  
 177:20 178:3,9,22  
 179:6 202:10 221:20  
 227:17 238:11,18  
 239:10 256:15,22  
 258:2,14,21 259:9,12  
 259:16,20 262:16  
 270:7,12 287:19  
 289:2 321:1,6,11,14  
 322:1,5 324:2,13  
 331:12,14 345:2  
 346:20 347:8,16  
 352:4 362:21 363:2,4  
 363:6,8 365:1,4,14  
 382:18 384:4 387:20  
 393:16 401:4,15  
 403:20 405:2 406:9  
 406:20 408:11 414:21  
 415:4,8,9 417:13  
 438:20 452:8  
**matrix** 450:3  
**mats** 537:17  
**matter** 63:5 75:15 84:1  
 107:4 156:16 259:21  
 263:1 282:10 310:15  
 404:2 419:6 435:20  
 436:4,6 438:8 439:6,9  
 439:10 440:12 452:5  
 542:6  
**matters** 6:8 202:11  
**Matthews** 156:14 158:4  
**mature** 23:12,14 41:19  
**maturing** 41:8  
**Max** 2:17 282:3 302:12  
 312:6,8,10 315:10,11  
**maximize** 24:19,19  
**maximum** 321:18  
 402:17  
**Maxwell** 2:17 312:11  
**Mayfield** 3:6 248:13,14  
 252:18 253:16

**Mayfield-Davis** 240:6  
**McEvoy** 212:5 217:21  
**McMILLAN** 3:6 146:19  
 149:20,22 150:1  
 152:18 153:7,17  
**meal** 22:12,12  
**mean** 13:19 14:21  
 16:21 36:12 61:8,11  
 65:8 75:10 79:6 88:3  
 91:20 112:6 120:16  
 128:3 137:10 174:19  
 175:2,11 186:14,15  
 238:4 244:19,21  
 245:3 264:10 279:3  
 297:11 306:1 319:7  
 319:14 320:7 330:3,7  
 330:11 332:15,20  
 378:13 382:5 383:3  
 384:21 385:2 390:11  
 393:15,16 408:22  
 411:1 423:11 454:22  
 455:9,12 463:14  
 464:9 499:11 506:17  
 508:5 516:11 521:18  
 522:11 523:20 527:16  
 533:13 535:11  
**meaning** 43:7 472:5  
**meaningless** 64:1,3  
**means** 16:22 38:17  
 42:21 49:7,15 81:18  
 81:18 106:6 238:7  
 275:9,10,12 496:3  
 517:1,1 531:6  
**meant** 33:3 420:3 460:3  
 514:17  
**measurable** 113:21  
 131:16 167:14  
**measure** 14:18  
**measurements** 135:8  
 490:7  
**measures** 112:22 207:5  
**Meat** 243:5  
**mechanical** 467:13  
**mechanism** 383:12  
**mechanized** 508:1  
**media** 21:2 23:5 32:21  
 34:11 65:21 66:5  
 103:22 155:21 248:21  
 447:17,19 451:7  
 452:6,17 453:8,12  
 478:7,18 487:16  
 488:20 490:3 537:13  
**mediating** 499:4  
**medical** 80:9  
**medium** 10:16 200:15  
 304:4,5 311:13  
 437:18 472:14  
**meet** 20:15 66:18,21

67:6 92:22 105:2,4  
 110:5 111:3 113:13  
 130:13 181:10 182:14  
 190:6 195:20 200:19  
 219:11 228:15 285:13  
 295:21 308:8 336:19  
 410:5,8 441:4 451:2  
 454:17 455:10 456:14  
 459:2 463:12 480:4,4  
 517:16 521:11 539:19  
 540:6  
**meeting** 1:5 5:15 8:22  
 40:13 41:18 45:11  
 48:12 58:9 67:19  
 91:19 100:22 101:1  
 104:7 120:20 127:3  
 131:10 139:18,19  
 142:17 158:2 165:3  
 165:11 184:22 197:14  
 202:11 208:10 215:3  
 215:6 218:15 241:17  
 242:13 244:22 247:19  
 247:20 248:9 254:7  
 255:10 264:19 292:1  
 294:1 314:22 338:16  
 374:22 399:22 428:21  
 443:9 448:4 480:5  
 509:13 525:15 534:12  
 534:16  
**meeting's** 50:7  
**meetings** 27:18 67:21  
 98:8 225:17 377:3  
 443:10 459:17  
**meets** 61:17 201:5  
 298:5 336:14 402:6  
 407:22 521:13  
**Melinda** 3:6 240:6  
 248:10,11,14  
**member** 18:15,21 46:17  
 55:2 99:15 168:1  
 178:6 207:22 210:14  
 481:17 513:12  
**members** 6:1,9 8:8 9:17  
 19:20 27:3 28:7 32:17  
 34:6,7,10 40:11 47:16  
 49:12 54:15 77:20  
 78:7 93:18 94:14  
 96:21 99:11,21  
 121:19 129:18 133:13  
 177:10 189:14 191:11  
 220:16,18 225:22  
 240:2 242:7 254:1  
 258:17 259:4,5,15  
 260:16 262:15 272:17  
 282:8,14 298:7 314:4  
 314:15 315:4 333:15  
 341:11 379:4 419:10  
 419:18,20 443:12,18

446:1 463:12 474:7  
 476:18 493:21  
**membership** 65:3  
 254:13  
**memo** 217:20,20  
 403:21  
**memorandum** 42:13  
 124:5  
**memory** 37:6 263:22  
**mention** 180:5 223:9  
 319:16 340:11 342:19  
 493:11 519:14  
**mentioned** 23:18 32:14  
 32:16 44:5 75:4 77:4  
 97:13 152:6 163:2  
 175:7 180:16 192:8  
 195:3 223:8 235:5  
 237:19 247:5 323:15  
 405:13 428:6 479:14  
 483:1 493:20 510:19  
**mentor** 470:18  
**mentors** 9:1  
**meringue** 256:18  
**merit** 9:11  
**merits** 9:19  
**Merrigan's** 243:14  
**Mesh** 3:7 231:9 240:6,9  
 240:9 243:19 244:9  
 244:13,17 246:6  
 247:12,17 248:6  
**mesophilic** 405:14  
 407:12  
**mess** 242:9  
**message** 218:14 306:9  
**met** 1:8 14:20 32:5 33:1  
 34:13,18 156:1  
 450:13 453:20 472:16  
**meta-analysis** 496:11  
 497:13  
**metabolism** 280:8  
**metabolites** 499:6  
**metabolize** 273:16  
**metabolized** 274:9  
**metabolizing** 274:16  
**Metaphorically** 522:9  
**meter** 276:8,14 277:12  
**methanogenic** 401:14  
 401:17  
**methionine** 151:16  
 152:5 302:19,22  
 303:5 304:6,15,18  
 306:4,11,17,19 307:1  
 310:1  
**method** 92:14,21 93:7  
 102:10 109:19 201:13  
 202:5 222:8,14 234:7  
 234:11 274:22 413:8  
 413:16 493:13

- methodology** 405:8  
**methods** 27:20 51:14  
 106:19 109:3,7,9,10  
 109:16,17 111:12,15  
 111:18 123:2,4  
 136:11,21 190:3  
 205:6 208:6 256:4,7  
 274:14 335:16 339:11  
 352:2 403:17 444:7  
 445:2 452:11 479:5  
 505:2 506:3  
**methoxyl** 183:12,20  
 187:1,15  
**Mexico** 36:5 39:18  
 78:11,13 189:1 243:7  
 283:6 470:22 498:7  
**micelle** 194:6  
**Michael** 243:8 244:19  
 517:9  
**Michelle** 2:1 5:7,9 6:12  
 240:2 247:18 248:2  
 320:21 427:11 465:18  
 504:10  
**Michigan** 2:12,12 18:11  
 18:16 28:18  
**micro-organic** 504:22  
**microbe** 279:1 280:3,3  
 280:4,5,9  
**microbes** 273:16 274:6  
 274:6 275:15,21  
 280:11,20  
**microbial** 448:11,12  
 452:8 498:20,21  
**microbiologist** 407:5  
**microgreens** 173:3,20  
 192:3  
**micrometer** 276:13  
**micronutrient** 354:20  
 356:4  
**micronutrients** 4:13,13  
 106:9 354:5,9 355:5,8  
 356:14 357:17,18  
 358:3,16,19 359:8  
 465:21 468:7  
**microorganisms** 275:5  
 275:18 439:12  
**microphones** 391:21  
**microscope** 174:12  
**mid** 31:14  
**mid-** 376:12  
**middle** 117:17 384:8  
 460:8 463:13 517:4  
**middles** 288:16 289:12  
**Midwest** 12:2 86:14  
 309:19 334:1 491:13  
**migration** 250:9  
**miles** 135:14 212:5  
 217:21 218:5 456:21  
 469:3  
**military** 514:2  
**milk** 181:17 194:5,20  
 253:9 306:18 307:6  
 314:9,9  
**milking** 515:18 516:16  
**milligram** 276:8  
**million** 150:5 270:20  
 305:17,19 306:2  
 311:16 312:21 469:21  
 485:19 497:6,7,7  
**millions** 215:17  
**millipedes** 449:3 516:1  
**mills** 215:21  
**mimic** 10:9 196:22  
 500:20  
**mind** 84:13,20 122:10  
 213:17 232:20 318:20  
 477:14 482:21  
**mine** 18:4 90:2 487:11  
**mineral** 29:2 125:9  
 390:4,4 439:8,11  
 440:13  
**mineralizing** 440:12  
**mingling** 119:1  
**minimization** 446:16  
**minimize** 24:21 207:9  
 466:13  
**minimizes** 347:8,13  
**minimizing** 98:17  
 191:13  
**minimum** 76:18 150:18  
 190:6 297:12 402:16  
 453:13 512:22  
**Minnesota** 499:21  
**minor** 196:21  
**minorities** 34:22  
**minority** 51:17 118:8,15  
 427:16,19 428:6  
 441:19 442:3,5,16,20  
 442:22 444:14 445:10  
 445:13,14 446:7,9  
 448:2,14 451:13  
 475:22  
**mint** 102:2  
**minute** 248:1 414:8  
**minute's** 496:3  
**minutes** 5:16,18 18:6  
 49:15 142:17 221:8  
 235:5 240:20 247:20  
 254:18 316:20,22  
 399:14 428:1 459:9  
 459:12 476:14 486:19  
 487:7 515:16  
**mirror** 82:3 93:6  
**miscommunication**  
 384:9  
**misconception** 134:17  
 206:4  
**misinterpretation** 28:2  
**mispronounced** 196:4  
**missed** 378:5  
**missing** 101:5 227:10  
 491:8  
**mission** 260:18  
**Mississippi** 495:5  
**Missouri** 475:2  
**mistake** 68:14 497:22  
**misted** 432:13 531:12  
**misunderstood** 148:17  
**Mitchell** 3:8 167:17  
 172:20,21,22 175:1,8  
 175:16,18,21 176:8  
 176:20  
**mite** 155:1 230:7,8,15  
 340:21 343:8 344:15  
**mites** 227:5 229:8,10  
 230:2,16,17 345:8  
 449:3  
**mitigate** 42:21 197:19  
**mitigating** 63:16  
**Mitigation** 467:10  
 468:16  
**mix** 374:10 396:19  
 398:1  
**mixed** 15:12 401:9,11  
 402:12 405:3  
**mixes** 172:4 401:20  
**MOA** 28:14 474:7  
**mode** 361:19  
**model** 37:19 127:6  
 128:21 212:21  
**models** 62:17  
**moderate** 224:3  
**Modernization** 207:12  
 271:13 403:13  
**modifications** 192:14  
**modify** 29:3  
**moisture** 250:7 304:7  
 306:1 402:17 403:7  
**molybdenum** 4:14  
 357:20 358:9 359:11  
 359:12  
**moment** 5:22 395:17  
**money** 38:13 70:1  
 217:1 287:7  
**monitor** 136:5 179:8  
 336:3 434:17 468:11  
**monitored** 136:11  
**monitoring** 108:20  
 337:4,18 345:4  
 434:18 466:10  
**monocots** 223:15  
**monocytogenes**  
 271:18  
**monohydric** 375:7  
**monomers** 280:17  
**monosodium** 168:14  
**Monsanto** 68:19  
**Montana** 210:14  
**month** 173:21 174:1  
 228:11  
**months** 21:2,14 22:5  
 108:22 215:2 216:14  
 217:22 440:8 526:19  
**monumental** 463:9  
**mood** 319:9  
**morning** 5:4 8:2 36:2  
 49:14,21 53:16 57:2  
 67:13 93:13 102:21  
 107:18 108:2 116:11  
 122:13 129:22 133:12  
 133:14,20 138:13  
 139:15 142:13 146:20  
 147:1 167:18 193:4  
 213:6 221:3 225:6  
 252:21 541:20  
**Mortensen** 1:16 46:16  
 47:11,20 49:9 63:18  
 64:8,14 129:11  
 139:14 209:14,22  
 210:3 213:5 214:5  
 237:10,16,18 290:3  
 291:5 325:17 326:15  
 327:12 334:14 339:17  
 343:17 346:16 349:19  
 351:1 353:3,20 357:8  
 360:6 367:1 368:3  
 370:8 373:6 377:6  
 385:21 389:7 394:8  
 397:5 398:10 416:11  
 418:15 427:1 494:22  
 527:1 532:4 536:18  
 539:2 541:8  
**MOSA** 3:12 142:14  
**moss** 448:21  
**MOSSO** 1:16 16:2  
 64:17 96:19 97:2,6,11  
 97:15 111:10 165:15  
 165:21 172:10 236:9  
 236:13,16,19,22  
 237:2,5,7 325:15  
 326:13 327:10 334:12  
 340:7 344:7 346:14  
 349:17 350:21 353:18  
 357:6 360:4 366:21  
 368:1 370:6 373:4  
 385:19 397:3 398:22  
 407:7 411:1 413:6  
 417:1 418:13 426:21  
 441:20 454:16 455:3  
 455:6 504:12 532:2  
 536:16 538:22 541:6  
**mother** 37:13 474:2

**motions** 324:2,22 325:6  
360:20 523:22 524:16  
527:3,5  
**mouse** 313:17  
**mouth** 63:14 249:15  
322:21  
**mouthfeel** 168:22  
181:15  
**move** 31:9 46:22 49:11  
58:16 67:11 68:10  
93:9 109:19 115:19  
116:9 124:7 126:5  
142:3,8,9 176:18  
203:19 256:14 281:16  
291:22 293:5 366:1  
369:14 373:19 426:1  
481:14 488:9 530:3  
**moveable** 12:14  
**moved** 294:3 325:9  
396:3  
**movement** 9:4 17:20  
37:11 233:18 461:10  
**moves** 53:9  
**moving** 104:1,10  
107:12 116:7 226:21  
320:13 328:8 340:19  
351:9 368:19 394:12  
478:10,11 525:18  
**mow** 330:5,9 331:19  
332:1,13 333:7  
**Moyer** 9:3  
**MRSA** 250:15 251:14  
**mud** 233:20  
**Muir** 243:6  
**mulch** 4:10 104:22  
273:8,18 274:5,18  
275:4,13,16 276:2,12  
277:17,20,21 279:9  
289:11 335:8,14  
336:10,18 337:12  
338:11 339:8  
**mulches** 289:5,7  
335:13 338:18 488:22  
**multiple** 23:12 192:16  
206:18 249:3 262:4  
262:10 348:9 361:15  
362:8 501:11,15,18  
501:18 527:3,4  
**multitude** 207:8  
**mushrooms** 192:6  
317:12  
**mutual** 141:12  
**mutually** 444:16  
**mycorrhizae** 59:3

---

**N**


---

**nail** 66:7  
**name** 6:5 7:22 8:4 18:9

18:10 31:21 35:22  
40:5,7 49:19,21 57:1  
57:3 67:13 81:1 93:11  
93:13 99:8,12 102:21  
107:18 116:11 121:14  
126:7 128:11 129:20  
129:22 133:11,15  
138:13 142:11 146:22  
147:2 149:21 154:5  
167:18 172:22 177:1  
177:3 179:11 182:4,7  
183:4 189:10,13  
193:4 196:5 200:3,4  
200:11 204:20 211:13  
221:2,3 225:5,6  
231:10 240:7 248:11  
254:2 260:4 265:12  
269:18 273:5,6  
282:18 283:2 291:10  
302:14 312:8 315:16  
362:4  
**names** 183:3 263:14  
**naming** 134:4  
**nano** 106:4,7  
**nanomaterials** 106:3,6  
**nanoscale** 106:9  
**nanotechnology** 106:3  
**Nate** 53:15 56:18,20,22  
57:3 60:8 64:17 67:9  
**NATHANIEL** 3:4  
**national** 1:3 2:2,2,3,4,4  
2:6,10 3:16 33:22  
34:3,4 40:19 42:18  
51:1 100:4 101:2  
107:6 116:21 121:18  
126:13 129:1 147:3  
148:13 158:1,6  
167:22 168:6,13  
177:13 178:15 191:7  
226:15 227:13,18  
228:7 250:18 259:9  
259:13 260:8,14,17  
260:19 261:1,14  
262:19 264:15 270:8  
270:18 278:11 321:9  
368:20 374:17 392:19  
397:22 411:22 460:16  
475:4  
**nationally** 107:21 130:3  
**nationwide** 150:5  
**native** 4:4 42:2 57:14  
142:18,22 143:11,13  
144:18 198:18 199:11  
**natural** 2:9 57:18 75:8  
90:12 100:6 103:12  
161:7 169:1 230:17  
237:22 257:2 260:12  
291:12,22 297:2

318:18,19,20 369:18  
371:13 453:3 458:16  
496:1 512:5 513:17  
**naturally** 135:22 177:14  
179:17 209:16 222:3  
222:6 237:12,22  
271:7 351:11  
**nature** 2:22 6:16 10:18  
37:2 38:2 50:2 231:11  
279:20 431:22 487:2  
496:11 515:10  
**natures** 408:12  
**NatureServe** 145:16  
**NatureSweet** 2:21  
**naughty** 455:22  
**Nazarro** 200:2  
**Nazzaro** 3:8 204:19,22  
205:1 208:16 209:3,6  
209:18 210:2,5  
**near** 7:9 51:21 173:14  
256:15,19 329:18  
**nearby** 205:2  
**nearly** 41:9 131:17  
272:5 312:21  
**Nebraska** 495:6  
**necessarily** 12:10  
26:11 66:13 143:16  
409:11,16 410:7  
466:2 481:12 518:22  
521:3 524:11 539:15  
**necessary** 42:17 49:16  
57:19 123:6 129:19  
132:16 144:1 147:15  
268:2 316:16 341:16  
364:3 383:19 385:11  
429:22 533:14  
**neck** 320:6  
**need** 16:14 17:14 20:6  
23:4,15 41:19 42:15  
44:1 48:21 49:3 52:22  
54:5 58:18 59:20  
61:12 62:21 63:12  
64:6,9 66:12 69:1  
70:4 85:18,19 88:18  
89:22 90:17 104:6  
107:22 115:22 117:2  
117:11 122:20 126:3  
129:3,18 130:4 140:1  
143:13 144:17 146:6  
149:3,5 150:17  
163:19 166:16 171:13  
178:22 190:1 192:11  
202:21 212:22 218:7  
218:20 219:22 250:3  
253:13 257:5 258:22  
259:19 260:10 262:16  
267:2 268:19 270:6  
285:9 295:20 297:14

298:1 306:1 312:3,15  
315:8 318:7 319:21  
323:2,9 330:11 355:1  
366:10 385:3 422:4  
424:6 455:10 457:14  
475:9 476:1 484:18  
492:6,14 493:22  
499:15 506:3 511:16  
514:13 526:12 537:10  
**needed** 48:15 101:6  
102:6 152:9 162:11  
170:5 255:15 259:17  
278:13 428:15 446:18  
447:22  
**needs** 23:7 104:4 111:3  
118:17 127:10 144:7  
144:8 180:19,22,22  
182:14 204:11 224:16  
263:5 266:14 268:6  
314:2 409:20 446:2  
**negative** 119:11 134:16  
161:20 235:21 348:2  
406:16 481:12 489:5  
**negatively** 414:6  
**neglectable** 276:18  
**neighbor** 68:21  
**neighborhood** 467:5,8  
**neighbors** 469:4  
474:22  
**neither** 203:2 512:20  
**nematodes** 431:19  
449:5  
**nests** 516:3  
**net** 489:5,5  
**Netherlands** 495:7  
**network** 214:19  
**networks** 64:18  
**neutral** 63:9 169:9,12  
**never** 10:1 20:5 28:5,7  
30:22 34:16 35:4  
82:17 106:7 149:6  
192:7 310:8 330:2,7  
527:11  
**new** 23:2 36:4,11,16  
39:18 40:18 44:1,6  
46:16 54:21 58:12  
82:5 83:2 89:9 92:12  
92:19 117:12 123:20  
128:20 187:7 191:3  
202:12 203:3 205:4  
231:22 232:12,15,16  
243:7 258:5 271:10  
278:18 288:16 336:8  
396:2 448:2 451:12  
476:4 495:6 498:2,4,7  
502:10,13 524:22  
**news** 311:15 475:4  
**NHC** 269:21 270:4

272:14  
**nice** 304:10  
**nicotine** 4:16 371:2  
**night** 25:12 88:19  
 503:18  
**nightshades** 296:15,19  
**nine** 18:14 208:3  
 284:17 386:11  
**nitrate** 124:3 242:15,20  
 440:2,9,13  
**nitrites** 206:9 207:4  
 354:11 358:5  
**nitrification** 207:1  
**nitrifying** 207:1  
**nitrites** 207:3  
**nitrogen** 14:19 21:22  
 22:3,13,14 59:5,9,12  
 103:18 126:15 175:22  
 176:2 206:9 223:2  
 433:17,19,21 434:5,9  
 434:10,11,14 435:1,2  
 435:14 436:10,15  
 437:7,19 438:21  
 439:15 441:5,7,11  
 488:2 501:14,19  
 537:21 538:1,4  
 539:20,22 540:7,9,13  
**no-spray** 467:6,8  
**no-tillage** 406:8  
**Nobel** 497:22  
**NOC** 34:2 123:2,9 147:8  
 147:13,22 148:11  
 420:20  
**nodosum** 134:18  
**NOFA** 12:20  
**NOFA/Mass** 2:11  
**nominated** 78:4  
**non** 223:1 224:18 266:9  
 267:3  
**non-** 184:10 211:4  
 345:5,15  
**non-amidated** 162:5,18  
 177:13 178:15  
**non-animal** 171:19  
 411:4  
**non-arable** 447:2  
**non-certified** 8:9  
**non-containers** 453:6  
**non-gmo** 56:14 425:7  
**non-organic** 425:8  
**non-production** 221:9  
**non-retail** 197:6,9  
**non-soil-based** 444:13  
 444:15 446:8 448:1  
**non-starch** 184:11  
**nonagricultural** 198:2  
**Nonanoic** 222:20  
**noncontinuous** 114:17

**nonfat** 306:18 307:6  
**nonissue** 378:17  
**nonorganic** 100:3  
 114:18 421:9,22  
 425:13  
**nonprofit** 107:20 130:2  
**nonsense** 516:18,20  
**nonsynthetic** 100:13  
 198:3 368:14,21  
 371:11 372:11 396:18  
 416:2,3,8  
**nonvolatile** 102:10  
**nonylphenol** 45:4  
 124:12  
**NOP** 18:22 30:4 31:1  
 33:19 35:10 40:14  
 41:5 43:12 68:14  
 72:14 106:2 118:19  
 120:8 122:14,18,22  
 123:18 124:7 125:15  
 130:10 132:13 133:13  
 133:22 156:7,10,19  
 198:5,8 200:7 211:4,9  
 212:3 215:1,2,3  
 217:10 218:3,9,14  
 219:9 226:1 254:1  
 262:8,12 264:7  
 265:17 266:15,17,22  
 272:10 279:5 291:15  
 291:19 302:2 314:16  
 323:16 374:14 376:12  
 380:13 400:14 403:8  
 405:5,15 412:14,19  
 428:15 429:7,19  
 443:5 445:4 446:2  
 447:21 453:19 461:12  
 494:10,19 515:5  
 520:12 524:21  
**NOP's** 266:20  
**NOPs** 106:4 110:2  
 122:12  
**norm** 83:15  
**normal** 36:14 172:7  
**normally** 18:1 434:12  
 450:1,10  
**Norman** 499:22  
**North** 292:22 391:3  
 495:5  
**Northeast** 8:6 29:18  
 86:14  
**northeastern** 63:3  
 78:15  
**northern** 173:4 230:6  
 230:17  
**northwest** 3:9 269:19  
 269:20 270:15 271:3  
 474:15  
**Norway** 138:6

**NOSB's** 151:3 449:18  
**NOSBs** 117:16 130:8  
**NOSP** 358:21  
**not-so-beautiful** 477:6  
**notable** 167:15  
**note** 123:14 166:6  
 209:11 353:8 407:16  
 416:9 461:10  
**noted** 147:18 154:20  
 161:15 198:18 201:6  
 341:18 356:2 371:12  
 445:4 481:4 505:16  
**notes** 49:2  
**noteworthy** 272:8  
**notice** 129:16 315:14  
 418:22 493:10  
**noticed** 470:3 495:21  
**notified** 292:2  
**nourish** 511:13  
**nourishment** 39:8  
**November** 1:7 150:10  
 228:10 374:11  
**NPEs** 124:12  
**NPK** 500:12  
**NRCS** 449:10  
**number** 77:19 92:10  
 98:13,19 120:13  
 134:5 150:16 169:22  
 186:14 197:9 269:2,2  
 270:5 294:9 297:2  
 303:14 305:16 310:7  
 320:19 341:11 345:1  
 348:1 351:18 391:12  
 412:8 422:7 460:13  
 460:21 461:7 476:20  
 477:7 478:4 482:8  
 483:3,8 496:19 524:1  
**numbers** 64:10 431:18  
 461:6 496:19  
**numerous** 162:14  
 335:21 341:14 355:22  
 406:9 420:18,19,21  
 422:10 444:8 457:19  
 457:19 458:7  
**Nursery** 191:17  
**nurturing** 447:11  
**nutrient** 24:16 65:22  
 110:15 174:21 206:6  
 206:11 417:10 432:14  
 434:15 436:10,15  
 531:13  
**nutrient-** 499:1  
**nutrient-rich** 450:2,4  
**nutrients** 22:8 86:8  
 92:2 103:9 123:15,21  
 124:2 125:12,19  
 126:1 191:2 205:11  
 205:21 287:18 317:16

317:17 432:21 433:2  
 433:4 434:5,6,7,13  
 435:9,11 439:2  
 440:19 452:15,17,19  
 467:15 478:17 498:16  
 503:16 532:16,19,20  
**nutrition** 160:14 175:6  
 192:6 289:4 470:11  
 501:14  
**nutritious** 82:12 94:3  
 96:10  
**nuts** 307:9

---

**O**


---

**o'clock** 282:7  
**OAD** 154:22  
**OAKLEY** 1:17 18:1  
 43:11 62:7 106:12,15  
 136:18 145:13 146:1  
 152:12 163:1 175:13  
 175:17 185:5,9  
 198:16 199:2 223:22  
 224:7,12 286:2  
 301:22 326:2,22  
 327:19 329:14 334:21  
 338:3 340:2 342:13  
 344:2,20 346:9  
 349:13 350:16 352:12  
 352:16 353:13 357:1  
 359:21 361:6 362:20  
 363:8 364:6,12,14  
 366:16 368:10 370:15  
 373:13 376:7 380:10  
 382:5 386:6 388:20  
 390:8,17 394:1  
 395:10 397:12 398:17  
 399:7,13,16 400:17  
 408:21 409:7 410:13  
 412:6 413:5,18  
 414:16 415:12,17  
 416:18 418:8 419:16  
 420:2 423:10 426:16  
 459:14 519:13 522:22  
 531:19 533:9,15  
 534:1,21 535:2,11  
 536:11 538:16 541:1  
**oat** 114:10  
**oats** 114:9  
**object** 161:8  
**objected** 80:2  
**objection** 529:21,22  
 530:2,5  
**objections** 436:17,19  
**obligated** 463:6  
**observer** 313:5  
**observing** 178:4  
**obtained** 177:18 199:11  
 409:5

- obtaining** 249:21  
**obvious** 85:22 213:9  
**obviously** 213:8 245:19  
 311:20 393:18 407:7  
 443:10,15 447:21  
 511:10  
**OCAs** 93:22  
**occasions** 389:8  
**occluded** 22:18  
**occupational** 322:18  
**occur** 406:2  
**occurring** 161:8 222:3  
 222:6 271:8 351:11  
**occurs** 138:2 148:15  
 179:17  
**OCA** 472:16,18  
 483:16 508:10 515:3  
**octanol** 374:10 375:6  
 396:19  
**octanol/decanol** 398:1  
**October** 221:15 355:13  
 470:1  
**odd-numbered** 222:5  
 222:11  
**Odessa** 212:19  
**OEFFA** 2:11 138:15  
 140:16,17,21 141:14  
**OFARM** 2:13 211:17  
 212:4 214:18 216:3  
**off-farm** 488:18,20  
**offense** 80:15 511:4  
**offer** 139:15 141:19  
 205:5 457:21 482:6  
**offered** 139:4  
**offers** 482:22  
**office** 499:20  
**official** 2:6 301:3  
**officially** 237:12  
**OFPA** 27:12 33:1 34:13  
 42:11,19 50:16 54:1  
 103:10,16 104:3  
 156:1,3,9 313:10  
 316:5 317:5 343:11  
**Ohana** 2:10 154:7  
**Ohio** 138:14 210:15  
**OID** 263:11  
**oil** 139:2 177:21 185:19  
 390:3,4,4,5  
**oils** 102:2,11  
**okra** 246:17,18  
**old** 22:7 113:6 143:20  
 173:18 497:10 518:13  
**oligofructose** 263:22  
**OLPP** 153:11,14,15  
 226:19 228:10 312:3  
**Olympia** 57:7,10  
**omits** 160:6  
**Omni** 1:9
- omnivore** 449:5  
**OMRI** 338:9 371:13  
**OMRI's** 402:13  
**OMRI-approved** 125:2  
 362:3  
**OMRI-certified** 175:9  
**on-** 467:14  
**on-farm** 336:22  
**on-site** 313:4  
**once** 109:22 149:6  
 219:6 308:12 324:8  
 360:18 515:19  
**one's** 115:11  
**one-third** 216:5  
**OneCert** 155:18  
**ones** 17:12,13 23:12  
 146:8 182:18 247:2  
 260:16 279:2 286:5  
 409:16 510:21 511:11  
**ongoing** 105:9 108:11  
 111:1 130:8 133:22  
 141:1 336:3  
**online** 98:6  
**onus** 408:19  
**open** 5:22 48:11 49:6  
 136:20 139:13,17  
 145:15 148:18 157:8  
 220:19 264:14 288:16  
 289:12 380:12 384:16  
 454:9 477:14 492:11  
**open-air** 457:6  
**opened** 33:4 91:6  
**opening** 33:5,8  
**operated** 303:9 391:1  
**operating** 72:21 80:11  
 119:5 261:21 434:11  
 451:5,13 463:1  
**operation** 39:18 57:21  
 103:13 185:18 197:2  
 197:3,3 287:10  
 409:10 451:6 454:13  
 462:8 469:19,21  
 478:3 479:1 480:19  
 480:20 485:21 509:14  
 521:13  
**operations** 4:5 11:17  
 42:1 63:12 75:5,13  
 79:13 97:19,20  
 102:13 112:20 117:7  
 117:9,20 121:6 122:3  
 138:4 140:22 142:14  
 142:15 147:17 149:2  
 156:7,12,17 185:22  
 196:12,16,20 228:15  
 245:20 255:16,18  
 265:19 286:18 287:12  
 291:4 313:6 341:20  
 390:21 391:13 446:12
- 451:1 453:4 456:12  
 457:20 458:17 461:9  
 461:15,17,18 462:22  
 470:10 479:13 482:16  
 488:17,19 493:9  
 510:17,18 514:22  
 515:4 516:19  
**operators** 459:1  
**opinion** 16:5,6 24:2  
 59:6 62:19 64:1  
 111:12 428:2 487:14  
 487:15 490:6 506:4  
 527:2,2  
**opinions** 81:11 131:19  
 140:7 443:2 445:14  
**opportunities** 147:22  
 148:2,7,9 285:16  
 379:18 475:8 514:11  
**opportunity** 15:4 80:12  
 83:4 103:1 110:18  
 126:20 133:14 147:4  
 148:5 193:10 195:22  
 196:7 208:12 225:19  
 226:8 232:18 233:10  
 257:8 260:20 261:7  
 287:13 442:2 476:1,2  
 506:15 507:14 508:2  
 510:2,13  
**oppose** 81:13 221:12  
**opposed** 85:4 162:2  
 216:3,4 499:16 512:2  
**opposing** 95:8 97:9  
**opposite** 32:11 472:1  
 519:7  
**opposition** 460:9  
**optimal** 115:14  
**optimistically** 283:22  
**option** 120:22 183:17  
 184:17 201:16 317:14  
 396:9  
**options** 186:12 362:9  
 481:11  
**OPWC** 116:19 117:3  
 119:3  
**oral** 140:10 221:16  
 270:6  
**oranges** 177:17 179:1  
**orchard** 271:5,15,22  
 504:1  
**order** 57:19 58:16  
 156:12 304:8 310:16  
 324:19 336:19,20  
 385:9 391:9 419:12  
 426:5 445:12 497:17  
 514:13  
**Oregon** 154:11 270:1  
**organically** 32:9,22,22  
 34:11 95:19 132:10
- 132:11 155:22 179:3  
 223:12 240:13 249:5  
 290:10 391:6 456:22  
 472:14 518:14 520:20  
**organically-approved**  
 92:4  
**organics** 2:16 17:18  
 19:17 40:1 90:9  
 143:10 154:15,17,19  
 189:15 203:2 204:12  
 225:14 229:10 234:4  
 316:17 317:2 411:11  
 463:4 486:14 510:15  
 511:7,8  
**organization** 38:1 191:10  
 224:4  
**organisms** 140:19  
 157:5 329:17 335:15  
 339:10 365:2 411:6  
 415:1,5,11 438:9  
 447:14 448:15,16  
**organization** 127:9  
 283:13,20 364:4  
**organization's** 153:5  
**organizations** 47:6  
 83:12 127:7 216:9  
 341:21 345:13 371:9  
 378:3 509:12  
**original** 40:18 58:10  
 92:14 125:14 365:16  
 473:5,6,13  
**originally** 80:1 211:3  
**originating** 432:21  
 532:16  
**Orlando** 242:13 244:22  
**Orleans** 202:13  
**ornamental** 328:13  
**ornamentals** 317:12  
 430:22 434:1 441:13  
 538:6 540:15  
**OSA** 131:10  
**OSAs** 132:4  
**OSGATA** 36:5  
**OSPs** 90:13  
**OTA** 57:4 58:4 197:16  
 259:4,4 262:8 264:7,9  
 420:20  
**OTA's** 57:12 64:18  
**ought** 9:11 313:7  
**out-compete** 174:13  
**outbreaks** 411:3 469:18  
**outcome** 50:18 51:12  
 52:9,12,15 118:10  
 302:7 377:5 379:9  
 403:15  
**outcome-based** 481:5  
**outcomes** 50:22 51:5  
 51:15 52:16 73:10

**outdoor** 150:20,21  
 151:10 238:20,22  
**outdoor-based** 304:13  
**outdoors** 151:2 202:13  
 305:1  
**outer** 60:18 192:18  
 491:3  
**outlining** 59:7  
**outputs** 38:4 317:20  
**outreach** 80:13 261:15  
**outset** 14:18  
**outside** 79:6 144:10  
 191:19 275:21 419:19  
 419:22 452:21 458:6  
 470:10 513:8 514:9  
**outstanding** 150:16  
**outweigh** 197:18  
**over-harvested** 134:19  
**overaccumulation**  
 355:4  
**overall** 91:3 156:18  
 169:21 294:1 342:6  
 348:14 351:17,20  
**overcome** 178:19  
**overlapped** 155:14  
**overly** 81:16  
**oversight** 41:12 122:1  
 122:11,20 256:1  
 331:5 414:11  
**overtime** 76:19  
**overuse** 348:4  
**overview** 137:3  
**overwhelming** 347:21  
 351:20 352:7 456:3  
**overwhelmingly** 235:15  
 323:6  
**Ovieto** 3:9 265:11  
 269:17,18,19 273:2  
**owned** 173:2 200:22  
 303:9  
**owner** 67:14 75:8  
 509:13  
**owner-operator** 173:1  
**ownership** 513:14  
**oxalic** 154:22  
**Oxford** 141:2  
**oxidative** 364:18  
**oxide** 347:5  
**oxides** 4:13 357:19  
 358:8 359:9  
**oxidizing** 222:16  
**Oxnard** 283:4  
**oxychloride** 347:6  
**oxyntic** 394:9,12  
**oxytocin** 148:11,12,13  
 149:3,8

---

**P**


---

**P-R-O-C-E-E-D-I-N-G-S**  
 5:1  
**p.m** 247:19 282:11,12  
 419:7,8 542:7  
**P.S** 318:9,18  
**Pacific** 270:15 271:3  
**package** 101:3 139:19  
 173:20  
**packaged** 184:5  
**packaging** 209:8  
**packer** 272:13  
**packers** 269:21 270:10  
 271:12  
**packet** 254:10  
**packets** 251:11,11  
**packing** 271:6,15,22  
 272:3 332:16 341:7  
 341:17  
**page** 254:10,15 512:21  
**pages** 254:15  
**pain** 252:4,7 320:5  
**panel** 160:14 166:8  
 213:5 220:11 341:3  
**paper** 216:19 338:6,9  
 338:11 496:11  
**papers** 404:12  
**paperwork** 127:1  
 318:15  
**paradigm** 10:15  
**paradigms** 519:5  
**paragraph** 321:12  
 328:8 335:11 340:20  
 344:14 347:12 351:9  
 354:8 358:2 360:21  
 369:1 371:2  
**parallel** 66:22 383:20  
**parameters** 207:9  
 479:16  
**parasites** 151:9 227:5  
**parasiticide** 226:16  
 372:3,3  
**parasiticides** 149:10,15  
**Pardon** 60:20  
**parlor** 516:17  
**parse** 140:7  
**parsing** 534:2  
**part** 15:21 16:7 25:3,5  
 37:1 42:9 44:8 55:15  
 94:15 109:14 114:16  
 124:9 157:10 160:21  
 217:19,20 219:16  
 224:5 226:2 228:1  
 235:17 238:16 275:6  
 287:1 288:11 289:4  
 289:12 306:22 365:13  
 365:15 394:4 414:14  
 427:15 429:6 439:22  
 456:5 466:6 477:12

481:14 504:1,1  
 509:17  
**partially** 352:4 491:8  
**PARTICIPANT** 247:7  
 529:19  
**participate** 103:2  
 210:20 504:20 507:11  
**participated** 38:7  
**participating** 506:5  
**particles** 22:19  
**particular** 65:10 72:10  
 79:7 112:17 115:13  
 134:16 139:11,21  
 140:2 151:1 184:12  
 201:1 270:9 293:19  
 295:20 401:7 404:14  
 425:15 479:15  
**particularly** 19:20  
 24:19 159:14 162:7  
 291:1 292:22 296:17  
 296:19 481:19  
**parties** 472:1  
**partner** 226:17 287:9  
 287:15  
**partnerships** 287:2,2  
 287:11 514:11  
**parts** 13:8 90:9 188:19  
 472:4 497:5,7  
**party** 207:18 234:6  
 400:10  
**parvovirus** 250:17  
**pass** 116:2 120:12  
 131:4 255:7 303:3  
 516:6 521:19 522:13  
 538:10  
**passed** 42:11 100:21  
 101:1 129:17 145:20  
 146:2 197:14 497:6  
**passes** 367:10 397:19  
 417:5 427:4 532:9  
**passion** 284:6 480:14  
 525:6  
**passionate** 456:6  
 461:22  
**passionately** 456:13  
**pasture** 227:1,8 229:21  
 435:21  
**pasture-claimed**  
 303:10  
**Pat** 3:2 80:21,21,21,22  
 93:10,11,14 96:13  
**Pat's** 80:22  
**patchwork** 13:19  
**path** 110:18,20 111:5  
 287:14  
**pathogen** 402:20 404:6  
 405:1  
**pathogen-based** 410:7

**pathogen-free** 402:10  
**pathogenic** 410:22  
 415:1,5,10  
**pathogens** 104:16  
 271:8,17 272:12  
 290:12 308:21 404:12  
 404:13,15,18 405:22  
 406:1,18 407:14  
 414:3 417:16 465:10  
**patient** 161:13  
**pattern** 279:4  
**PATTILLO** 2:4  
**Paul** 2:3 499:21 528:5  
**pause** 281:17  
**paved** 9:12 201:2  
**pay** 70:1 76:19,22  
 122:11 314:2 337:2  
 422:14  
**paying** 96:9 98:22  
 359:10  
**PBAT** 280:13  
**PC** 70:4  
**peaceably** 316:11  
**peacemaker** 507:1  
**pears** 269:22 270:19  
 271:2  
**pebbles** 200:14  
**pectin** 2:8 126:9,12,13  
 162:6,10,18 177:5,7,9  
 177:10,13,14,15,18  
 178:2,7,8,11,15,20  
 179:17,18,21 180:6,9  
 180:11,14,14,16  
 181:2,4,7,12,12,16,19  
 182:10,11,13 184:2  
 185:2,7,15 186:6,13  
 186:17,20,21,21  
 187:1,5,9,11,14,15  
 188:7,22 189:3,5,7  
**pectins** 180:18 181:22  
 182:17,18 183:1,3,8  
 183:11,12,20 184:12  
 187:2,7,8  
**peek** 233:11  
**peel** 177:16 185:17  
 186:4,6 188:17,18,19  
 188:20,21  
**peer** 122:13,17  
**peer-reviewed** 161:17  
 404:12 405:9  
**pending** 202:1  
**Pennsylvania** 225:9,12  
 227:19 495:6  
**pens** 304:21  
**people** 16:12 18:18  
 20:19 31:7,11,12,16  
 34:16,21 63:20 69:8  
 69:22 70:4,6 71:6,13

- 73:19 75:21 79:1 88:2  
88:15 90:16 92:17  
95:6 126:16 157:15  
176:1,14 184:10  
187:20 202:3,20  
209:1 215:4 218:10  
218:15 231:16,16  
234:18 241:14 243:1  
243:3,15 244:21  
258:22 260:10 284:17  
286:3 287:3,7,14  
297:2 310:15 313:16  
316:17 320:2 330:9  
330:15 352:3 362:6  
385:3 387:14 389:19  
389:22 393:2 409:1  
428:10 434:21 442:5  
457:16 459:19 464:3  
464:7 465:12 469:11  
474:14,15 475:5,8,15  
475:22 477:11 482:8  
485:15 486:15 490:9  
495:22 502:17 504:19  
511:3 513:10 514:12  
514:17,21 520:8  
521:5 523:20 524:2  
527:4 533:16  
**peppers** 12:13 190:13  
**per-year** 63:8  
**peracetic** 272:8  
**percent** 22:1,2 59:11,12  
60:11,14,17 61:5 62:2  
64:3 69:15,20 73:17  
80:16 86:8,10 104:22  
105:7 135:18,21  
149:3 172:17 173:11  
174:2,5 177:11  
205:11,13 214:21  
216:6,7 236:19 252:3  
270:22 272:6 274:17  
275:9,11 276:18  
278:5,13,16 279:6,10  
303:13 304:17 305:3  
305:11,12,20,22  
309:15,16 311:2  
336:18 337:5 338:10  
402:3,18 410:11  
421:18 423:22 431:4  
431:5 433:16,18  
434:6,7,22 435:2,19  
435:22 436:5,12  
439:6 441:4,6 453:13  
460:19 461:1,1,3,6,14  
462:15 496:13 537:21  
538:1 539:19,22  
540:7,9  
**percentage** 86:20 278:2  
319:16 461:7  
**percentages** 87:18  
**perennial** 288:11  
355:10,21 356:3  
501:16  
**perennials** 51:11,13  
431:7 433:21 441:11  
538:4 540:13  
**perfect** 256:18 290:20  
310:2 441:22  
**perfectly** 216:3  
**perform** 161:1 164:2  
**performed** 223:17  
**performing** 149:1  
**performs** 164:11  
**perimeters** 328:13  
**period** 4:1 6:21 22:20  
23:14 104:13 142:21  
143:2,6 241:9 260:13  
318:8 417:19 496:14  
**periods** 104:18  
**permanent** 35:11  
**permissible** 272:10  
**permitted** 159:7 233:3  
233:5 301:15  
**person** 24:10 37:3  
148:4 261:10 325:3  
377:17 410:15 517:19  
**person's** 127:17,18  
**personal** 6:14 9:1 297:1  
297:3 388:13,18  
391:17 519:22  
**personalities** 232:3  
**personally** 16:14 47:12  
70:16 73:2,12 212:5  
260:21 289:22 297:17  
313:18 332:11 380:2  
387:13 389:10 393:17  
**persons** 148:4  
**perspective** 19:15 27:9  
34:22 35:1 63:13  
65:10 183:1 280:2  
438:3 495:7  
**perspectives** 8:16  
26:16 65:6  
**pertaining** 6:8 484:11  
**pertains** 51:11 132:3  
**Peru** 471:1  
**pest** 308:11 340:22  
342:8 343:9 345:3  
452:9  
**pesticidal** 45:17 301:8  
**pesticide** 16:5 124:10  
467:10 468:16  
**pesticide-free** 458:19  
**pesticides** 2:16 3:11  
10:4 40:9 42:9 45:7  
53:17 73:21 124:11  
154:8 173:9 205:10  
352:1 446:17 457:5  
465:19 468:3 482:19  
**pet** 232:3  
**Petaluma** 252:13  
**Peter** 211:13 214:1  
**petition** 95:11 97:1,2  
100:15,21 104:15  
152:14 154:22 226:14  
248:17 260:21 292:3  
293:5 296:7 298:8  
299:4 300:2,6,16  
301:5,7 313:14  
316:13 342:4 374:3,9  
374:10,12,13,15  
380:21 381:2 383:6  
385:13 388:15 389:6  
390:12 395:21 396:7  
399:8,20,22 400:2,4,6  
400:13,18 401:2,7  
403:2 404:22 405:8  
405:12  
**petition's** 97:3,4  
**petitioned** 4:18 41:17  
116:20 260:11,13,17  
299:6 396:20 398:2  
400:3 406:21 412:14  
**petitioner** 291:12 300:9  
300:22 301:4 375:10  
376:11 377:13 378:3  
381:19 395:5 396:8  
402:8,18  
**petitions** 95:6 301:7  
373:22 408:10  
**petroleum** 278:2,5  
**pH** 164:8 168:22 169:9  
169:12,16 172:14  
180:19 181:3 183:14  
183:17 194:10  
**Ph.D** 2:2,3,5 481:22  
**phase** 171:15  
**Phil** 3:4 56:21,21 67:11  
67:12,14 70:12,14  
74:17,19,19,19,19  
77:2 80:18 316:12  
**Phillip** 87:16  
**philosophical** 11:6  
83:11  
**philosophy** 26:15 138:4  
**phone** 252:20 377:8  
**phones** 7:16  
**phonetic** 244:18 513:6  
**phosphate** 159:10  
161:1 163:2,9,19  
164:3,4,8,11,15,19  
165:1 167:2 168:14  
169:10,13,16,20  
171:22  
**phosphate's** 194:18  
**phosphates** 159:10,12  
159:18,19 160:4,9,13  
160:15,15,20 161:3,6  
161:6,18,20 162:18  
165:16,22 166:7  
167:22 168:5,10,12  
168:16,21 169:4,18  
170:11,14,15,18  
171:9 172:12,14  
193:12,14,17,20  
194:14 195:12,14  
**phosphoric** 231:4  
**phosphorus** 159:22  
160:13 161:7,8,9  
**photographs** 143:20  
486:17  
**photography** 135:7  
**photos** 314:10,10  
**photosynthesizer**  
449:1  
**photosynthesizers**  
448:20  
**phrase** 425:15  
**phylogenetically**  
275:20  
**physical** 389:8  
**physically** 22:18 448:9  
**phytochemical** 499:4  
**pick** 234:11 337:12  
515:19  
**picking** 191:14 491:11  
**picture** 203:17 275:6  
280:16 503:3  
**pictures** 203:14 449:10  
506:19  
**pie** 438:4,7 439:4,5  
**piece** 91:3 216:19  
255:12 319:11 485:18  
**pieces** 239:7  
**Pierce** 3:9 221:1 225:4  
225:6,7 229:11,14  
231:6  
**pigs** 309:10  
**pineapple** 387:1 388:3  
388:5 389:3  
**pinkeye** 251:22 252:3,9  
253:6  
**pioneers** 476:8  
**pit** 402:1  
**pitting** 83:12 118:3  
**place** 17:17 41:13 93:20  
96:1 123:22 129:6  
132:17 136:5 137:22  
157:3 185:17 202:20  
207:9 219:7 235:3  
266:21 284:7 314:22  
315:8 336:11 339:3  
383:12 409:13 447:6

480:18 482:22 509:20  
521:1  
**placed** 23:22 414:1  
**places** 86:13 108:11  
286:22 293:1 413:20  
414:5 457:19 464:19  
**plan** 89:15 217:8 453:5  
465:3,6,12 468:1  
469:8  
**planet** 174:15 200:17  
464:21 500:1  
**planning** 427:17 466:1  
468:8 470:2  
**plant** 11:5 19:3 22:12  
24:18 25:4,5,7 110:11  
123:7 136:15 166:12  
173:13 176:9,13,15  
191:1 205:10 223:17  
243:12 347:4 351:10  
354:8 355:10 356:3  
358:3 360:22 382:9  
383:11,13 388:6  
401:8 405:1 410:11  
411:7 414:21 415:4,7  
415:9 432:12,12,20  
437:1 440:1,10,15  
452:14,16 458:5  
464:20 467:14 484:1  
487:16 498:13,15  
501:15,16 531:11,12  
532:15,19  
**plant's** 433:16,18 435:1  
441:5,7 537:21 538:1  
539:20,22 540:7,9  
**plant-based** 411:1  
**planted** 59:13 71:1  
271:3 421:15 433:20  
434:8 435:4 441:8  
503:7 538:3 540:2,11  
**planting** 103:19 431:5,6  
**plantings** 288:16  
**plants** 10:10,17,20 19:7  
21:2 23:4 25:2 36:18  
36:22 65:21 95:2  
135:5 173:17 174:9  
174:10 177:14 189:1  
189:2,7 206:6,12  
207:4 317:9,16,18  
364:18 375:15 394:13  
394:20 428:12 432:21  
433:2,3 434:2,8  
441:14 445:7 448:20  
450:2,10,20 458:21  
478:8,21 485:22  
501:12 503:17 532:16  
532:19 537:14 538:7  
540:16  
**plants'** 206:5

**plastic** 173:17 289:8  
331:22 337:12 537:17  
**plastics** 466:19  
**platform** 505:19  
**play** 76:20 78:19 111:4  
130:11 481:6 485:11  
**playing** 76:3 393:21  
448:10  
**plays** 181:19  
**Pleasant** 243:10  
**please** 5:19 6:19 7:11  
19:21 57:21 83:6  
102:17 154:14 155:4  
162:22 191:6 196:5  
203:7 233:13,22  
259:20 262:16,20  
273:4 282:7 312:3,4  
391:20 419:19,21  
442:18 463:7 474:12  
**pleased** 109:22 121:22  
145:1 482:15  
**pleasure** 240:15  
**plenty** 140:11 365:18  
**plug-flow** 401:9 402:12  
405:3  
**plums** 503:4  
**plus** 19:2 33:17 233:10  
303:15 506:14  
**pockets** 188:20  
**poem** 319:7  
**point** 31:8 62:7,12,13  
92:9 122:4 145:18  
146:3 157:21 160:2,9  
213:7 221:19 223:5  
226:6 243:9 246:7  
266:14 294:21 295:15  
297:6,16 299:13,13  
299:21 301:22 324:19  
345:10 352:9 391:16  
392:2 393:11,14  
412:2 420:4 460:12  
473:17,21 484:17  
489:8,9 492:1 495:11  
502:20 505:9 509:15  
511:18  
**pointed** 22:10 410:18  
472:17 482:9  
**pointing** 200:12  
**points** 132:1 221:17  
266:2 294:8 425:7  
486:9 487:13 507:22  
**poisonous** 154:13  
**policies** 54:19 111:2  
136:12 137:5  
**policy** 5:13,13 49:22  
57:3 81:4 137:3 158:4  
270:3  
**pollinator** 465:11

**pollute** 68:20  
**Poly** 286:21  
**polyethylene** 280:12  
**polymer** 274:1,3,7  
276:2,19 280:7  
**polymeric** 273:17  
**polymers** 273:13,22  
279:20  
**polysaccharide** 179:19  
**pomace** 177:18  
**pome** 270:16  
**ponds** 466:22  
**ponic** 117:7,19 456:17  
**pool** 130:15 226:9  
439:16  
**popular** 113:9 168:19  
522:17  
**population** 161:11,21  
284:17  
**populations** 140:18  
161:13  
**porous** 437:17 450:3  
**portion** 120:22 197:3  
320:14 438:9 439:8  
491:21  
**portray** 134:15  
**portrays** 425:11  
**ports** 211:11 218:12  
268:12  
**pose** 271:8  
**posed** 94:16 263:5  
**poses** 108:15  
**position** 19:14 81:6,7  
81:10,13 84:8 100:17  
107:1 118:8,15  
152:20 153:1,5  
246:15 258:20 259:8  
283:11 285:11 463:16  
474:9 482:5 494:16  
512:13 514:8 515:8  
532:13  
**positions** 518:21  
**positive** 63:10 144:8  
235:19 296:3 482:20  
489:5 499:7  
**possibility** 37:14 157:6  
157:9 337:4 381:8  
395:4 519:18 524:2  
526:15  
**possible** 6:22 7:3,11  
10:19 20:15 34:19  
44:8 74:4 93:21  
106:16 124:13 190:5  
266:7 280:6 281:3  
293:6 425:19 444:14  
480:8 489:12,15  
524:14  
**possibly** 258:17,19

308:2 336:22 337:20  
338:15  
**post** 55:20 211:7,14  
246:21 318:12  
**post-emergence**  
223:14  
**posted** 314:8 374:14  
**pot** 59:12 61:16 439:17  
**potassium** 102:4  
196:18 197:22 198:10  
198:13 222:2,10  
256:12  
**potential** 75:5 98:17  
139:17 186:11 236:2  
257:21 266:21 272:4  
311:14 329:19 352:4  
406:16 408:9 486:6  
507:14 524:8  
**potentially** 114:22  
329:16 365:1 392:5  
**pots** 288:18,19 289:11  
537:16  
**poultry** 3:9 150:7,19  
151:17,18,19 152:4  
225:8,18 226:20  
228:14 230:8,13  
**pound** 496:21,22  
497:12,16  
**pounds** 173:21 174:1  
276:9 305:18,19,21  
306:2,4 310:20  
435:14,15 436:4,5  
437:7 439:15 497:1  
497:11,15  
**pour** 437:19  
**poured** 459:16  
**powder** 168:17 341:8  
342:2  
**powdered** 166:20  
194:22 342:14  
**powders** 159:15 163:18  
**power** 75:20 202:15  
258:20 504:21  
**PowerPoint** 427:12  
**practical** 37:19 116:6,7  
143:8 389:18  
**practice** 54:2 58:11  
66:19 226:20 233:3,4  
288:17 328:20 417:11  
447:10 492:5,7  
**practices** 18:21 33:9  
58:13,14 66:20 82:13  
108:19 113:3,19  
117:11 131:14,18  
146:12 150:7 226:18  
228:2 238:11,18  
267:11,11 333:15  
348:13 406:5,20

- 430:14 445:15 451:22  
467:13 473:14,18  
482:17 524:8  
**practitioners** 372:2  
**pre-harvest** 223:19  
321:15 403:10 406:14  
406:22  
**preamble** 91:8 123:17  
125:13  
**precautionary** 500:13  
**precedent** 413:22  
517:22  
**preceding** 290:4  
**precludes** 523:3  
**predators** 449:1,5  
501:11  
**predatory** 449:5  
**prefer** 133:3 165:1  
283:21 530:12  
**preference** 163:6 463:4  
463:6 477:11,13  
**preferences** 160:22  
163:4  
**prejudiced** 383:10  
**premise** 361:11  
**premium** 96:9 214:10  
**premiums** 57:16  
**prepare** 460:1  
**prepared** 294:5 295:9  
**preparing** 151:22  
**preps** 183:21  
**prescribed** 190:1  
**prescribing** 50:19  
52:17  
**prescriptive** 81:16  
**presence** 59:3 166:17  
271:7 411:7 422:20  
**present** 1:11 2:1,7 3:1  
40:11 167:11 177:14  
180:13 181:21 442:2  
497:14  
**presentation** 6:2  
179:13 303:4 521:12  
**presented** 185:12  
212:20 235:6 279:9  
336:16 484:16  
**presenters** 288:9  
**presenting** 116:12  
494:14  
**presents** 117:7 164:4  
**preservation** 205:8  
**preserved** 38:15  
**preserves** 180:3  
**President** 225:7 254:3  
**presiding** 1:10  
**press** 316:10 414:6  
**pressing** 185:19  
**pressure** 132:14 247:21  
**pretty** 16:21 72:8 80:11  
80:13 143:8 145:21  
180:22 213:9 229:8  
232:5 288:22 309:1  
333:6,6 358:16 439:7  
439:16 470:14 478:2  
478:22 480:13,19  
481:7 482:1 505:17  
512:2 519:6 521:6  
523:21  
**prevalent** 151:9  
**prevent** 144:14 166:11  
537:14  
**preventing** 41:21  
118:22 143:10  
**prevention** 108:16  
150:3  
**prevents** 345:15  
**previous** 32:17 54:20  
108:8,18 159:17  
185:6 191:2 225:17  
290:10 345:10 358:17  
371:7 450:14 488:8  
**previously** 64:20  
161:15 251:21 365:2  
375:2 443:16  
**price** 96:9 213:18  
214:13 216:17  
**priced** 216:17  
**prices** 216:5  
**primarily** 8:5 12:17 13:2  
16:4,10 28:20 77:5  
97:14 286:18 484:3  
**primary** 162:2 404:4  
**principal** 404:10 500:14  
**principle** 18:20 123:13  
134:11 447:9  
**principles** 50:17 110:8  
118:13 285:18 382:15  
383:20 458:3 480:1  
481:2 488:16 508:10  
508:10  
**print** 173:13  
**prior** 117:6 156:8 443:9  
446:1 449:17  
**priorities** 491:10  
**priority** 64:12,15 105:5  
151:4,16  
**privately** 239:15  
**privilege** 391:17  
**privileged** 284:2  
**Prize** 497:22  
**pro** 429:13  
**pro-hydroponic** 443:14  
512:21  
**pro-soil** 506:17 511:2  
**probable** 524:15  
**probably** 7:8 23:11  
29:19 31:21 32:18  
53:6 67:19 72:3 74:13  
78:16 87:20 88:10  
144:10 145:21 231:2  
232:5 239:14 262:5  
269:5 299:17 307:14  
379:16 384:9 387:2  
399:10 408:3,5  
434:14 464:3 491:10  
504:11 520:10 522:10  
522:17  
**problem** 13:20 30:14  
108:21 122:18 188:15  
215:4 219:19 230:21  
306:20 307:10 309:12  
310:19 311:4 314:1  
318:9,16 435:22  
436:21 440:6 458:11  
494:2,9 509:17  
521:17  
**problematic** 355:21  
**problems** 35:14 45:20  
122:5 123:1 333:4  
369:13 486:1  
**procedural** 383:2  
**procedures** 5:14 54:19  
119:5 122:2 207:8,19  
**proceed** 228:9 282:4  
399:19 404:1 529:17  
530:1 534:13,17  
535:19 537:6 539:10  
**proceeding** 48:8  
199:12 542:3  
**process** 25:18,22 33:18  
37:18 38:14 42:12  
45:15,16,21 46:2 47:7  
48:18 54:1,11 55:1,7  
55:12,16 82:19 93:19  
103:2 109:6 122:12  
122:17 191:7 206:12  
206:22 215:15 222:16  
226:3 258:5,13,15,18  
259:11 260:8,9 261:3  
261:4,8 262:19 263:6  
263:9 264:8,11,14  
273:12,15 289:4  
310:12 328:20 352:2  
380:14 385:2,4  
402:21 403:7 404:14  
404:17 405:4,21  
406:1 409:21,22  
413:8,12 417:13  
428:14 429:6 440:16  
**processed** 125:3  
129:12 163:7,15  
193:18 194:1,11,16  
194:22,22 195:8,15  
195:18 402:14 405:2  
412:20 413:2 417:15  
450:6 520:15  
**processes** 207:6,19  
228:19 280:21 403:9  
410:20  
**processing** 166:12,13  
166:15,16 167:4,7  
178:4 341:14 354:22  
402:2 410:15  
**processor** 68:12 77:6  
186:3 187:8  
**processors** 166:10  
521:2  
**produce** 2:14 10:3  
28:18 46:10 64:5  
95:19 96:7 98:1  
116:14 117:13 118:4  
119:12 177:9 179:4  
182:10 184:2 186:6  
195:2,7 205:17 206:2  
209:7,11,19 212:13  
228:4 237:13 305:22  
309:14 316:2 403:14  
445:12 457:15 491:21  
492:2,4 496:18  
498:19  
**produced** 32:22 34:12  
36:20 64:4 96:4 110:7  
122:6 155:22 179:3  
188:19,22 194:16  
198:10 214:15 254:9  
254:14 284:10 328:19  
328:20 335:15 339:9  
339:10 401:4,18  
402:4 405:3 416:2  
450:18 472:15 520:18  
520:20  
**producer** 30:5 50:3  
77:18 84:22 100:2  
116:13 182:9 302:17  
414:20 451:5,13,19  
**producers** 2:8 17:11  
41:15 43:5 59:17 81:5  
81:19 95:1 98:10,11  
98:14,17 103:21  
108:13,13 110:12  
112:6,7 131:22 132:3  
132:5,14 138:20  
140:4 148:18 177:5  
182:15 189:3,5  
195:17 214:10,11,22  
215:16 216:8,11  
253:13 292:13,21  
293:16 294:7 303:7  
303:11 337:10 355:22  
406:4 424:15 444:5,6  
446:4 453:16 505:14  
**produces** 178:6 402:13

469:21 496:22  
**producing** 66:4 178:20  
 185:15 195:6 209:20  
 413:16 447:17  
**product** 37:19 56:11  
 61:15 161:2 164:19  
 166:18 167:8,9,11,12  
 167:13 170:1 171:13  
 171:14,21 172:7  
 175:3 180:8,21 182:9  
 183:6,15,19 184:2,4  
 184:18 186:9 194:7  
 194:16 195:5,19  
 197:7,10 206:10  
 207:20 224:9 235:11  
 248:22 249:14 278:3  
 278:16,19 296:1,4,12  
 296:16 310:2 318:21  
 329:20 331:13 336:8  
 336:13,16 337:5,7  
 338:8,9 339:1 347:6  
 362:5 371:9,14 372:8  
 381:20 409:4,20  
 411:4 414:1 474:4,6  
 492:7 508:16 520:17  
 521:2  
**productions** 286:14  
 366:7  
**productive** 508:11  
**products** 2:9,19 4:13  
 69:8 100:5,19 101:8  
 101:18,19 102:5,7,15  
 105:1,2,7 106:8  
 120:14 122:7 124:10  
 126:11 128:17 133:18  
 134:3 159:7,14 162:7  
 162:9,15 163:9,10,15  
 164:5 165:4,7,18  
 166:22,22 167:1  
 168:20 169:2 170:4,8  
 171:7 172:3 180:3,17  
 181:6,9,10,13 182:13  
 182:16,19,20,22  
 183:9,18,21 184:3,12  
 184:20 190:22 191:4  
 193:15,17 194:1,2,4  
 195:3,8,21 196:12  
 202:18 221:6,13  
 222:19 271:4 272:19  
 285:9 321:20 323:19  
 337:20 354:5,14  
 356:15 362:16 363:16  
 401:9 410:20 417:15  
 444:10 457:1 491:15  
 491:17  
**professional** 248:16  
 312:20  
**proficient** 287:6

**profile** 226:6 311:4  
**profit** 39:10  
**profits** 461:20  
**profound** 37:12  
**program** 2:2,3,4,5,6  
 15:11 36:10 40:20,22  
 41:12 46:5,6,9 100:10  
 129:1 138:19 150:14  
 153:12,13 158:1,4,9  
 189:18 225:20 226:2  
 227:20,22 232:21  
 233:6 242:2,4,6  
 257:21 258:3 263:5  
 264:10,15 265:1,2  
 270:8 278:12 374:11  
 400:3 411:22 412:5  
 506:6  
**program's** 396:2  
**programs** 262:19 320:4  
**progress** 52:18 114:1  
 131:16  
**progressing** 138:5  
**prohibit** 19:22 58:8  
 66:15 103:7 105:15  
 107:10 317:4 432:16  
 433:9 488:11 492:5  
 529:3 530:21 531:7  
 533:1,6,17 534:2,22  
 535:5 536:1,4,6  
**prohibited** 33:9 66:19  
 104:13 107:5 190:3  
 368:15,21 369:6,8,18  
 369:22 370:1 371:10  
 371:16 372:5,11,18  
 372:22 407:18 414:22  
 450:17  
**prohibiting** 60:10 61:3  
 106:18 316:8  
**prohibition** 42:3 58:5  
**prohibitive** 336:20  
**project** 210:21 308:9  
**projects** 112:10,13  
**proliferation** 447:12  
**prominent** 15:17  
**promise** 273:11 316:2  
**promote** 140:14 364:17  
 457:22 509:19  
**promotes** 194:8  
**promotion** 147:17  
**promptly** 282:8  
**prone** 9:21 114:21  
 486:1  
**propagate** 446:5  
**proper** 222:17,18  
 267:22 447:12 484:4  
**properly** 35:16 405:2  
 447:15,16  
**properties** 164:4

170:22 178:2 180:1  
 185:3 187:5,10 194:4  
 194:18 195:14  
**proponent** 246:3  
**proponents** 117:18  
 443:14  
**proposals** 19:22 25:20  
 108:3 109:16 162:17  
 189:20 196:14 255:1  
 432:9 530:13  
**propose** 61:19 81:14  
 116:2 541:18  
**proposed** 80:2 82:22  
 94:10 101:4 104:2  
 125:15,16 130:20  
 143:7 151:4 192:8  
 198:19 257:8 259:10  
 261:4 264:15 283:9  
 336:22 355:12 472:21  
 472:22 522:15 524:5  
**proposes** 375:10  
 402:18  
**proposing** 84:21  
 119:15 148:7  
**proprietary** 39:10 175:9  
**protect** 38:18 41:14  
 68:12 72:18 233:17  
 364:18 514:17 521:4  
**protecting** 54:10 108:9  
 465:9 493:1,2 514:7  
 514:19  
**protection** 179:22  
 181:5,17 219:17  
 458:20 466:11,15  
 513:11,21  
**protective** 56:15  
**protein** 148:13 167:1  
 168:18 169:2 171:14  
 179:21 181:5,17,18  
 258:9 260:22 262:2  
**proteins** 194:5,8,20  
 206:14  
**protocols** 205:22  
 252:22  
**protozoa** 431:19 438:10  
 447:14  
**proud** 68:10 208:2  
 209:6 214:22  
**prove** 249:4 250:8  
 311:11 413:14 415:10  
 435:19  
**proven** 251:4  
**provide** 5:16 9:20 23:15  
 26:4,10 44:9 49:4,5  
 94:20 115:8,18  
 116:17 117:17 118:13  
 119:11 123:6 133:19  
 140:9 145:16 152:8

166:17 168:21 169:18  
 170:19,22 177:6  
 179:21 180:17 186:8  
 211:9 214:9 234:8  
 239:5,17 268:10  
 285:16 363:9 376:21  
 430:2 452:9 473:9,17  
 510:4  
**provided** 20:16 42:17  
 196:1 198:21 347:7  
 363:11 421:11 461:13  
**providers** 196:10  
**provides** 38:2 118:1  
 128:3 164:17 179:17  
 181:13,16 225:10  
 362:1 481:10  
**providing** 94:2 117:16  
 118:20 171:19 284:19  
 318:14 435:19 453:20  
 456:20 465:13 503:10  
**provision** 232:14  
**provisions** 33:1 34:12  
 34:17 156:1 472:15  
 484:2  
**proxies** 6:12  
**pruning** 272:2 288:12  
 394:2  
**prunings** 288:14  
**pseudomonas** 250:15  
**psychologists** 134:5  
**public** 4:1,21 5:4,7,10  
 5:12 7:1,2,14 38:14  
 44:7,9 48:2,2,4,5,12  
 48:14 54:8 55:1 56:12  
 137:8 225:19 242:18  
 260:4 268:18 281:19  
 283:14 292:5 294:18  
 294:19,20 295:7  
 315:15 320:13 336:12  
 336:17 340:12,15  
 341:11 342:6 347:21  
 354:19 363:10 364:20  
 371:6,8 376:14  
 377:14 379:18 380:1  
 388:14 400:14 403:19  
 410:10 412:8,11  
 419:18,21 420:20  
 430:2 442:3 443:11  
 446:11 448:3 454:10  
 455:16,18,19 470:16  
 487:9 503:2 511:1  
 523:6 525:4,12 526:7  
 526:13  
**publication** 306:16  
**publications** 113:10  
**publish** 113:18  
**published** 159:18  
 161:21 496:9,11

498:18  
**Puertas** 2:8 36:3,9  
**Puerto** 485:8  
**pull** 5:7 308:3 530:8,14  
 530:15  
**pulled** 299:1 431:14  
**pullet** 225:11  
**pulling** 64:22  
**pulls** 5:9  
**pulse** 56:1,1  
**pun** 233:16,20  
**purchase** 491:17  
 504:20 505:4  
**purchased** 458:6  
**purchasing** 96:4,6  
 491:15  
**pure** 280:4  
**purely** 388:8 487:21  
**purgatives** 160:5  
**purity** 108:9 257:10  
 422:15,22  
**purpose** 127:20 128:1  
 128:12 129:2 289:1  
 473:13  
**purposes** 272:16  
 539:17  
**pursue** 89:21 104:20  
 208:7  
**purview** 408:6 412:2,13  
**push** 95:11 399:15,16  
**pushed** 295:10,11  
**put** 14:13 15:10,16  
 17:12,17 30:2 41:8  
 69:5 70:6 89:6 93:20  
 96:20 135:12 157:2,5  
 186:3 195:10 196:9  
 208:17 210:1 246:21  
 248:2 254:7 259:8,11  
 264:16 276:8 277:8  
 278:9 280:22 281:17  
 287:8 291:4 313:7  
 318:20 323:16 330:11  
 337:12 338:16 387:10  
 392:18 408:19 414:9  
 428:18 429:7 436:15  
 436:18,20 437:7  
 439:20 442:22 454:17  
 465:3,10 470:10  
 476:10 482:5 487:3,9  
 489:11 496:19 506:20  
 509:16 512:8,12,14  
 517:14 518:21 532:13  
**putting** 22:11 55:21  
 111:13 260:5 290:5  
 331:13 384:3 440:14  
**puzzles** 297:11,14  
**pyramid** 127:8

## Q

**Q&A** 240:19  
**QAI** 3:12 196:6,10,19  
**QCS** 240:16  
**qualified** 74:8  
**qualifier** 94:19  
**quality** 3:7 51:4 178:10  
 206:1 207:13 221:4  
 227:19 234:12 240:10  
 295:22 296:2,4  
 392:22 422:1 433:3  
 439:21 465:9 466:11  
 532:20  
**quandary** 279:11  
**quantities** 345:4 409:8  
**quantity** 162:11 178:10  
 422:2  
**quarter** 512:6  
**quarter-million** 512:6  
**question** 6:22 8:12 12:7  
 13:6 15:22 18:3 21:20  
 29:15 32:14,19 33:18  
 35:5 43:12,21 45:4  
 50:13 62:1 64:19 73:6  
 74:18 79:11 84:8,10  
 88:2 89:8 91:17 96:19  
 97:3,6 111:11 114:3  
 124:18 128:19 146:9  
 165:2,15,20 166:6  
 167:4 172:10 175:4  
 187:21 197:5 208:22  
 216:8,21 234:17  
 236:13 237:11 238:16  
 239:8,21 244:4,8  
 246:11 252:12 257:15  
 260:2 261:6 262:13  
 263:5 265:7 269:5  
 273:22 274:19 275:14  
 276:6 280:6 288:3  
 289:15 300:21 305:13  
 309:3 310:11 312:15  
 313:11 333:11 365:6  
 386:15 390:2 407:17  
 454:11 455:17 524:21  
 525:1,3 529:6,10,11  
 529:16 530:6,6 533:8  
 533:12  
**questioning** 203:16  
**questions** 6:1,10,20  
 7:10,11 11:14 17:7,8  
 39:20 49:12 64:7 77:3  
 86:19 96:16 119:19  
 124:15 128:22 129:4  
 139:22 140:1,5  
 149:16 152:2 153:21  
 153:22 156:21 171:2  
 174:16 192:20 203:19  
 213:4 229:5 252:10

253:20 254:21 257:13  
 257:14 267:1 269:15  
 273:1 281:18 285:22  
 287:18,22 293:21  
 294:13 315:11 319:5  
 323:18 336:4,6 338:2  
 338:13,22 342:12  
 343:4 345:17 348:17  
 356:7 362:14 363:18  
 363:20 364:16 369:9  
 372:14 400:21 422:18  
 441:18 455:13 464:4  
**quick** 5:10,11 110:14  
 111:11 114:3 165:15  
 252:11 305:16 363:22  
 377:3 413:6 517:7  
 533:15  
**quickly** 124:13 199:8  
 254:18 438:13,21  
 451:4 517:13  
**quiet** 419:17  
**Quinn** 243:14 244:20  
**quite** 81:5 84:18 112:3  
 136:3 180:19 206:12  
 238:3 248:19 278:17  
 287:6 300:8 306:18  
 306:19 307:19 308:5  
 310:15 392:21 393:4  
 435:17 439:9 471:6  
 471:12 476:18 478:3  
 515:1  
**quo** 517:5  
**quorum** 419:11  
**quote** 151:6 155:20  
 157:22 158:3 361:20  
 404:10 429:13  
**quoted** 428:11

---

**R**

---

**radar** 220:7 388:17  
**radical** 83:13  
**RAFI** 243:10  
**rain** 38:2 88:16  
**rainforest** 56:15  
**rainwater** 202:15  
**raise** 203:9 304:4  
 387:18,18 474:21  
**raised** 200:13 201:18  
 202:17 237:13 351:22  
 387:13 474:20 525:12  
 525:19  
**raising** 86:3 94:4  
**rampant** 216:4  
**ran** 21:12 69:10 73:18  
**ranchers** 3:14 94:2  
 302:16  
**range** 81:11 88:7 90:19  
 169:12 182:9,13  
 184:19 195:20 210:16  
 253:5 277:12 290:20  
 344:22 405:14 406:5  
 407:12 438:11,19  
 460:14 517:12  
**ranges** 497:14  
**Rankin** 3:10 153:20  
 158:22 159:1,1,3  
 163:8,21 165:9,19  
 166:1,15 167:10  
**rapidly** 94:22 98:6  
 394:10  
**rare** 229:8 232:18  
**rarely** 63:9 243:22  
**raspberries** 288:13  
**rate** 136:2 150:22  
 224:22 304:17 305:11  
 305:20 311:3  
**rates** 150:20  
**ratio** 11:2 276:22  
 277:14  
**raw** 104:18 174:2  
 177:16,19,19 178:3,9  
 178:22 179:2,6 186:7  
 401:11 402:6,9  
 405:10 406:14 409:12  
 417:13  
**re-** 101:15  
**re-list** 159:9 162:5,17  
**re-listed** 101:4 257:1  
 258:3  
**re-listing** 116:22 162:13  
 162:19  
**re-looking** 112:1  
**re-petitioned** 395:22  
**re-reviewed** 364:3  
**re-use** 238:18  
**re-used** 238:11  
**re-wrote** 211:6  
**reach** 140:3 259:2,6  
 284:17 497:10 524:13  
 528:15  
**reached** 14:11 261:8  
**reaching** 258:16 259:4  
 421:17  
**reaction** 251:3 499:5  
**read** 27:12 47:5 48:4  
 70:6 71:15 77:9 79:12  
 157:1,7 189:21 202:9  
 235:16 238:2 321:5  
 324:8,11 341:22  
 399:7 423:21 442:18  
 471:14 476:20 483:13  
 484:15 485:10 530:16  
 532:12 535:21,22  
 537:10  
**reader** 49:1  
**readily** 306:19

- reading** 48:5,17 319:15  
329:22 476:2 486:22  
508:22
- reads** 48:2 417:14  
530:10 537:19
- ready** 285:9 296:18  
334:4 339:6 343:5  
352:21 364:7 366:3  
369:16 372:15 380:7  
385:6 386:12 396:12  
425:22 478:16 530:7  
537:2
- real** 84:10 92:10 94:17  
95:7 96:4 99:3 115:6  
320:5 330:2 386:13  
517:13 534:18
- realistic** 421:19
- realities** 499:16
- reality** 116:6 508:8
- realize** 71:5 318:4  
463:13 501:5
- realized** 515:20
- realizing** 289:10
- realtor** 80:8
- realtors** 80:9
- rearrangement** 41:3
- reason** 55:18 116:2  
190:4 215:5 266:9  
330:2 352:8 361:9  
380:19 382:1 392:18  
402:22 423:3 434:9  
436:18 437:13
- reasonable** 57:22  
113:21 131:16 211:9  
383:4 528:21
- reasonably** 383:5
- reasoning** 386:18
- reasons** 24:4,7,7  
168:10 255:14 283:11  
289:12 329:15 412:10  
422:9 444:8 458:8  
482:7 483:3 491:15  
493:13 511:6
- recalcitrant** 438:15
- recall** 469:22
- recapitulate** 221:17
- receive** 155:7 249:11
- received** 43:22 166:9  
224:20 259:7,21  
298:8 306:9 400:2  
422:11 448:5 492:1
- receiving** 96:10
- receptivity** 150:18
- recess** 541:22 542:5
- recirculated** 433:5  
532:21
- recirculates** 202:16
- recirculating** 2:15
- 173:11 200:6 432:19  
532:14
- reclaimed** 401:12
- reclassification** 196:18
- recognition** 37:12  
331:4 521:10
- recognizable** 180:7
- recognize** 9:18,22  
26:17 54:22 63:8 82:5  
89:19 102:16 117:5  
192:12 232:9 479:11  
506:3
- recognized** 140:15
- recognizes** 92:16
- recollection** 300:22
- recommend** 112:20  
178:14 236:7 324:4  
433:14
- recommendation** 38:14  
58:8 59:18 61:2 65:20  
91:6,8,9,21 106:2  
109:14 123:10 124:8  
148:12 198:8 201:22  
217:19 234:22 241:8  
283:10 365:15 428:10  
429:21,22 430:18  
434:4 445:6,12 447:5  
449:19 454:2 459:3  
472:12 489:10 517:8  
534:9 535:13
- recommendations** 38:9  
38:11 55:14 58:17  
60:9 91:15 118:19  
122:1,3 150:13,18  
196:22 212:18 257:20  
429:14 430:9,10  
445:14 517:11
- recommended** 42:12  
45:21 337:16 341:15  
341:21 355:12
- recommending** 93:17  
361:7
- recommends** 61:3  
268:8
- reconcile** 13:17
- reconsider** 82:21  
378:20
- reconsideration** 396:7
- record** 6:6 8:1 18:9 36:1  
40:6 49:19 81:2 93:12  
99:9 177:2 248:12  
260:6 273:5 282:11  
282:19 283:8 301:3  
321:6 353:2 419:7  
463:19 529:14 542:7
- recordkeeping** 421:8
- records** 143:21 264:19
- recovered** 36:20
- recreate** 500:19
- rectify** 33:12
- recuse** 350:1
- recyclability** 454:3
- recycle** 239:1 288:20  
289:1,2 453:16
- recycled** 238:12 279:22  
287:20 452:19
- recycling** 51:7 238:19  
452:6,16 467:14  
478:19 527:19
- red** 5:18 230:7,15,16  
275:9 314:11
- redesign** 502:1,6
- redirecting** 108:16
- redlined** 445:10 449:18
- redress** 316:13
- reduce** 195:16 202:19  
252:7 272:4 319:11  
319:13 406:1 417:15
- reduced** 488:1
- reduces** 490:7
- reducing** 271:7,17  
405:21 446:17
- reduction** 227:20  
249:10,12 252:4  
403:7 405:1 511:13
- reductionism** 518:8
- refer** 385:12,15 423:9  
426:2
- reference** 156:13 160:3  
193:1 362:1 435:5  
473:17
- references** 145:1 190:9  
483:11,16,18 484:7,9
- referencing** 145:17
- referred** 10:16 242:22  
483:8,19
- referring** 422:21
- refine** 83:4 93:1
- refined** 206:22
- refinement** 428:16
- refinements** 41:2
- refining** 40:21 109:6  
206:19
- reflect** 213:21 446:3  
510:15
- reflected** 519:6
- reflection** 442:20 443:1
- reflective** 413:9 455:4
- reflects** 489:17 507:4  
519:3
- reformulated** 364:2
- reformulation** 365:19
- refrain** 6:13,17
- refrigerate** 202:18
- regard** 128:12 145:4  
151:7 444:19
- regarding** 20:7 43:12  
155:12 159:17 161:18  
197:21 205:16 317:1  
341:12 342:4 403:2  
420:4 443:6
- regardless** 9:10 17:17  
60:12 383:6
- regards** 16:3,6 65:1  
96:20 111:11 158:5  
165:16 236:14 312:13  
407:8,19 408:11  
445:8 450:5
- regenerate** 105:15
- regeneration** 144:22
- regenerative** 56:13  
143:10
- region** 138:21 210:22  
212:11 272:7 369:12  
392:20 393:5 462:7
- regional** 78:18
- regionally** 422:3
- regions** 106:18 230:5  
445:21
- Register** 264:18 265:3
- registered** 363:16
- regroup** 525:15
- regulate** 80:4 156:2  
504:3
- regulated** 124:3 316:8  
445:19 515:13
- regulation** 30:22 58:18  
111:13 115:7 192:8  
197:1 245:17 355:18  
394:12 409:19 410:4  
410:8 411:21 445:8  
464:11,14,17 469:7  
470:7 471:2,13 481:2  
486:12 494:19 514:17  
520:13
- regulations** 40:19  
89:11 91:12 103:11  
104:3,9 122:16 136:5  
151:6 156:9 192:10  
192:15 371:17 400:5  
405:5,16 411:22  
449:16 457:19 458:14  
471:19 483:13 484:7  
484:10 485:2 494:11
- regulations.gov** 378:2
- regulator** 375:17,21  
382:10 386:19 394:9  
394:10,19
- regulators** 386:20
- regulatory** 93:19 110:5  
116:2 119:16 130:13  
130:20 133:16 134:1  
143:7 159:12 170:17  
192:12 254:4 255:5,6

255:17 268:16 270:2  
**reincorporate** 289:13  
**reinoculation** 452:9  
**Reiter** 3:11 283:3,8,20  
**reiterate** 159:16 161:4  
 297:10  
**reiterates** 412:1  
**reiterating** 294:21  
 411:13 413:11  
**reject** 416:9 533:7  
 536:5,6 538:12  
 540:20  
**rejected** 383:6  
**rejecting** 531:8  
**rejection** 524:16  
**relate** 59:9  
**related** 19:3 134:8  
 143:17 151:15 154:1  
 160:4 238:17 266:19  
 267:1,12 269:6  
 275:20 288:4 351:18  
 388:4 441:1 488:14  
**relates** 62:22 402:5  
**relation** 389:3  
**relations** 211:4  
**relationship** 210:10  
 477:4  
**relationships** 10:9  
 140:17 287:3 447:18  
**relative** 144:18 190:17  
 230:7 276:15 323:13  
 513:12  
**relatively** 128:13 181:1  
 186:21 344:20 453:9  
**release** 22:10,13,16  
 23:13,15 438:20  
 439:1 497:11,18  
 501:9,10  
**released** 22:19 311:16  
 497:16  
**releasing** 497:1  
**relegating** 216:10  
**relevant** 6:7 160:7  
 277:4 303:3 485:1  
 488:7,19  
**reliance** 272:10 446:18  
 458:6,8  
**relies** 202:15 513:21  
**relisting** 336:1 341:13  
 341:16 342:7 345:11  
 354:20 358:18  
**rely** 13:1 15:8 17:21  
 33:16 43:6 53:1 92:2  
 103:8 113:8 123:20  
 314:19 470:10 514:5  
**remain** 42:7 104:17  
 149:7 150:8 318:7  
 371:10 391:9 404:7

404:16,19  
**remaining** 174:5 329:1  
**remains** 40:22 50:13  
 108:6  
**remark** 280:20  
**remarks** 6:14  
**remediation** 369:13  
**remedies** 230:18  
**remember** 55:5 110:3  
 155:1 156:6,17 235:7  
 243:1 244:22 261:20  
 299:12,13 338:3  
 342:18 387:22 475:3  
**remembered** 342:14  
**remind** 7:16  
**reminded** 320:21  
**reminder** 5:10 323:22  
 365:12  
**reminding** 184:22  
**remiss** 7:15  
**remote** 6:2  
**removal** 257:7 324:4  
 328:22 333:16 361:7  
 364:21 382:12 394:2  
 466:19  
**remove** 148:12 259:9  
 289:14 324:2,3,10,12  
 324:17 325:8 326:7  
 326:10 327:5,8 334:7  
 334:11 336:15 337:21  
 337:22 338:5 339:8  
 339:15 342:9,10  
 343:7,13,14 345:20  
 345:22 346:1 349:3,5  
 349:6 350:7,9,10  
 353:5,6,8 356:10,14  
 356:17,18 359:4,8,18  
 359:18 362:11,13  
 363:19 365:15 366:5  
 366:13,14 367:14,16  
 367:17 369:19,22  
 372:10,18,21 375:14  
 393:12 491:20  
**removed** 124:13 135:22  
 167:8 182:21 263:7  
 365:16 467:19  
**removing** 194:5 258:14  
 355:19 380:22 393:10  
**renal** 161:10  
**renew** 102:17 193:14  
 337:17  
**renewal** 101:1,15  
**reorganization** 365:13  
**rep** 78:5  
**repeat** 297:19 506:14  
**repeated** 150:11  
**repeatedly** 516:12  
**repetition** 395:5

**replace** 186:18  
**replacement** 144:16  
 195:11,13  
**replenishment** 452:8  
**replica** 502:1  
**report** 25:13,14 45:11  
 160:3 161:5,18 162:1  
 192:22 211:7,8  
 218:11 273:7 293:22  
 322:4 328:15 341:4  
 344:17 347:15 351:13  
 354:15 358:11 361:2  
 374:21 400:11,11,14  
 429:20,20 431:9  
 441:19 442:6 443:16  
 443:17  
**reported** 135:16 405:12  
 429:8  
**reporter** 318:12  
**reports** 25:16,16 46:10  
 335:18  
**represent** 9:18 54:16  
 177:4,10 226:9  
 272:14 291:11 303:13  
 460:11 463:7 470:16  
**representation** 431:15  
 449:12  
**representative** 99:13  
 384:13  
**represented** 233:19  
 389:6  
**representing** 8:6 18:11  
 78:8 79:18 159:5  
 231:11 351:19 463:14  
**represents** 135:18  
 193:7 269:21  
**reptiles** 37:10 345:8  
**request** 6:18 49:11  
 131:4 142:2 213:14  
 256:8 267:10 291:18  
 291:21 294:3 302:10  
 323:16 345:13 374:20  
 376:20 378:17 400:6  
**requested** 264:16  
 291:22 292:12 296:8  
 381:19 400:9,10  
 421:1 422:1  
**requesting** 390:13  
 403:19  
**requests** 43:18 155:7  
 301:3 374:16 379:11  
 381:5 383:16 400:4  
 401:2 403:8  
**require** 12:20 103:11  
 128:16 142:21 168:20  
 191:5 255:8 260:11  
 284:21 317:3,5  
 390:21 530:18

**required** 66:20 102:1  
 122:16 156:10 160:15  
 166:13 168:11 169:16  
 169:21 170:19 211:10  
 332:16 406:13,14  
 409:8 422:1,12,14  
 431:4 466:2 473:16  
 498:8 517:11  
**requirement** 12:3 51:11  
 83:21 89:22 100:18  
 110:6 113:13,18,20  
 114:7 130:14 131:15  
 151:6 156:4 355:16  
 355:19 421:21 433:17  
 433:19 434:22 435:1  
 435:3,18 436:10,11  
 441:5,7 492:12  
 539:20,22 540:7,9  
**requirements** 14:5,8,19  
 59:10 61:18 81:16  
 90:13 104:5 156:11  
 156:15 181:11 271:10  
 292:18 295:22 323:13  
 434:3 435:8 441:15  
 450:12 451:2,21  
 453:2,8 473:7 487:9  
 521:12 537:22 538:2  
 538:8 540:17  
**requires** 42:13 48:19,20  
 100:18 119:7 207:17  
 405:18  
**requiring** 29:21 267:6  
 292:18 484:22  
**reread** 25:12 377:8  
**research** 63:2,6 64:12  
 80:13 105:5,6,9  
 106:13 107:8,13,22  
 130:4 151:4,15 162:2  
 221:5 234:6,8 235:4,5  
 235:9 236:10 249:3  
 254:14 273:8 303:19  
 336:3,5,9 337:19  
 377:20,20 389:11  
 435:7  
**researchers** 138:16  
**reservations** 329:14  
**reserving** 244:4  
**reservoir** 37:7  
**residual** 216:11 321:15  
 321:18  
**residue** 250:11 253:8,9  
 348:4 406:7 438:12  
**residues** 104:17 415:1  
 467:14  
**resign** 467:6  
**resiliency** 486:4  
**resilient** 25:6,8 36:14  
 486:8 503:21

- resistance** 104:16  
110:16 151:9 272:11  
**resistant** 438:15,19  
**resolve** 68:9  
**resonate** 510:16  
**resonates** 506:13  
**resource** 10:1 23:3  
113:19 131:13,15  
137:19 144:22 202:22  
203:6 254:15  
**resources** 57:18 90:12  
103:12 135:16 143:22  
186:4 284:21 285:8  
317:22 445:16 453:4  
458:16 509:18  
**respect** 5:20 7:17 9:11  
58:21 68:6 83:15  
145:6 150:19 274:12  
289:5 382:17 384:2  
385:4 444:17,18  
502:14  
**respectful** 442:6  
**respectfully** 139:1  
241:12  
**respecting** 316:7  
**respectively** 375:8  
**respond** 153:21 503:21  
535:10  
**responded** 125:17  
**responding** 108:14  
245:10  
**response** 143:2 388:12  
**responsibility** 38:18  
132:9,17  
**responsible** 202:22  
208:6 361:13 445:15  
**responsibly** 94:5  
**rest** 176:14 274:19,20  
275:12 436:8 517:18  
533:18  
**restoring** 43:6  
**restricted** 22:16 381:5  
381:6 402:11  
**restricting** 125:21  
**restriction** 123:22  
**restrictions** 136:10  
191:8 401:6  
**resubmitted** 300:16  
**result** 108:19 164:3,9  
164:21 222:18 230:14  
232:7 292:9  
**results** 17:6,9 161:2  
256:22 361:21 405:9  
**resumed** 282:11 419:7  
**retail** 95:19 173:4 197:7  
197:10  
**retailer** 491:12  
**retailers** 512:17,20
- retain** 162:17 324:4,17  
326:10 327:8 334:11  
339:15 342:9 343:15  
346:1 350:11 353:9  
356:18 359:19 366:14  
367:17 370:1 372:22  
456:12  
**retained** 58:9 371:19  
473:4  
**retaining** 177:12 178:15  
**retention** 361:7  
**return** 39:14 58:18  
419:10  
**reuse** 452:6 453:16  
478:18  
**reused** 452:19  
**review** 4:8 43:14 55:16  
105:18 122:13,17,19  
122:21 144:2 147:9  
147:13 153:16 180:14  
192:16 193:11 221:8  
250:4 256:5 258:9  
278:10 298:9,14  
300:1 301:6 320:20  
321:8 323:9,12 329:4  
335:18 336:4 338:20  
345:11 364:3 374:19  
375:12,18 379:7  
380:6 392:14 400:8  
400:22 404:5 407:10  
411:20 415:16,18  
428:9 488:5  
**reviewed** 162:1 211:10  
380:4,4  
**reviewers** 480:9  
**reviewing** 45:15 258:21  
**reviews** 44:19 161:22  
**revise** 320:11  
**revised** 256:9 472:21  
472:22  
**revision** 197:15  
**revisions** 197:16  
**visit** 234:2 338:17  
432:17  
**revisiting** 338:15  
**revitalizing** 286:6  
**revolution** 500:1  
**reward** 15:7 477:7  
**rewrite** 40:14  
**Rex** 56:18,19,20 67:10  
67:10,11  
**RICE** 1:17 141:17,19  
165:2,13 325:21  
326:19 327:16 331:1  
333:14 334:18 339:21  
343:21 346:6 349:10  
350:13 353:10 357:11  
360:10 363:22 367:5
- 368:7 370:12 373:10  
383:15 386:3 392:1  
392:10 397:9 398:14  
416:15 418:5 426:13  
476:17 481:9 531:16  
534:10 536:8 539:6  
541:12  
**Richard** 156:14 471:21  
**Rico** 485:8  
**rid** 23:1  
**ride** 458:1  
**ridiculous** 319:18  
**rightfully** 300:14  
447:19 487:18  
**Rights** 316:3,6 319:8  
**ringworm** 250:16  
**Ripe** 2:22 50:2  
**risen** 287:5  
**risk** 38:6 122:21 207:9  
218:1 227:2,20  
403:14 422:13  
**river** 248:7  
**roaches** 341:10,17  
**road** 50:15 247:22  
500:21  
**roadmap** 59:18  
**roads** 469:5,5  
**roadsides** 469:3  
**roadways** 328:12 330:8  
333:5 467:2  
**Robert** 3:10 153:20  
158:21 159:1,2  
**Robert's** 385:9 426:4  
**Robertson** 3:11 273:4  
282:2,16,20 283:1,2  
286:17 288:8 290:8  
291:7  
**robin** 427:21 455:15  
**robust** 82:18 103:2  
114:14 126:17 140:6  
380:6 442:13 466:8  
**Rock** 514:3  
**rockweed** 134:19  
137:11  
**rocky** 332:14  
**Rodale** 243:4,4 509:1  
**rodent** 330:19 332:17  
**role** 54:4 103:3 111:4  
154:18 181:20 481:7  
485:12  
**roll** 414:17  
**Ron** 3:8 167:17 172:20  
172:22 174:17  
**roof** 35:13  
**room** 7:18 47:12 52:3  
69:7 73:14 82:7 83:8  
91:9 115:11 127:22  
131:7 233:19 265:4
- 494:1 495:1 504:16  
**root** 191:10 361:13,18  
361:22 437:5 499:3  
537:14  
**rooted** 117:21  
**rooting** 437:18  
**roots** 88:8,9 173:19,22  
174:10 432:13 440:7  
440:9,10 474:5  
498:18,20 531:12  
537:15 539:12  
**rotate** 12:17  
**rotated** 30:12  
**rotating** 11:18,19  
**rotation** 12:1,3,9,15  
29:21 30:6 51:10  
174:19,21 175:1  
238:13 239:11 304:22  
406:7 451:20 452:1  
465:7 478:18 484:5  
501:17  
**rotational** 401:21  
**rotations** 30:11  
**roughly** 69:11 275:11  
277:11  
**round** 64:13 75:13  
427:21 455:15  
**rounds** 38:7  
**route** 263:3  
**routinely** 184:14  
**row** 288:1 503:3,5  
**rows** 288:2  
**rubber** 38:9 50:15  
**rug** 314:4  
**rule** 27:21 80:2 87:9  
94:10 101:4,11  
123:18 124:2 125:13  
125:15,16 126:2  
130:9 140:16 142:20  
145:21 146:3 150:7  
150:15 156:15 226:20  
228:10,18 229:2  
257:8 264:15 292:20  
293:3,7,7 414:8,20  
415:11 455:12 458:18  
464:9 466:6 472:22  
473:1 511:19  
**rulemaking** 228:19,21  
257:17,22 259:10  
260:10 261:4 317:3  
430:5 488:10  
**rules** 74:3 385:9 426:5  
456:14 517:21  
**run** 16:17 45:19 215:16  
245:16 248:9 254:18  
263:14  
**running** 218:17 220:5  
226:11 418:22 499:8

534:12,16  
**runoffs** 329:8  
**runs** 202:14  
**rural** 249:20 253:2  
 286:6

---

**S**


---

**S-H-I-T** 509:16  
**sacrifice** 99:22  
**saddens** 477:1  
**safe** 94:3 159:11 168:7  
 170:16 205:17 207:12  
 208:1 209:20 228:4  
 249:15 253:9 272:20  
 321:19 412:4,4,17  
 413:10 458:19 508:7  
**safer** 46:4,5,6,8 469:16  
**safety** 2:18 56:3 102:22  
 147:18 159:11 162:1  
 205:20,22 206:1  
 207:5,9,11,13,16  
 249:5 271:13 323:13  
 403:13 406:18 408:9  
 408:16,20 409:3  
 411:3,16 413:14  
 446:20 456:17 465:10  
 466:1 468:7 469:17  
 470:2  
**sake** 82:11  
**sale** 216:15  
**Salinas** 509:8  
**salinity** 364:19  
**salmonella** 227:21  
 411:5 413:2  
**salt** 17:10 169:5 170:9  
 242:17 253:11  
**salts** 4:15 193:21 194:3  
 194:12,14 221:19  
 368:16 369:1,4,19  
**Sam** 155:18 472:18  
**sampling** 405:8  
**sand** 145:2 290:20  
 317:8  
**sandy** 290:21 498:5  
**sanitation** 102:13 228:1  
 272:16  
**sanitize** 272:1  
**sanitizer** 271:16 272:9  
 272:11 321:13  
**sanitizers** 43:14 147:8  
 147:10,15 322:12,13  
 323:10,11 509:5  
**sanitizing** 271:10  
**saponification** 328:21  
**satellite** 135:7 143:20  
 146:4 314:10  
**satirizers** 42:16  
**satisfying** 283:18

**sauce** 166:20 168:17  
 172:5  
**saucers** 159:15  
**save** 7:11 174:14 287:7  
 355:9 356:3  
**savior** 500:1  
**saw** 56:5 62:12 204:9  
 330:1 432:9 511:8  
 512:19 514:3 515:19  
**saying** 11:8 33:13  
 74:20 82:4,7 85:20  
 88:3 92:9,16,21  
 146:14 158:10,17  
 166:6 188:11 197:1  
 260:6 323:9 342:14  
 394:18 431:16 527:17  
**says** 30:5 85:9 166:10  
 199:9 293:7 305:16  
 313:1 355:15 383:2  
 415:7 464:10 474:13  
 483:22 490:13  
**scale** 31:9,15 43:3  
 88:11 96:1 97:18 98:2  
 98:3,15,17 106:8  
 240:12 311:8 388:16  
 390:20 391:13 460:5  
 460:10 461:9,22  
 462:16,22 485:21  
**scales** 96:2  
**scarcity** 144:18  
**scenario** 331:17 332:5  
**schedule** 7:2,6,10 18:6  
 41:4 57:8 419:1  
**scheme** 296:17  
**Schkopapani** 513:5  
**school** 31:13 57:10  
 500:7  
**science** 54:2,21,21 90:5  
 135:1 162:1 502:3,4,9  
**scientific** 135:21  
 159:21 161:16 249:6  
 250:12,22 251:5  
 280:4 293:18 295:13  
**scientist** 62:20 166:3  
 221:5 502:9  
**scientists** 135:7 152:22  
**scope** 144:10 158:5  
 301:5 396:1  
**scorched** 36:18  
**scores** 252:4  
**Scott** 1:17 141:6,16,18  
 162:22 330:22 333:11  
 353:7 363:21 383:14  
 391:15,22 476:16  
 481:16 510:18 533:8  
 536:7  
**scour** 136:1  
**scratching** 389:2

**screen** 220:7 506:20  
**screening** 219:11  
**scroll** 353:1 369:17  
 417:21 537:9  
**scrolling** 532:11  
**scrutiny** 268:3 422:12  
**se** 84:8 179:8  
**Sea** 210:22 212:11  
**seafood** 202:1  
**seal** 56:12 229:1 456:15  
 492:15 493:1 520:16  
 521:4,5,7  
**Seaplants** 2:18 133:17  
 133:21 134:22 137:18  
**search** 100:12 261:22  
 267:1,6 421:8 424:18  
 435:4  
**searching** 275:7 422:7  
**season** 30:13,13 439:2  
 466:20 478:15  
**seasonal** 478:13  
**seat** 68:12 281:17 480:7  
 531:5  
**seats** 282:15 419:10  
**seaweed** 245:21  
**second** 11:5 20:7 56:20  
 123:2 207:5 223:5  
 236:13 249:9 280:14  
 300:19 313:14,20  
 316:15 324:9 325:3  
 326:6 347:11 353:3  
 376:5 401:16 423:14  
 423:16 451:12 529:12  
 529:12,19,21 530:8  
 532:10  
**secondary** 499:6  
**seconded** 324:6,16  
 325:10 326:8 327:6  
 334:8 339:13 343:13  
 345:21 349:4 350:9  
 356:16 359:16 366:12  
 367:15 369:20 372:20  
 396:21 398:5 416:5  
 417:22 426:8 531:3,3  
 532:22 533:4 536:3  
 538:9 540:18  
**Secondly** 54:13 109:1  
 139:12 380:19 431:21  
**seconds** 250:15  
**Secretary** 1:12 99:19  
 302:17  
**sect** 85:6  
**section** 25:20 104:9  
 126:1 196:22 321:9  
 328:9 335:14 340:20  
 347:4 368:20 371:1  
 374:17 400:5 417:9  
 417:11,13,14 450:12

450:15 451:15 484:1  
 484:11  
**Sections** 451:17  
**sector** 52:10,11,21  
 75:17 92:5 98:3  
 108:12 119:13 148:10  
 240:15 482:21  
**sectors** 136:7  
**security** 316:16  
**sedges** 223:16  
**sedimentation** 206:19  
**seed** 2:19,20 4:18 36:10  
 37:4,8 63:13 107:20  
 107:22 108:7,9,10,13  
 108:14,17 110:2,4,6  
 110:12,19,22 111:2  
 112:2,6 113:1,4,13,17  
 113:20 114:1,11,13  
 114:14,15,19 115:13  
 116:3 130:1,4,6,9,11  
 130:14 131:11,14,17  
 131:21,22 132:2,15  
 132:18 207:21 254:22  
 255:9 257:10 265:17  
 265:21,21 266:5,9,16  
 266:18 267:3,6,10  
 268:16,18 269:4,9,12  
 309:12 331:14 420:14  
 420:21 421:9,9,13,13  
 421:14,15,19,22  
 422:1,8,13,15,17,21  
 424:18 425:4,9 478:9  
 478:11,11,12  
**seedling** 361:18  
**seedlings** 36:17  
**seeds** 36:12,12,13 37:6  
 108:2 173:22 202:14  
 269:2 422:3 425:9,12  
 425:13 466:17 468:14  
 500:2  
**seeing** 67:10 150:8  
 153:11 240:15 243:16  
 253:20 424:17 464:16  
 476:3 478:5 485:4  
 486:16  
**seek** 55:19,22 479:11  
**seeks** 39:10 266:4  
**seen** 75:9 127:6 240:14  
 289:8 330:7,15,15  
 414:5 443:7,9,10  
 446:11 460:6 477:6,8  
 477:8 478:1,1 480:21  
 493:18 498:4 507:3  
**segment** 303:16  
**Seitz** 1:18 23:18 44:11  
 45:2 75:4 76:2 97:17  
 261:6 325:20 326:18  
 327:15 333:11,17

334:17 339:20 343:20  
 346:5 349:9 350:12  
 354:1 360:9 367:4  
 368:6 370:11 373:9  
 386:2 397:8 398:13  
 409:3 416:14 418:4  
 426:12 481:17 486:20  
 518:19 523:18 531:15  
 536:21 539:5 541:11  
**seizure** 213:20  
**selected** 78:2 169:4  
 177:19  
**selection** 151:6 178:3  
**selenium** 4:14 307:10  
 357:20 358:10 359:13  
**self-tax** 303:18  
**sell** 75:11 173:20,21  
**seminars** 253:14  
**send** 52:13 236:10,11  
 376:4,21 379:21  
 380:20 384:7,10  
 385:11 423:10 426:9  
 522:13 524:16  
**sending** 7:21 377:4  
 383:21 423:21 424:8  
 499:3  
**Senior** 221:5  
**sense** 15:10,16 66:22  
 92:13 93:3 201:21  
 276:10 290:4 317:10  
 319:19 484:22 533:21  
**sensitive** 408:11  
**sensitivity** 251:4  
**sensitizing** 250:12  
**sent** 299:16 381:14  
 428:21 437:3  
**sentence** 5:20 33:15  
**sentiment** 394:2 513:3  
**separate** 84:14 206:15  
 211:18 255:4 324:20  
 324:21 325:6 389:8  
 403:18 493:11  
**separated** 402:2  
**separately** 325:2  
 346:22  
**separation** 184:7  
**September** 161:22  
 376:13  
**sequestration** 485:12  
 488:22 501:10  
**seriously** 155:6  
**serum** 161:7,9  
**serve** 18:12 208:1  
 494:5  
**served** 38:9 53:18  
 99:16,18 155:19  
**serves** 263:22  
**service** 53:4 99:21

121:20 133:13 155:13  
 155:14 217:8 242:1  
 292:22 460:17  
**services** 3:7,10 182:8  
 196:11 225:8,10  
 240:10  
**set** 19:14 45:14 48:18  
 50:20,22 77:12  
 150:10 488:11 507:21  
 517:22  
**setting** 185:22 271:6  
**settings** 151:10,13  
**settle** 141:4,11  
**settled** 474:14  
**seven** 27:5 67:20 91:22  
 116:13 173:18 247:13  
 249:9 270:20 312:22  
 378:1 483:16 537:1  
 539:8 541:15  
**Seventeen** 95:5  
**seventy-one** 95:6  
**severe** 151:12  
**sewage** 94:11 405:18  
**sex** 308:14  
**shade** 289:8  
**shakes** 167:2 168:18  
**shaky** 515:7  
**shape** 8:14  
**shaped** 110:21 489:7  
**share** 117:10 121:3  
 154:16 448:17 481:3  
**shared** 131:10 184:22  
 218:9 225:15 478:4  
**sharing** 44:3  
**sharp** 388:5  
**sharply** 418:20  
**she'll** 240:2  
**sheds** 341:7  
**sheet** 349:1 417:7  
**sheets** 183:6  
**shelf** 159:14  
**shelves** 95:19  
**shielded** 224:17  
**shift** 117:10  
**ship** 202:18 211:18,18  
 212:2,3,4 213:21  
 214:1 217:4,11  
 218:15 219:8  
**shipload** 212:11  
**shipment** 212:7,8  
**shipments** 213:21  
 217:3 218:19  
**shippers** 269:22  
**ships** 211:21 218:4,8  
 220:3  
**Shistar** 3:11 35:22 40:4  
 40:7,8 45:1,3 46:6,13  
 47:9,18 48:10 139:14

**shock** 88:14  
**shocked** 71:4  
**shoes** 471:5  
**shooed** 387:3  
**shoots** 499:4,5  
**shoreline** 135:4 136:7  
**short** 29:19 39:5 108:1  
 122:17 190:19 213:11  
 241:3 252:16 527:9  
**shorter** 483:2  
**shortly** 109:22  
**shoulders** 232:19  
**shout** 101:14  
**show** 114:17 132:4  
 203:17 241:13 274:15  
 329:4 412:17 464:22  
 528:12  
**showed** 63:3 172:15  
 329:6  
**showing** 190:15 222:7  
 222:9,13 424:16  
**shown** 169:12 170:10  
 211:20 274:22 276:1  
 276:3  
**shows** 99:1,2 128:22  
 159:22 222:9 234:6  
 251:13 276:19 440:1  
 467:3  
**shredders** 449:1  
**shrink** 56:6  
**shutting** 384:21  
**siblings** 154:11  
**side** 72:15,16 79:21  
 91:17,18 126:19  
 177:15 234:5,5  
 254:12 275:3 388:9  
 410:9 457:16 461:10  
 496:17 518:15  
**sides** 68:5,6,7 204:8  
 234:18 424:15 443:17  
 491:4 503:7 518:11  
 521:7  
**sign** 97:7 241:7 294:17  
**signals** 499:3  
**signatories** 100:20  
**signatures** 316:1  
**signed** 95:6 313:18  
**significant** 117:8 119:4  
 195:10 228:13 271:2  
 303:2 361:21 449:20  
 461:7 478:9  
**significantly** 309:13  
 406:1 419:1 446:15  
**signing** 313:17 316:3  
**silage** 60:18  
**silent** 7:17  
**silicate** 359:9  
**silicates** 4:14 357:19

358:8  
**silking** 389:22  
**silly** 499:10,11  
**similar** 33:7 124:21  
 157:3 171:6 186:22  
 199:6,19 288:6,7  
 377:6 394:21 435:17  
 436:9 468:5 520:22  
 521:8  
**similarly** 126:14 140:12  
 151:15 169:17 484:6  
 489:22  
**simple** 20:17,18 37:12  
 143:8 213:14 275:19  
 385:10 426:5 494:11  
**simply** 108:20 111:14  
 151:13 394:4 413:15  
 449:11 482:11 503:16  
 505:7  
**Simultaneous** 530:11  
**simultaneously** 347:20  
**single** 66:13 146:7  
 217:11 272:11 375:9  
 403:2 462:4  
**sit** 36:5 72:14 281:17  
 505:20  
**site** 51:4 105:8 142:22  
 313:5 451:8 453:6  
**site-specific** 151:8  
 431:22 445:21 453:4  
**sites** 199:11 446:19  
 456:10  
**sitting** 55:18 480:6  
**situation** 28:10 52:2  
 128:11 178:13 179:8  
 224:14 389:2 524:11  
**situations** 183:13  
**six** 27:5 176:13 215:2  
 217:21 249:11 359:3  
 362:21 363:6,7  
 386:11 486:18 487:13  
 526:19  
**Sixteen** 78:1  
**Sixty** 64:3  
**size** 87:18 97:20 210:16  
 361:18 520:21  
**skills** 477:15  
**skin** 152:15 322:19  
 516:13,15  
**skirt** 239:21  
**sleep** 464:12  
**sliceable** 195:2  
**slide** 6:12 185:13 222:7  
 222:8,13 304:19  
 305:2 340:10 431:12  
 439:20 445:3 469:13  
**slides** 5:8,10 6:3 184:21  
 428:5 437:3 441:21

450:14 470:14  
**Sligh** 243:8 517:9  
**slight** 197:15  
**slightly** 33:10 456:3  
**sliver** 439:5  
**slow** 22:10 215:15  
**slowly** 438:21,22,22  
**sludge** 94:11 405:18  
**small** 31:9,14 68:17  
 88:11 97:18 98:3,16  
 137:15 166:1 173:14  
 188:20 222:18,21  
 225:11 226:9 285:2  
 319:16 424:5 438:9  
 439:8 460:7 462:7  
 480:20  
**small-scale** 461:19  
 462:5,21  
**smaller** 71:7 274:8  
 303:10 390:20 391:13  
 460:10 461:9 462:16  
**smart** 203:2,5 232:8  
**smarter** 202:22 231:16  
 231:17  
**smartest** 232:9  
**smoke** 246:16 371:16  
**smooth** 168:21 172:5  
**smoothies** 181:19  
**snakes** 449:7 454:20  
 455:7  
**so-called** 452:18  
 480:21  
**soap** 221:8 224:2  
**soap-based** 4:9 328:4  
 328:11,17 334:7  
**soaps** 221:22 222:1,2,2  
 222:4,4,15 223:1  
 328:22  
**social** 248:20  
**society** 37:16 52:3  
 150:3 493:5  
**sodium** 4:9 102:3,6  
 159:9,12 160:14,19  
 160:22 161:3 162:18  
 163:2,9,17,19,20  
 164:2,4,8,9,11,12,12  
 164:15,16,19,20  
 165:1,16,21 166:7  
 167:2,21 168:5,10,12  
 168:16,21 169:4,10  
 169:11,13,14,15,17  
 169:19 170:2,5,11,11  
 170:13,15,18 171:9  
 172:12,13 193:11,14  
 193:16,20 194:14,14  
 194:17 195:1,12,14  
 270:11 271:21,21  
 321:2 322:3 324:14

327:5  
**softer** 187:2  
**softly** 310:14  
**software** 213:7  
**soil-** 317:19 329:16  
 444:22 486:4  
**soil-based** 86:11  
 284:22 457:20 459:4  
 463:3 465:1,6 466:5  
 468:5,20 469:7,11  
 470:8 483:15 484:22  
 486:13 491:5 521:13  
**soil-borne** 452:10  
**soil-dwelling** 447:13  
**soil-grown** 457:13  
**soil-less** 155:21  
**soil-like** 190:5  
**soil-only** 514:22  
**soiled** 516:17  
**soilless** 95:11 97:10  
 472:14 477:20  
**soils** 63:5 86:13 223:3  
 290:20 291:2 429:13  
 490:19,22 501:7  
 502:21  
**solanums** 30:15  
**solar** 88:18 202:15  
 361:12  
**sold** 179:4 296:1,1  
**soldier** 304:1,16 305:4  
 305:8,21 306:2  
 308:10 310:21 311:16  
 493:2  
**solely** 195:16 213:7  
 236:19 478:10 511:2  
 513:21 514:5  
**solicit** 105:19  
**solicits** 514:2  
**solid** 11:1 187:1 402:3  
 450:3  
**solidify** 199:18  
**solids** 180:21 183:14  
 183:16 402:2  
**soluble** 4:13 19:7 21:3  
 65:22 123:14,21  
 124:2 125:12,19,22  
 180:21 354:5,14  
 356:14 358:17  
**solulyze** 194:7  
**solution** 47:17 65:22  
 70:22 117:13,21  
 123:11 251:17 432:14  
 494:8,10,18 531:13  
**solutions** 24:13 92:3  
 111:3 116:6 119:15  
 450:3,4  
**solve** 494:2 510:3  
**solving** 219:19

**somebody** 69:5 157:9  
 218:7 320:6 342:19  
 437:3 463:20 511:1  
**someday** 476:3  
**something's** 128:2  
**somewhat** 17:2,10 76:3  
 78:19 154:1 262:8  
 268:19 476:21 528:4  
**soon** 223:18 271:11  
 273:21 481:7  
**SOPs** 267:9  
**sorry** 5:6 7:20 18:7 61:8  
 91:15 121:13 126:6  
 136:9 142:9 146:17  
 158:22 166:4 175:13  
 176:18,19,22 196:4  
 224:7 281:16,21  
 340:16 351:16 356:19  
 391:16,22 423:18  
 476:8 526:4 530:7  
 533:8 534:14  
**sort** 13:16 15:19 66:22  
 69:1 88:9 238:12  
 337:14 394:14 442:8  
 476:14 479:21 525:15  
 527:16  
**sorts** 129:3 238:1  
**soul** 40:1 156:18 525:8  
**sound** 25:1 105:13  
 107:4 134:14 488:4  
 510:7  
**sounds** 151:22 232:5  
 309:1  
**soup** 154:13  
**sour** 170:13  
**source** 113:1 114:11  
 126:12 132:18 175:5  
 185:17 206:6,11  
 308:5 448:17 488:1  
**sourced** 425:10  
**sources** 123:21 125:22  
 174:21 191:1 262:10  
 382:18 409:14 422:7  
 436:14  
**sourcing** 110:4 134:12  
 186:7 255:9 266:18  
 267:10 268:17 308:5  
 310:19 478:9  
**south** 79:7 241:6  
 246:18 392:22 491:13  
**Southern** 302:16  
**sow** 449:3  
**soy** 125:3  
**soybean** 390:3,5  
**soybeans** 212:14 216:7  
**space** 150:22 455:1  
 514:16  
**spaces** 514:14

**Spanish** 498:2  
**speak** 8:3 12:22 14:6  
 16:12 71:4 76:4 77:11  
 78:14 112:9 163:18  
 167:3,6 205:19  
 218:16 231:12 247:3  
 301:1 391:19,20  
 410:22 479:4 512:16  
**speaking** 99:13 147:2  
 167:5 247:10,14  
 315:18 318:5 423:1  
 530:11  
**special** 113:7 447:1  
**Specialist** 2:2,4  
**Specialties** 3:2 167:19  
**specialty** 177:22 337:9  
**species** 105:12,15,15  
 105:22 106:18 107:3  
 107:8,10 134:8  
 135:19 136:2 150:22  
 151:7 207:1 224:4  
 501:16,18 516:14  
**specific** 51:4 87:6  
 105:9 108:2 132:19  
 139:5 140:1,5 161:12  
 165:4 167:3 178:1  
 180:18 193:18 201:17  
 224:18 237:4 266:9  
 266:10 269:10 274:22  
 289:17 345:6 375:13  
 421:9 531:9  
**specifically** 163:22  
 166:3 190:8 193:16  
 194:17 219:21 268:11  
 301:5 383:17 454:3  
**specificity** 263:13  
**specifics** 204:5  
**specified** 405:5,15  
**specifies** 402:15  
**spectrum** 176:6,12  
 307:4 444:22 445:1  
 505:5 510:22  
**speech** 316:9,21 318:4  
**speed** 249:7 250:9  
**spend** 72:3 283:20  
 284:2 332:21 499:10  
**spending** 227:8 313:21  
**spent** 20:12 254:13  
 283:19  
**spice** 102:11  
**spiders** 345:8  
**spinach** 88:20  
**spirit** 233:2,17 479:6,7  
**split** 128:14 204:9  
 429:11 477:1  
**splitting** 361:5  
**spoke** 269:7 376:18  
**spoken** 376:16

- sponsored** 161:15  
**spoonable** 187:3  
**spore-forming** 404:15  
**spot** 241:15  
**spotlight** 407:3  
**spots** 286:3  
**spouts** 538:6  
**spray** 467:10 468:16  
469:5  
**sprayers** 224:17  
**spraying** 331:17 469:3  
**sprays** 467:2  
**spread** 135:13  
**spreadable** 194:21  
**spreads** 184:16,17  
186:15  
**spring** 36:15 131:8,10  
133:5 143:2 165:3  
292:1 338:15 344:22  
348:3 365:3 429:1  
476:11 507:16  
**sprout** 192:1 321:21  
**sprouts** 173:3 191:21  
191:22 434:1 441:13  
450:5 540:15  
**square** 276:14 277:12  
**St** 167:20 251:3 499:21  
**stability** 22:4 170:20  
180:2  
**stabilizes** 194:8  
**stable** 59:5 63:4 159:14  
181:8  
**staff** 2:1 48:1 98:11  
208:4 242:6 254:1  
**stage** 40:18,21 263:9  
401:9,10,16,19  
402:12 405:3  
**stages** 260:11  
**Stahlbush** 410:14  
**stake** 118:17 287:8,8  
**stakeholder** 54:15  
380:15 463:7,10  
**stakeholders** 147:20  
380:11 463:15 523:6  
**stalemate** 528:17,19  
**stalk** 135:12,19  
**stamp** 38:9  
**stance** 430:14  
**stand** 6:3 19:14 24:7  
232:18 299:2 534:5  
**standard** 50:18 52:8,8,9  
52:13,15,21,22 67:7  
75:6 81:17 85:3,18  
92:11 105:3 106:20  
107:11 119:5 136:20  
257:11 336:14 400:6  
402:6,7 417:11 441:4  
445:20 451:17 453:19  
482:18 483:14 510:13  
524:7 534:6 539:19  
540:6  
**standardized** 515:13  
**standards** 1:3 2:3 15:5  
33:22 34:5 39:4 44:17  
50:10,14,21 56:9  
59:18 60:3,4 61:13  
66:18 70:19 81:8,15  
82:22 83:5,19 90:10  
90:20 92:6,22 117:6  
117:12 118:1,6  
120:19,21 140:21  
141:12 154:15 156:19  
158:6 200:19,20  
201:5 228:15 246:10  
260:8 285:14 289:18  
319:22 428:12 430:1  
445:6 472:12 488:11  
507:21 508:3 517:16  
**standing** 95:7 135:12  
135:18 224:12 514:3  
**standpoint** 294:1  
295:14  
**stands** 444:4  
**starch** 171:5  
**starches** 171:16  
**start** 6:4 7:22 18:8  
19:11 21:11 35:22  
40:5 49:18 56:22 81:1  
93:11 99:8 121:14  
123:17 126:7 129:20  
133:11 142:11 146:21  
149:21 177:1 179:11  
179:14 182:4 188:16  
189:10 200:2 204:20  
221:2 225:5 240:7  
248:11 264:9 265:12  
266:21 282:18 287:10  
312:8 315:16 320:20  
321:8 324:7,16,18  
325:7,10 326:9 327:7  
334:10 339:14 346:2  
348:20 350:11 359:17  
364:14 370:2 373:1  
385:14 397:2 398:8  
418:1,20 419:4 426:8  
478:15 480:3 485:13  
531:5 533:8 536:7  
538:13 540:21  
**started** 7:19 17:20  
30:10 31:22 32:8 71:1  
73:14 208:19 211:14  
240:12 245:12 282:14  
286:11 376:11 391:6  
419:11 428:14 487:12  
511:22 518:13  
**starting** 5:3 67:16 102:2  
122:4 189:2 288:4,22  
314:1 318:11 331:14  
501:4 542:2  
**starts** 5:17 343:16  
349:7 353:7 356:19  
356:19 366:15 367:18  
416:10 542:1  
**startup** 286:13  
**state** 2:12 12:22 18:16  
57:4 80:17 92:5  
105:10 154:4 270:18  
273:5 293:1 308:14  
401:15 439:14,21  
471:11 491:9 526:7  
**stated** 95:10 140:16  
158:16 190:4 329:15  
352:22 355:1,13  
365:2 412:10,12  
447:8 457:17 459:5  
471:17 472:22 473:2  
487:17 515:5 526:10  
**statement** 33:7 85:10  
85:15 109:18 156:10  
156:22 158:4 159:21  
160:6 329:6 472:13  
**statements** 135:2 157:4  
**states** 1:1 14:7 116:15  
163:4,7 210:13,14  
214:9 224:16 270:17  
305:7,17 402:8 415:9  
461:8 470:20,22  
492:2  
**stating** 6:5 158:3  
355:14  
**statistic** 460:19  
**Statistics** 460:17  
**status** 43:16 517:5  
**statute** 483:13 486:22  
**statutory** 471:16  
**stay** 332:22 502:21  
**stayed** 450:1  
**steal** 244:3  
**steel** 515:22 516:8  
**steep** 333:6 481:21  
**steer** 266:4  
**steering** 36:6  
**step** 42:13 51:17 52:6  
77:1 79:8 106:10  
124:5 127:9 231:18  
255:20 428:17 439:3  
525:14  
**Stephen** 3:12 142:8,10  
142:11 146:16  
**stepping** 238:5  
**steps** 42:4 44:4 127:8  
429:22 525:16  
**sterilize** 271:19  
**steroid** 148:15  
**Steve** 1:15 65:13 133:1  
137:7 138:12 142:14  
153:3 174:17 186:10  
294:13 297:9 332:10  
339:14 342:13 347:18  
349:4 350:8 359:16  
366:12 376:18 382:22  
384:18 387:4 388:11  
393:13 398:8 417:22  
423:19 499:18 504:9  
538:9  
**Steve's** 153:21  
**steward** 252:5  
**stewarding** 94:5  
**stewards** 11:4  
**stewardship** 445:15  
**stick** 7:6 17:18  
**sticks** 144:8  
**sticky** 4:11 344:12,16  
345:20  
**stiffer** 188:3  
**stifle** 457:10  
**stimulation** 361:13  
**stipulate** 450:21  
**stipulated** 405:20  
**stipulations** 454:1,17  
**stirred** 184:2  
**stole** 449:10  
**stomach** 322:22  
**Stoneback** 243:4  
**stood** 300:16  
**stop** 20:6 27:15 83:12  
141:5,6 187:13  
203:10 238:8 294:14  
441:16 499:17  
**stopped** 212:2,3,7  
**store** 74:10,11 475:7,9  
**stores** 75:9,12 250:2  
486:16  
**storing** 496:12  
**storms** 136:1  
**story** 241:11  
**Stowe** 100:22  
**straight** 300:10  
**straightforward** 206:13  
**strains** 151:12  
**Strategic** 2:21 50:1  
**strategies** 107:6,14  
108:16  
**strategy** 23:1,3 103:20  
106:5 107:2,12  
119:14  
**Straus** 252:12,12  
**straw** 21:1  
**strawberry** 508:17  
**stream** 466:15  
**street** 1:9 73:2,18  
**strengthen** 104:21

110:1 122:8 189:17  
424:19  
**strengthening** 4:18  
112:2 130:6 265:16  
268:15 420:14 422:17  
**stress** 24:22 364:19  
**stressed** 24:18 25:3  
376:18  
**stresses** 25:6  
**strict** 15:5 74:4 207:7  
524:7  
**strides** 50:5 187:6  
303:2  
**strike** 317:6  
**striking** 503:12  
**stringent** 14:4 208:10  
**strong** 52:12 57:13  
60:21 74:5 81:8,15  
130:19 463:4 521:6  
**stronger** 130:21 194:19  
424:20 515:11  
**strongly** 82:20 119:3  
123:4 144:11 147:11  
148:11 159:8 221:12  
255:21 272:14 295:15  
297:16 364:20 458:12  
483:22  
**struck** 55:1 480:2  
**structural** 340:22 342:8  
343:9  
**structure** 35:11,12  
179:18 187:3 194:10  
537:14  
**struggle** 446:14  
**struggling** 257:3 262:7  
**stuck** 233:20  
**student** 19:11 32:6  
499:20  
**students** 19:10 31:19  
32:2  
**studied** 83:19  
**studies** 249:3 250:8  
251:9 253:8 274:2  
278:17 361:15  
**study** 63:2 69:10 70:1  
137:2 192:22 251:22  
303:22 304:2 309:7  
**studying** 497:5  
**stuff** 23:2 48:6 75:22  
86:9 248:4 317:9  
331:18 449:15 476:5  
509:5  
**sub** 209:11  
**subcommitte's** 109:19  
110:1  
**subcommittee** 4:3,7  
11:12 14:13 27:2 49:2  
52:14 58:8 59:6 93:16

109:5,12 116:20  
123:10,22 130:6,18  
131:5 133:3 141:2,14  
149:12 154:21 189:21  
189:22 190:7,8  
227:12 255:12 265:16  
293:8 294:10 295:1  
298:4,7 301:4 302:1,6  
320:14,16 324:6  
336:2 337:3,16 338:4  
342:3 352:10 355:11  
356:9 360:19 371:18  
372:1 374:20 376:4  
377:2 379:4,6,22  
381:12 385:13,16  
386:18 399:21 400:9  
407:9 419:2 422:21  
423:4,6,11 426:3,10  
428:18 429:15,16,18  
430:10 431:10 432:7  
459:3,6 482:6 493:16  
494:14,17,17 525:17  
531:4 533:1 537:18  
542:2  
**subcommittee's** 81:14  
103:6 148:12 159:9  
162:5 196:17 198:1  
228:6 383:18  
**subcommittees** 147:13  
147:14 196:14  
**subject** 104:17 133:20  
267:16,17 383:21  
406:13 411:11 488:10  
**submission** 221:18  
**submit** 48:15 91:18  
267:8 294:19,20  
296:18,21 300:13  
**submitted** 40:12 45:11  
100:15 105:18 142:1  
142:16 165:6 168:3  
196:13 197:16 221:14  
223:8 259:18 265:2  
270:4 294:21 296:14  
296:15,15 297:13  
298:21 374:11,12,15  
378:15  
**Subpart** 451:3  
**subsequently** 535:6  
**subset** 442:21  
**substance** 347:12  
361:20 362:11 363:13  
363:19 375:14 380:22  
386:14 395:5 396:17  
406:21 415:1  
**substance's** 335:17  
**substances** 4:8 104:13  
321:10 333:12,18  
362:2 368:14,21

473:14,18  
**substantial** 376:22  
431:18  
**substantially** 84:11  
**substantiates** 363:17  
**substantiation** 411:8  
**substantive** 423:5  
**substitute** 318:18  
**substitution** 50:21  
495:20  
**substrate** 10:16 39:15  
51:7 60:12 88:8 192:1  
236:14 437:6,14,15  
464:19  
**subtract** 436:6  
**subway** 498:4  
**success** 225:20 493:6  
**successful** 31:14  
**successfully** 21:3 94:9  
137:20 295:21  
**succinct** 6:19 49:12  
75:1,1  
**succinctly** 24:5  
**sucker** 296:9 374:18  
375:11 394:2  
**suckering** 389:9  
**suckers** 375:15 393:12  
**Sue** 1:13 25:11 28:11  
74:18 75:2 76:5 86:2  
86:5 215:19 309:3,4  
328:4 333:2 334:8  
345:21 356:20 414:16  
424:21 470:12 483:1  
506:12,18 523:17  
524:19 526:4 538:13  
**sued** 318:21  
**suffer** 79:6 230:4  
**suffering** 252:7  
**sufficed** 285:1  
**sufficient** 284:19  
407:13 413:14  
**sufficiently** 92:12 93:6  
185:20 318:10 408:16  
462:17 488:9  
**sugar** 179:20 180:21  
181:1,2,14 184:18  
**suggest** 106:20 134:22  
135:3 145:14 160:19  
217:14 345:14 402:11  
**suggested** 46:3 124:18  
136:4 143:19 159:19  
196:21 197:16 212:1  
266:1 384:14 421:16  
422:10 492:13  
**suggesting** 91:10  
**suggestion** 134:3 198:6  
199:5 519:12  
**suggestions** 118:14

137:14 220:14 430:8  
508:6  
**suggests** 160:12  
**suitability** 150:20 151:8  
**suitable** 170:21 195:11  
195:13 291:2,3  
**suites** 498:19  
**suits** 55:20  
**sulfate** 4:11,16 346:21  
347:12 348:22 349:2  
349:3 371:3 417:7  
**sulfates** 4:13 357:18  
358:8 359:8  
**sulfites** 198:12  
**sulfonate** 260:14  
**sulfur** 152:14 226:14  
229:7,15  
**sum** 27:11  
**summarize** 322:10  
427:18,19,20 456:10  
**summarized** 432:3  
**summarizing** 456:1  
**summary** 170:15  
431:11,13 442:16  
470:6 490:5  
**summer** 30:15  
**sun** 20:11 38:2  
**sunset** 4:8 41:3,17 43:7  
55:16 117:1 193:11  
221:8 256:21 258:3,8  
258:15 260:13 321:8  
324:1,1 335:17 365:8  
365:13 388:1  
**sunsets** 320:20 370:20  
**superior** 169:5  
**supersede** 395:13  
**supplanted** 75:12  
**supplement** 194:4  
**supplemental** 29:13,14  
400:21 473:1  
**supplied** 103:18 266:22  
295:14 433:17 435:1  
441:5 537:22 539:21  
540:8  
**suppliers** 101:18  
178:22 179:2 193:9  
421:13  
**supply** 2:17 4:5 42:4  
111:1 116:18 119:2,8  
120:14 126:16,17  
162:11 196:16,20  
215:22 237:6 267:6  
267:18,19 283:3  
285:16 291:11 305:15  
374:16 424:20 475:12  
478:11  
**support** 11:8 20:9  
57:13 60:9 61:2 81:8

- 84:12 101:6 103:3  
104:14 105:6 107:11  
109:10 112:13 116:22  
117:16 118:8 122:2  
123:9 130:19 131:16  
134:2,11 139:6,15  
142:20 147:11 152:8  
155:16 162:4,13,16  
162:19 167:21 178:10  
189:20 197:15,18  
199:19 221:10 227:14  
228:6,20 250:13  
255:21 265:22 267:5  
272:18 283:9 290:16  
290:17 293:19 331:4  
345:11 347:21 351:20  
352:7,9 361:11  
374:19 378:6 400:8  
412:9 443:11,12,17  
462:5 463:8,11 470:8  
470:9 482:4 487:3,14  
490:10 494:16 495:15  
504:14 505:10 515:12
- supported** 58:7 77:7  
159:11 266:17 336:1  
341:13 355:11 422:9  
490:2
- supporters** 150:5
- supporting** 19:18 47:14  
108:21 110:3 444:15  
453:11 489:9
- supportive** 109:1  
354:20 358:18 526:17
- supports** 58:4 103:6,14  
123:3 133:22 141:14  
148:11 159:8 177:12  
193:13 196:19 272:14
- Suppose** 60:13
- supposed** 101:2 329:18  
410:14
- Suppress** 223:14
- surface** 114:7 224:14  
248:19 537:15
- surfactants** 45:8
- surprise** 495:13
- surrounded** 8:22 391:7
- surrounding** 134:20  
135:1 453:7
- survey** 17:6,9 73:19  
96:20,22 236:10  
256:21 258:15 460:18  
461:13
- surveys** 261:11
- survival** 94:22 151:14  
493:13
- survive** 25:9 404:13,18  
404:20
- suspended** 88:17
- 432:13 531:12
- sustainability** 38:6  
50:22 64:9 205:7  
445:16 454:4 457:2  
458:21 488:15 496:7
- sustainable** 2:16 19:17  
37:20 134:13 137:13  
137:15 138:2,18  
173:7 178:11 189:14  
366:9 375:22 407:2  
457:20 458:9 495:8  
495:20 497:20 508:7  
510:6
- sustainably** 237:13
- sustains** 94:5
- sustenance** 39:8
- Suzanne** 3:6 146:19  
149:19,22 152:10  
153:10
- SWAFFAR** 1:12 62:15  
87:13 152:10 153:3,9  
163:16 208:14 219:15  
229:6,12 272:22  
273:3 294:15 319:6  
325:19 326:17 327:14  
331:11,21 332:3,9  
334:16 339:19 343:19  
346:4 349:8 351:3  
353:22 357:10 360:8  
367:3 368:5 370:10  
373:8 377:12 386:1  
389:15 390:14 398:12  
416:13 418:3 424:11  
426:11 490:18 528:10  
532:6 536:20 539:4  
541:10
- swath** 81:19
- swear** 237:1
- sweeping** 202:9
- Sweet** 231:11
- swept** 314:4
- swine** 150:21 151:2
- swinging** 481:8
- switch** 95:17 298:13  
299:10
- switching** 299:5
- sword** 521:21 522:2,3
- symbiotic** 447:17
- Synergy** 104:14
- synthetic** 73:21 149:10  
198:2 221:13,20  
222:22 304:14,18  
306:10 321:10 372:18  
375:21 382:14 386:17  
386:19,20 387:10,20  
392:19 394:9 396:18  
396:20 397:1,2 401:4  
416:6,7
- synthetics** 68:1
- syrups** 101:22
- system's** 11:3
- systems-based** 448:8
- 
- T**
- 
- T-U-U-M** 471:22
- table** 174:14 248:3  
435:10 444:3 490:10  
541:19
- taken** 50:12 106:10  
107:1 143:12 158:2  
255:20 461:3 494:17
- takes** 21:15 203:3 208:1  
249:11 332:21 355:16  
530:2
- tale** 185:14
- talk** 32:3 44:1 53:22  
64:9 87:14 98:16  
120:6 124:4 157:15  
221:7 226:13 230:11  
231:17 238:2 243:2  
243:22 251:20 283:15  
293:16 297:18 303:19  
347:19 364:9 372:7  
381:13 382:3 423:3  
470:15 498:20 499:15  
512:2 521:15 525:16
- talked** 34:16 72:7,11  
204:6 250:19 252:14  
252:18,20 253:13  
257:15 263:1 309:20  
310:13,14 323:10  
338:15 458:18 479:16  
503:1 517:8
- talking** 92:20 98:11  
179:14 204:5 212:16  
236:20 256:11 258:9  
267:5 276:11,13,17  
378:22 393:6 428:3  
454:22 486:15 494:9  
512:5 516:8 534:19
- talks** 127:7 185:14
- tally** 532:8
- tanks** 206:17,18 272:4
- TAP** 160:3 293:22
- target** 105:14 345:16  
497:9
- targeted** 345:7
- targeting** 345:6
- tartar** 256:13,20
- tartrate** 102:4 196:18  
197:22 198:10,13  
256:12
- task** 18:22,22 25:13  
32:3 35:6 47:4 53:20  
134:10 155:19 178:18  
179:7 191:12 200:8
- 204:7 208:18 302:19  
303:5 306:7 429:8,20  
430:7 431:11 434:4  
443:15
- taste** 73:18 169:7  
170:14,20 311:2
- tasting** 73:14
- tasty** 154:14
- taught** 19:4 26:15 28:14  
464:2 470:21 471:12  
498:2
- taxi** 248:7
- taxonomy** 134:6
- tea** 174:8,8,8 175:7  
289:3 371:16
- teach** 18:17,20 28:16  
30:4 464:10 498:1
- teachers** 138:17
- teaching** 31:13
- team** 44:2 185:1 207:22
- tearing** 68:3
- tech** 278:9
- technical** 44:19 46:10  
161:5 167:9 182:8  
240:16 241:14 254:4  
278:10 298:9 322:4  
328:15 329:4 335:18  
336:4 338:19 341:3  
344:17 351:13 354:15  
358:11 361:2 374:21  
375:12,18 400:11,13  
400:22 404:5 407:10  
415:18 482:1
- technically** 430:8  
533:11 534:12,15
- techniques** 95:15 289:9  
406:8
- technologies** 212:21  
232:12 284:21 285:15  
457:22
- technology** 205:4 457:8
- telephone** 464:5
- tell** 20:14 21:15 44:13  
55:7 67:21 70:4 76:16  
83:19 87:18 137:19  
149:3,7 176:5 183:1  
185:10 198:22 216:12  
241:11 242:12 247:16  
311:1 373:21 437:12  
459:13 464:2 534:19
- telling** 149:4 215:4  
320:1 475:21 535:15
- temperate** 155:3
- temperature** 10:17  
24:21 36:14 304:8  
401:14 402:16,19  
405:11,14 409:22  
410:6 412:21 452:11

- temporary** 154:17  
**ten** 48:1 173:18 278:4  
 339:3 375:8 393:3  
**ten-acre** 287:10  
**ten-minute** 418:19  
**tend** 187:2 390:19  
**tendency** 71:10  
**Tennessee** 210:15  
**tens** 228:19  
**tension** 13:14 127:4  
**tenth** 27:8  
**term** 22:10 39:5 94:19  
 149:13,14 202:3  
 213:11 352:3 458:21  
 473:2,9  
**terminology** 109:2,9  
 199:7,15,19 256:4  
**terms** 9:19 14:8,17 15:1  
 44:4 75:11 107:6  
 109:13 123:6 127:6  
 164:9,18 205:7  
 237:22 238:11 256:10  
 262:18 263:6 276:9  
 338:17 378:14 406:3  
 410:22 486:12 508:3  
 508:14,20 525:17  
**terrestrial** 65:20 428:12  
 445:7 450:2,10,20  
 537:14  
**Terry** 3:11 35:21 40:4,5  
 40:7 43:9,13 46:12,16  
 49:9 139:14  
**test** 305:12 310:18  
**testified** 32:17 34:6  
 75:7  
**testifiers** 97:17 483:8  
**testify** 99:1  
**testifying** 50:1 93:15  
**testimony** 98:7 283:14  
 483:10 485:19 486:4  
**testing** 108:15,20  
 336:19,22 337:1  
 338:21 354:13 355:7  
 355:14,16,20 356:2  
 358:7 359:2 412:21  
 413:1,7,7,13 422:14  
**Texas** 210:15 243:12  
**texture** 164:19,20 169:6  
 170:7,9,20 183:17  
 184:13 186:22 187:3  
 187:17  
**thanks** 28:13 49:20  
 53:13 76:4 84:7 86:1  
 87:13 89:18 96:14  
 120:2 121:7 129:10  
 133:12 145:11 149:18  
 154:8 176:20 192:18  
 196:7,8 199:22 210:3  
 237:8 242:5 248:13  
 265:9 291:5,7 322:6  
 335:19 341:4 344:18  
 347:2,17 351:14  
 354:16 358:1,12  
 361:3 368:18 369:2  
 371:4 375:3 400:16  
 476:17  
**thee** 52:2,8 526:11  
**theoretically** 318:15  
 480:11  
**therapies** 249:2,6,21  
 250:10  
**thereof** 204:4 316:8  
**they'd** 114:19  
**thick** 127:4 298:21  
**thicken** 162:6 184:4  
**thickener** 184:11  
**things** 13:7 22:1,6 25:8  
 31:1 35:14,18 46:22  
 47:22 53:2 89:11  
 127:2,12,12,14,15  
 128:9 137:12 163:11  
 175:12,19 186:18  
 213:11 226:13 230:19  
 232:8,9 238:1 250:2  
 252:1,6 256:17 260:1  
 288:1 307:18 308:2  
 312:12 315:1 323:3  
 337:18 384:14 389:20  
 465:5 467:22 479:6  
 485:4 486:2,3 495:14  
 495:16,19 500:22  
 508:14 509:4 516:20  
 517:12 518:10 527:20  
**thinks** 65:6,12  
**thinned** 393:18  
**thinning** 393:16  
**third** 57:11 123:9 127:3  
 150:9 207:18 234:5  
 400:10 429:12  
**Thirdly** 160:11  
**Thirty** 247:20  
**Thomas** 471:15,17  
**thorough** 400:18  
 415:16  
**thought** 34:20 35:3  
 58:4 73:19 74:21  
 119:22 123:15 129:12  
 157:12 204:10 285:14  
 293:2 342:13 380:7  
 394:11,16 423:4  
 433:13 476:19 482:3  
 512:8 525:8  
**thoughtful** 120:1 203:1  
 420:22  
**thoughtfulness** 525:5  
**thoughts** 47:6 115:5  
 136:21 154:16 155:17  
 198:20 258:6 407:6  
**thousand** 95:5  
**thousands** 81:5 228:20  
 285:5 464:3 516:14  
**thread** 220:3  
**threat** 94:15,22 98:18  
**threatening** 38:19  
**threats** 94:13  
**three** 5:15,18 14:2  
 19:21 21:13 22:1 24:6  
 25:16 27:3 28:6 32:16  
 79:15 104:12 106:16  
 106:19 108:2 109:10  
 138:22 142:17 168:13  
 180:9 211:20 215:7  
 216:14 240:20 254:17  
 258:2 259:16 261:21  
 262:3 266:16 287:11  
 308:2 316:22 321:5  
 321:11 322:1,8,10  
 324:8,11,20,21 325:5  
 325:5 359:4 360:18  
 362:8 415:7 422:8  
 436:5 476:14 487:7  
 495:11,16,18 497:22  
 515:16  
**three-year** 303:21  
 451:10  
**threshold** 266:10  
**thresholds** 266:12  
**thrive** 130:17 447:15  
**thriving** 151:14  
**throat** 322:21  
**throw** 73:1 522:6  
**throwing** 69:2 238:6  
**ticks** 227:6  
**tie** 89:12  
**tie-up** 501:8  
**tied** 127:21 128:1  
 151:18 458:4  
**ties** 412:21  
**tight** 72:1  
**tight-knit** 512:17  
**tighten** 126:3  
**tightening** 118:19  
**Tilapia** 39:18  
**tillage** 484:5  
**tilling** 90:18  
**timeframe** 7:3 29:22  
 451:10  
**times** 48:13 53:6 98:20  
 150:17 225:16 230:1  
 263:11 288:13 309:21  
 325:5 333:5 341:8  
 377:7,18 378:1 388:6  
 425:2 472:19 498:7,9  
**timing** 267:1 407:17  
 487:5 504:12  
**tip** 502:5  
**tips** 498:19  
**tirelessly** 493:17  
**tissue** 250:5 253:8  
**to-harvest** 401:6  
**tobacco** 4:16 246:13,15  
 246:16,19,20 247:13  
 292:16 296:12 297:7  
 298:10,11,13 299:3  
 299:10 300:17 302:3  
 302:6 370:20 371:2  
 371:15 372:2,19  
 375:15,18,19 378:16  
 378:22 379:1 380:5  
 381:21 382:8 383:9  
 383:10,17 387:14  
 389:10,16 391:8  
 392:6,13,21,22 393:1  
 393:9,12 394:22  
 395:6,13,16 396:1  
**tobacco-heavy** 391:4  
**today** 8:4 49:13 50:1  
 92:6 93:15 99:13  
 147:2 150:4 168:9  
 180:15 193:11,15  
 196:15 202:21 205:15  
 226:9 270:5,14 278:3  
 284:16 285:11 302:20  
 312:13 315:15 320:15  
 384:1 423:7 442:14  
 443:9 444:4 474:9  
 485:1 489:15 494:14  
 500:13 505:20 513:5  
 520:2 541:17  
**told** 21:9 26:9,10,11  
 212:4,5 218:6 296:19  
 298:10,20 300:13  
 428:15 429:19 462:8  
 516:12  
**tolerance** 347:7 422:19  
**tolerate** 25:8  
**Tom** 1:9,11 2:17 49:20  
 53:13 115:4 121:7,16  
 138:10 153:6 243:3  
 247:6,21 282:2,17  
 291:8,11,19 293:10  
 294:12,15 296:5,7  
 302:11 320:18 323:20  
 324:19 334:2,5 339:6  
 343:5 348:18 356:12  
 372:16 373:18 378:8  
 379:2 387:21 396:13  
 414:17 415:12,20  
 472:10 481:7 487:4  
 517:8 525:21 526:14  
 541:16  
**Tom's** 383:22 481:7

- tomato** 394:2 496:21,21  
496:22 497:12,16
- tomatoes** 11:19 12:11  
21:11 29:20 30:1  
190:13 231:11 317:19  
317:21 392:15 394:3  
435:12 491:9,12  
515:16
- tomorrow** 419:3,4  
542:1,1
- tonight** 240:19 247:17
- tons** 135:13,17
- tool** 102:15 112:16,20  
113:13 227:15 230:14  
271:5 331:3 341:16  
342:8 364:4
- toolbox** 144:3,7 149:5  
227:3,10 331:3 364:5  
413:22
- tools** 102:13 130:16  
132:21 143:19 144:2  
145:17 146:13 227:3  
227:10 228:5 229:19  
230:20 271:10 272:15  
323:3 413:21
- top** 48:5 136:15 232:20  
239:5 275:3 290:17  
310:6 331:22 332:22  
442:17
- topic** 44:6 45:2 117:15  
118:21 139:2 148:1  
151:18 266:3 267:15  
268:13 279:14,17  
424:1
- topically** 152:16
- topics** 4:7 152:4,6  
225:16,18 226:6  
254:19
- topping** 375:11 389:17
- torturous** 147:5
- total** 69:3 70:3 103:18  
177:9 211:20 230:9  
435:15 438:8 461:17
- totally** 69:4 72:1,5  
238:22 242:15,16
- tote** 184:5
- touch** 130:5 201:16
- touched** 388:11 511:21
- tough** 65:2 81:7 106:22  
148:3 191:12 257:11  
482:2
- toxic** 10:4 15:7 16:4  
17:1 42:9 45:5 124:10  
329:16 388:22 436:22
- toxicities** 387:15
- toxicity** 224:3,8 388:20
- TR** 162:3 296:11 300:5  
300:6 329:15 361:10  
361:19 362:1 379:1  
381:20 382:18 388:15  
392:14,16 404:10,22  
410:18
- trace** 217:3
- traceability** 207:20  
217:15 267:19
- traced** 474:5
- track** 60:22 217:11  
421:8 451:10
- tracking** 213:8 217:8,15  
218:8 219:1
- tractor** 333:7
- tractors** 475:16
- Tracy** 3:8 200:2 204:18  
204:20 205:1
- trade** 3:4,15 65:3 79:16  
100:14 117:14 118:21  
119:6 254:5 260:3,6  
260:15 268:9 345:12
- traders** 3:8 205:1,9,18  
207:22 220:1 255:18
- traditional** 95:14  
184:18 205:6,13  
479:4
- tragic** 94:20
- trail** 318:17
- trained** 136:8
- training** 118:20 144:1  
255:22
- traits** 110:13
- transactions** 39:6
- transcribe** 463:21
- transcriptionist** 391:19
- transcripts** 158:2
- transform** 82:16
- transition** 320:4 451:11
- transitioned** 229:21
- transitioning** 144:12  
501:4
- translate** 144:19
- translates** 54:8
- transloading** 268:11
- transparency** 83:10  
314:19,20 315:3,6  
505:11 507:20 510:4  
513:1 519:3
- transparent** 35:13  
82:18 103:2 264:22
- transplant** 29:12
- transplanted** 361:13
- transplants** 27:21,22  
29:10 361:16 430:22  
434:1 441:13 538:6  
540:15
- transport** 456:21
- transported** 185:21
- trapped** 345:9
- trapping** 345:6,16
- traps** 342:1 344:22  
345:15,20
- traps/barriers** 4:11  
344:12,16
- travel** 226:12 446:18
- traveling** 210:20
- trays** 173:17 175:3
- treat** 295:1 403:8
- treating** 94:3
- treatment** 217:6,12  
403:9,17
- tree** 271:5,12 272:6,20  
345:5
- trees** 36:20 191:17  
198:6 275:21 317:13  
361:16 501:18
- trellis** 200:14
- tremendous** 120:13  
393:20
- trend** 269:14
- trial** 112:7 113:5
- trailing** 112:4 421:2,4,5
- trials** 112:14 113:12  
478:12
- tribal** 513:12 514:20,20
- trichophyton** 250:16
- tried** 40:14 79:11  
413:20 496:18 497:14
- tries** 244:3
- trisodium** 168:14
- trophic** 448:6,13 450:13  
453:12 454:15,21  
455:4,10 499:13  
516:7,9,17
- trouble** 249:20 494:4
- troubled** 44:16
- troves** 537:17
- truck** 509:9
- trucked** 509:10
- true** 17:2 40:17 75:18  
159:21 201:10 316:17  
318:22 472:4
- truly** 33:3 37:20 70:18  
74:3 122:20 186:7  
243:16 315:4 483:14  
491:16
- trunks** 345:5
- trust** 54:8,12 56:12 95:4
- trustees** 507:10
- trusts** 55:1
- truth** 284:14 534:19
- try** 6:21 7:9 8:20 49:4  
65:5 67:22,22 72:16  
72:17 74:20 77:3  
200:16 259:6 291:2  
298:5 308:3 424:17  
479:18 480:22 507:1
- trying** 24:16 36:11  
60:21 61:8,10,18 79:3  
84:17 86:10 89:1,5  
93:5 114:16 171:20  
188:9,13 230:14,19  
231:20 236:4 239:21  
276:10 299:18 300:9  
330:19 377:20 413:19  
449:20 454:20 455:2  
485:20 493:18 494:2
- Tucker** 2:5 99:11  
153:15 228:8 261:5  
525:1
- tune** 80:14
- tuning** 142:1
- tunnels** 12:14,15 19:13  
28:21
- Turkey** 212:13
- turkeys** 151:2
- Turkish** 258:10 260:22  
261:20 262:22
- turn** 7:16,17 10:3  
151:20 171:15 174:6  
360:18 407:3 504:10
- turned** 212:6 254:10
- turning** 374:7
- turns** 5:18 308:13
- tweaked** 133:4
- tweaking** 424:8
- Twenty** 27:12
- twice** 213:18 466:4
- two** 8:20 24:6 25:16  
32:7 38:7 48:12,20  
49:7 57:9 62:16 70:21  
77:3 100:9 106:17  
128:16,16,22 141:12  
152:4 164:13 173:11  
181:4 184:21 205:22  
211:19 221:17 255:1  
262:3 266:8 274:15  
287:17 304:14,15,15  
308:2,9 312:12  
316:20 338:20 346:19  
348:19 360:19 361:5  
368:13 371:12 380:10  
389:7 396:15 401:9  
402:11 405:2 429:11  
468:18 475:2 481:19  
499:14 503:4,7 512:1  
512:19 518:20 519:6
- two-fold** 307:20
- two-pronged** 311:10
- two-thirds** 340:13  
530:3
- type** 44:19 58:10 81:19  
90:17 138:3 166:19  
167:1 176:9 187:3  
194:15 251:17 262:6

263:1 278:22 289:6  
492:6 528:14  
**types** 86:13 117:7,19  
151:7 168:8 180:9  
182:15 183:18 184:3  
184:13,20 195:18  
255:17 262:3 263:12  
356:5 456:17,19  
510:14  
**typically** 25:3 43:19  
132:7 169:9 172:17  
179:19 180:20 183:20  
345:3 409:9 520:5  
**typo** 352:12 353:1

---

**U**

---

**U.K** 212:4  
**U.S** 95:16 114:10  
142:15 160:20 170:17  
211:10 214:21 215:18  
216:11 218:8 232:7  
271:1 283:5 286:3  
308:9  
**UC** 174:3 311:5  
**Ukraine** 210:20  
**ultimate** 82:12 207:4  
494:8,10,18  
**ultimately** 445:18  
**uncompsted** 415:7  
**unable** 195:13 211:8  
361:19  
**unacceptable** 35:6  
**unachievable** 81:17  
**unanimous** 34:9 159:9  
242:21 245:1 352:9  
**unanimously** 369:7  
**unanticipated** 41:10  
**uncertainties** 284:18  
**uncertified** 4:6 119:4  
267:21  
**uncle** 24:11  
**unclear** 61:1  
**uncontentious** 344:21  
**uncovered** 211:17  
**uncovering** 211:7  
**undecided** 19:21  
**underestimate** 242:3  
**undergo** 417:12  
**undergoing** 411:20  
**underlying** 50:17 54:21  
273:15  
**undermine** 55:9  
**undermined** 260:7  
**undermines** 56:12  
**underneath** 331:18  
520:19  
**underscores** 130:9  
**understand** 18:19

20:20 23:22 37:18  
44:12 65:5 67:8 68:5  
73:13 79:15 112:15  
119:14 124:20 149:12  
180:8 183:8 190:11  
213:20 227:12 273:12  
293:7 294:16 315:8  
319:8 376:10 379:1  
383:18 455:2,9  
477:19 502:2,5 507:2  
509:22 535:8  
**understanding** 16:21  
34:14 42:14 87:5  
111:16 113:14,19  
124:6 128:4 178:12  
197:5 364:1 382:15  
392:8 463:2 502:20  
**understood** 232:11  
233:7  
**undertaking** 122:14  
**undertook** 403:13  
**underway** 112:13  
**undesirable** 514:18  
**unfair** 108:12  
**unfinished** 42:10  
**unforeseen** 115:15  
**unfortunate** 20:4 26:2  
143:11 200:9  
**unfortunately** 7:4 21:21  
22:22 144:17 325:6  
425:17 488:12  
**unheated** 28:21  
**unified** 226:5  
**uniform** 184:4 388:7  
**unimaginable** 284:9  
**unintended** 501:1  
**Union** 213:1 217:18  
**Union's** 230:13 486:11  
**unique** 19:14 179:22  
389:1 446:10,20,21  
457:8,22  
**uniquely** 23:21 432:1  
**unit** 63:22  
**United** 1:1 116:15 163:4  
163:7 210:13 214:9  
270:17 305:7,17  
461:8 470:20  
**universities** 176:12  
436:14  
**University** 2:12 105:10  
303:22 439:14 497:5  
499:20  
**unknowingly** 96:6  
**unknown** 135:4  
**unnatural** 496:1 498:13  
498:17  
**unnecessarily** 381:1  
**unnecessary** 402:20

**unpack** 139:10  
**unproven** 366:9 406:18  
**unquote** 151:10 155:20  
158:3  
**unreasonable** 480:2  
**unresolved** 143:18  
**unsure** 143:21  
**unsustainable** 498:9,11  
**untreated** 466:17  
468:14  
**untrue** 136:6  
**unviable** 290:11  
**up-regulating** 499:5  
**update** 116:3 153:12,14  
306:8  
**updated** 115:7 131:7  
**updates** 115:20 228:14  
303:2 305:6  
**updating** 113:6  
**uphold** 226:1  
**upper** 465:4 511:14  
**uptake** 436:15  
**uptakes** 436:16  
**urban** 9:21 173:2  
286:12 447:2 456:20  
475:4 483:1  
**urge** 58:22 59:17 82:20  
93:15 104:20 106:1  
118:15 119:15 122:10  
123:5 124:6 149:11  
255:7 315:5  
**urgently** 155:4  
**urges** 105:19 123:9  
147:13  
**USA** 400:4  
**usage** 114:1 131:17,22  
132:2 202:19  
**USAs** 104:14  
**USD** 209:10  
**USDA** 15:11 42:14 55:7  
58:17 82:15 94:9  
150:7,15 156:9,13  
200:19,20 201:7  
202:1,3 203:7,13  
204:11,12,13 208:7  
210:11 211:2 226:3  
228:9 246:6 305:16  
314:5 371:17 456:15  
460:13 492:15 512:9  
520:15  
**USDA's** 38:8 192:10  
**useful** 175:11 337:9  
387:17  
**users** 363:7  
**uses** 46:9 101:20 106:8  
166:11 173:11 202:13  
298:15 301:7,8,11,14  
301:16 365:21

**usual** 517:1  
**usually** 12:12 24:17  
127:16 144:19 163:13  
169:4 194:13 286:7  
**utility** 467:3,5  
**utilization** 317:22  
**utilize** 220:18 488:20  
**utilized** 379:19 447:6  
**utilizes** 51:13 205:12  
**utter** 318:19  
**utterly** 313:1

---

**V**

---

**vacuum** 403:2  
**validated** 508:12  
**validation** 413:9  
**Valley** 3:14 302:16  
509:8  
**valuable** 103:20 108:17  
204:15 499:6  
**value** 26:18,19 55:10  
143:16 144:20 145:8  
226:8 462:1 504:2  
**values** 41:1 144:13  
**vanilla** 100:4 102:6,8,10  
**variability** 105:8  
**variances** 154:17  
**variation** 204:4 432:11  
531:11  
**varied** 388:6  
**varietal** 114:20  
**varieties** 112:16,17  
132:9 421:2,14  
**variety** 51:4 112:8,14  
113:5,12 115:13  
132:6,19 162:15  
181:20 182:10,15  
183:12 195:8,18  
225:16 289:12 290:9  
323:2 358:20 421:3  
422:2,8 458:8  
**various** 117:6 225:17  
227:8 228:19 252:19  
306:17 389:13 435:8  
435:8 452:11  
**varroa** 155:1  
**vary** 172:13  
**varying** 194:12  
**vascular** 65:21 161:11  
450:2,10  
**vast** 390:18 491:16  
**vegetable** 8:5 72:10  
296:18 361:16 435:6  
435:11 462:6  
**vegetables** 9:20 173:6  
174:13 179:18 285:3  
475:18 497:18  
**Ventura** 290:19

**verb** 141:4  
**verifiable** 445:19  
**verification** 143:19  
 144:5 266:19 267:2  
 413:7,15  
**verified** 267:12 448:9  
**verify** 143:9 220:4  
 415:5  
**vermicompost** 174:6,7  
 174:8,22 175:6  
**vermiculture** 288:22  
**Vermont** 100:22 388:2  
 491:10  
**versatile** 249:18  
**versatility** 249:13  
**versify** 203:5  
**version** 445:11 449:18  
 512:9  
**versus** 62:17 111:13  
 163:14 222:11 231:15  
 293:2 389:9 469:8  
 526:11  
**vertebrates** 449:7  
**vertical** 173:2  
**vessel** 401:16,19  
 537:12,16  
**vested** 79:14  
**Vetericyn** 251:22  
**veterinarian** 248:15  
 251:5  
**veterinarians** 251:6  
**veterinaries** 251:8  
**viable** 223:6 275:14  
 343:1 382:11 391:10  
 404:16,19  
**Vice** 1:12 99:18 254:3  
**view** 19:16 27:11 51:17  
 120:21 213:7 394:4  
 427:16,17,18,19  
 433:7 442:3,16,17,20  
 442:22 444:14 445:10  
 445:13 446:7,9 448:2  
 448:14 462:15 486:13  
 495:11,15 496:5  
 497:20 509:15 519:22  
 535:3  
**views** 26:12 117:17  
 232:4 490:9 519:6  
**vigor** 361:18  
**village** 513:6,7  
**vines** 435:15  
**Vineyards** 3:4 67:15  
**violation** 313:10  
**Virginia** 495:5  
**virtually** 288:10 402:10  
**viruses** 249:17  
**viscosity** 179:21 181:5  
 181:14

**vision** 9:12 144:17  
 145:10 279:19 459:22  
**visionary** 233:22  
**visit** 478:3  
**visited** 27:18 478:1  
 496:10  
**visiting** 391:3 486:16  
**vital** 102:4 271:7 272:15  
**vitality** 294:7  
**vitamin** 4:15,15,15  
 117:1 361:12,17,21  
 362:2 366:5  
**vitamins** 357:16 360:15  
 361:1 367:12,14  
**vivo** 251:9 361:21  
**voice** 54:15 460:11  
 505:15,18  
**voiced** 262:15  
**voices** 116:17  
**volatile** 401:17  
**volume** 177:12  
**volunteer** 46:18 53:5  
**volunteered** 504:10  
**volunteers** 147:6  
**voted** 78:5 182:21  
 227:12 292:10 293:8  
 336:2 358:17,21  
 365:14 369:7 371:18  
 534:21  
**votes** 131:3 162:17  
 327:3 335:4 340:8,13  
 340:14 344:9 346:17  
 349:21 351:4 357:12  
 360:12 364:10 367:8  
 368:11 370:17 373:16  
 385:10 386:10 397:17  
 399:1 417:3 418:16  
 426:6 427:3 523:19  
 523:21 526:16 528:18  
 532:7 533:13 536:22  
 539:7 541:14  
**voting** 257:16 324:7,18  
 325:10 326:9 327:7  
 334:10 339:14 343:16  
 346:2 349:1,7 350:11  
 353:6 356:18,19  
 359:17 366:15 367:18  
 370:1 373:1 378:6  
 385:14 395:15 397:2  
 398:8 416:10 418:1  
 426:8 521:16 523:3  
 531:4,7 533:7,19  
 534:6 536:7 538:13  
 540:21

---

**W**


---

**wage** 76:18  
**wait** 414:7 422:15

455:19 541:17  
**waiting** 104:13,18  
 142:21 143:5 292:6  
 403:22 441:20  
**waits** 55:19  
**Walden** 3:12 193:3  
 196:3,6,6 198:22  
 199:4,22  
**walk** 52:19 248:1,1  
 471:7  
**Walker** 3:12 138:12  
 142:10,13,14 145:22  
 146:10  
**walking** 9:13 56:19  
**walls** 486:17  
**Walnut** 244:20  
**Wanda** 2:20 179:10  
 180:12 181:21 182:3  
 182:4,7  
**wanted** 62:11 106:15  
 129:11 141:19 145:14  
 145:18 240:18 247:2  
 294:22,22 299:5,8  
 303:19 305:5 321:6  
 330:1 339:2 380:2  
 399:9 400:17 407:3  
 412:11 420:2,6,11  
 428:9 442:4 455:21  
 459:7 464:22 480:22  
 480:22 507:17 517:7  
 526:1,6  
**wanting** 73:18 204:14  
 248:21 306:10  
**wants** 52:11 72:17  
 381:16 382:3  
**war** 59:20  
**warehouse** 318:2  
 454:14  
**warm** 30:13 471:6,7  
**warned** 459:11  
**warning** 7:7  
**warns** 5:16  
**warrant** 396:7  
**washed** 499:1  
**Washington** 55:20 57:4  
 57:8 105:10 211:7,13  
 212:9 218:16 269:20  
 270:2,17 314:8  
 318:12  
**wasn't** 28:9 35:15 96:22  
 232:20 243:15 296:20  
 307:13 310:1 338:16  
 342:18 364:19 381:12  
 383:2 384:22,22  
 387:3,9 388:16 530:7  
**waste** 22:22 38:5  
 173:13,22 202:16  
 206:7,7 240:20

401:11,12,15,22  
 432:22  
**wasteful** 480:3  
**wastewater** 532:17  
**watch** 36:21  
**watching** 314:21  
**water** 1:9 19:7 36:21  
 37:7 51:3,7 88:8,9  
 141:21 154:15 169:2  
 171:14 173:8,12,19  
 191:22 202:16 205:13  
 206:21 224:12 253:11  
 272:3,15 273:19  
 317:8,16,17 321:16  
 321:16,19 329:8  
 351:12 432:22 433:3  
 433:4 439:21 452:17  
 465:9 466:11,14  
 468:12 478:19 498:16  
 503:1,5,6,10,13,17  
 518:7 532:20,20  
 539:12  
**water-based** 467:18  
 469:9  
**watered** 96:7 154:13  
**waters** 224:15,15  
**waterways** 329:18  
**way** 9:12,15 13:12  
 20:17 24:8 26:6 44:21  
 46:8,13 48:8,12,20  
 49:7 52:3,6 76:3  
 95:12,18 98:4 113:2  
 113:21 118:8,16  
 127:10 128:6 132:16  
 152:17 174:12 176:1  
 188:17 200:17 201:2  
 207:21 209:19 214:3  
 214:8 217:9 219:9  
 235:3 246:6 256:14  
 259:1 260:9 261:2  
 262:13 284:10 285:13  
 287:21 296:1,3  
 315:22 316:12 336:2  
 345:15 355:4 362:11  
 387:9 394:21 413:14  
 434:11 436:1 437:10  
 438:22 439:1 444:21  
 481:10 490:13 492:22  
 499:7 503:8 504:21  
 505:13 506:12 509:1  
 509:16,20 510:20  
 513:15,22 515:6  
 516:18 527:14  
**ways** 47:13 115:18  
 122:8 139:5 181:12  
 267:9 270:15 328:13  
 355:22 387:8 457:19  
 461:21 498:18

**Weakley** 243:6  
**weaknesses** 55:11  
**wealthy** 154:12  
**weapons** 316:18  
**wearing** 68:10  
**weather** 234:13 285:6  
**web** 10:10 37:17 158:5  
**webinar** 336:17 376:15  
 376:16 384:20 459:18  
**webinars** 283:15  
**website** 113:11 374:14  
 400:15  
**WEDNESDAY** 1:7  
**weed** 110:15 223:6  
 328:9 332:20 333:12  
 335:12  
**weeding** 223:9  
**weeds** 332:18  
**week** 19:11 98:21 108:4  
 310:21  
**weekend** 311:18  
**weeks** 139:20 191:20  
 215:7  
**weigh** 104:4 258:22  
 260:10  
**weighed** 264:17  
**weight** 277:15 436:3  
**Weisman** 3:13 93:11  
 99:7,10,12  
**Welch** 472:18  
**welcome** 80:19 83:3  
 158:20 268:5  
**welfare** 150:1,13,16  
 151:20 152:2,13  
 281:18  
**well-articulated** 283:12  
**well-regulated** 316:15  
**Welsch** 155:18  
**went** 27:18 36:15  
 158:17 282:11 292:4  
 298:12 419:7 429:4  
 434:9 465:2 517:12  
 525:6 542:7  
**weren't** 5:12 26:9 69:8  
 154:11 165:10 235:8  
 243:15 310:6 342:20  
 383:10 517:13  
**west** 332:13 333:4  
 460:7  
**Westbridge** 2:19 221:6  
 221:10,16  
**western** 78:16 230:13  
**wetlands** 466:16  
**whack** 332:20  
**whatsoever** 88:16  
 319:19  
**whey** 258:9 260:21  
 262:2

**whichever** 117:13  
**white** 184:1,10  
**who've** 201:2  
**Wholesale** 2:14  
**wholesaler** 120:10  
**Wholesaler's** 116:13  
**wholly-owned** 286:18  
**Whoriskey** 211:13,21  
 214:1 215:8  
**wide** 90:19 182:10  
 195:8,18 249:22  
 253:5 290:9,20  
 344:22 406:4  
**widely** 102:12 134:19  
 250:1 272:9  
**wider** 195:20  
**widespread** 251:16  
**wild** 57:7 106:20 107:11  
 136:20 137:3 198:21  
 199:1,18 309:10  
**wildlife** 465:13,14,16  
 466:3  
**William** 243:7 471:16  
**willing** 11:11 55:2 70:1  
 234:2 378:20 511:19  
**win** 248:15 297:21  
**wind** 503:22  
**wine** 73:16,18 76:10  
 198:10 316:11  
**winemaker** 67:14  
**wines** 76:21  
**winners** 191:14 497:22  
**winter** 30:17 88:21  
 136:1 508:17  
**wish** 261:7 283:15  
 510:12 519:20  
**wit** 316:5  
**withdraw** 293:5  
**withdrawal** 293:3  
**withdrew** 300:15  
**withholding** 417:18  
**withstanding** 489:9  
**Wittenberg** 244:19  
**women** 69:11  
**wonder** 13:14 460:12  
 464:13 514:19  
**wondered** 87:9 112:8  
**wonderful** 241:22 476:9  
 476:9 504:4  
**wondering** 43:16 75:14  
 136:19 152:12 198:19  
 214:16 290:3 389:17  
 535:4,7  
**wood** 20:22,22  
**word** 15:14 20:3 25:8  
 62:9,10 148:17  
 216:18,19 310:8  
 464:18 471:22 474:17

495:22 520:21 521:8  
**wording** 198:19,20  
 421:2 430:17  
**words** 35:8,17 38:5  
 75:2 110:17 348:11  
 417:12 472:2 473:20  
 484:8  
**wordsmithing** 422:5  
**worked** 30:10 31:18,22  
 95:5 176:11 389:10  
 493:17 498:3 538:17  
**workers** 94:4 287:4  
**workforce** 39:11  
**working** 19:9,10 20:13  
 20:20 22:6 23:11,19  
 23:20,20 46:4,8,14,22  
 48:14 53:10 60:3  
 83:15 94:1 110:12  
 112:10 113:4,16,16  
 129:17 138:17 152:7  
 164:7 173:14 176:10  
 178:21 183:16 242:5  
 256:1 267:18 304:3  
 309:9 320:4 387:14  
 414:14 469:12 479:20  
 487:2  
**workload** 41:4 46:18  
**work** 139:16 381:1 384:2  
 385:3  
**works** 20:20 26:14 37:2  
 52:9 107:21 130:2  
 137:22 186:13 234:11  
 242:4 281:22 305:12  
 428:8 439:1 479:11  
**workshops** 464:4  
**workstation** 323:4  
**world** 39:3 68:20 83:14  
 97:22 127:15 128:14  
 138:3 202:19,21  
 213:16 256:17 284:1  
 284:7,16,20 471:3,4  
 474:7 496:12 500:4  
**world's** 133:17  
**worldwide** 137:12,16  
 461:15,18  
**worms** 174:5  
**worried** 235:17  
**worry** 15:17 244:11  
**worrying** 218:19 315:7  
**wort** 251:4  
**worth** 90:7 525:20  
**wouldn't** 21:13 31:2  
 209:22 231:2 236:6  
 331:19 392:12  
**wound** 250:6  
**wounds** 251:1 252:9  
 253:6  
**woven** 464:18

**Wow** 486:20  
**wrap** 11:7,8 261:10  
 415:13 419:15 496:19  
 496:20  
**wrestle** 28:8  
**writ** 52:3  
**write** 471:13  
**writers** 233:7  
**writing** 254:14  
**written** 47:5 114:6  
 116:3,4 118:7,13  
 119:10,21 131:3,5,6  
 137:9 139:4 140:9  
 142:16 147:18 166:9  
 168:3 196:13 221:14  
 223:5 229:3 270:4  
 283:13 294:19,20  
 295:2 297:13 376:14  
 376:19 377:14,17,18  
 384:20 454:16 455:6  
 460:2 472:19 485:2  
 490:12 530:13,14  
**wrong** 30:9 31:3 79:3  
 83:19 239:22 304:20  
 330:10 365:7  
**wrote** 32:20 34:10  
 145:3 211:1 400:20  
**Wyard** 3:15 248:11  
 253:21,22 254:3  
 258:8,12 262:12  
 263:21 264:4,13,21  
 265:6,9

---

**X**


---

X 69:9

---

**Y**


---

**Yakima** 269:20  
**Yankees** 474:17  
**yard** 506:19  
**year** 12:13 22:7 28:15  
 36:16,16 55:16 67:17  
 75:13 98:20 104:12  
 112:21,21 114:12,18  
 173:4 218:18 225:13  
 235:6 269:10 274:17  
 288:12,13 302:21  
 306:8 336:11,11  
 400:12 437:8 440:8,8  
 461:12 469:22 475:1  
 475:3 478:17 497:8  
 513:20  
**year-round** 9:20 28:18  
 174:14 440:10 457:7  
**year-to-year** 421:12  
**yearly** 149:1 217:7  
**years** 8:19 12:12 18:14  
 18:17 19:2,5,9 20:12

20:21 21:2 27:4,5,12  
 29:1 30:10 31:19 36:9  
 40:14 48:1 51:12  
 53:20 67:20 69:9  
 70:22 72:3 91:22  
 100:8 113:6 137:21  
 138:7 168:7 173:6  
 176:10 178:14 191:18  
 199:12 210:21 225:16  
 229:20 233:10 234:5  
 236:3 266:7 277:19  
 280:15,22 283:19  
 284:8 303:1 312:21  
 338:20 339:3 391:7  
 425:1 442:12 467:5  
 470:17 475:2 477:7  
 479:20 481:19 489:16  
 497:10,10 501:4  
 512:1  
**yeast** 249:17  
**yellow** 5:18  
**yesterday** 5:12 7:9  
 11:16 21:9 22:11 28:6  
 33:17 43:21 44:5  
 51:22 54:10 62:15  
 75:7 122:13 128:20  
 144:21 153:13 212:2  
 212:20 213:6 220:12  
 260:2 261:5 314:16  
 323:16 511:1  
**yield** 24:19 309:13  
 435:12,13  
**yielding** 34:21  
**yields** 364:18 457:7  
**yogurt** 183:21 184:1,1,9  
**York** 495:6 498:2,4  
**young** 24:10 31:7,16  
 208:19 284:3,10,15  
 286:3,9 475:4,15  
 497:4  
**Youngblood** 3:16  
 116:10 121:13,16,17  
 125:5,8,10

---

**Z**


---

**zero** 88:19 173:14  
 223:19 304:17 326:5  
 327:4 328:2 335:5  
 340:9 344:10 346:18  
 349:22,22,22 351:5  
 354:3 357:13 360:13  
 367:9 368:12 370:18  
 373:17 397:18 399:2  
 417:4 418:17 427:4  
 532:8  
**zinc** 4:14 357:19 358:9  
 359:9  
**zone** 191:10

**Zurich** 274:3

---

**0**


---

**0.005** 276:17  
**0.007** 276:18

---

**1**


---

**1,000** 8:8 436:3  
**1,000-kilo** 184:5  
**1:01** 282:11  
**10** 88:10,19 113:5  
 154:11 175:2 199:12  
 205:13 305:12 461:1  
 461:2 497:15 499:13  
**10-state** 138:20  
**10-year** 143:5  
**10,000** 135:17 439:15  
**10:30** 129:17  
**100** 27:4 36:15 60:11,17  
 61:5 62:2 87:20  
 104:22 105:7 205:11  
 210:16 214:21 236:19  
 272:6 278:13,16  
 279:6,10 305:18  
 336:18 337:4 338:10  
 410:11 421:18 435:14  
**100-acre** 389:19  
**100,000** 313:15,19  
**101** 401:11,21 405:12  
**105** 36:16  
**108** 68:15 72:20 87:16  
**110** 162:2  
**12** 329:2 374:11,13  
 402:18 479:20 496:12  
**120** 410:2  
**1200** 138:19  
**121** 461:17  
**13** 275:1 280:21  
**130** 87:21  
**131** 405:15  
**14** 305:17 335:5 349:22  
 532:8  
**14,000** 174:1 270:21  
**14,185** 460:22  
**140** 311:16  
**14th** 150:10 228:10  
**15** 18:6 20:12 31:19  
 34:10 76:18 176:10  
 249:9 250:15 276:13  
 276:14 277:12,19  
 280:21 305:12 326:5  
 327:4 328:2 340:9  
 344:10 346:18 351:5  
 354:3 357:13 360:13  
 365:11 368:12 370:18  
 373:17 399:2 418:17  
**150** 402:16  
**16** 77:21 78:7

**160** 27:5  
**1600** 474:5  
**17** 210:21  
**177** 254:9  
**177.5** 254:9  
**1787** 231:21  
**179** 461:2  
**18** 470:22  
**180** 435:16 460:20  
 461:4  
**1807** 471:15  
**1852** 474:15  
**19** 210:14  
**1975** 67:18 518:14  
**1990** 501:3  
**1995** 32:19 33:13 34:5  
 155:20 472:11 517:8  
**1996** 242:12

---

**2**


---

**2** 135:18 282:7 347:4  
 448:22 497:1,11  
**2,4-D** 394:17  
**2,400** 48:5,17  
**2.22** 497:15  
**2.6** 277:5  
**2.8** 306:1  
**2:03** 282:12  
**2:59** 490:13  
**20** 19:9 29:1 31:21  
 59:11 86:8 100:7  
 174:5 248:1 276:14  
 276:15,22 277:1,12  
 278:5 280:15 304:16  
 305:3,11,20 311:2  
 399:14 431:5 433:16  
 434:5,22 436:12  
 441:4 499:14 537:21  
 539:19 540:6  
**20,000** 286:12 310:20  
**200** 149:1  
**2000** 142:15 472:21  
**2001** 160:3  
**2002** 158:1,7,17 246:8  
 443:8  
**2004** 19:12 443:8  
**2005** 99:16 156:7,14  
 158:16  
**2009** 443:8  
**2010** 53:18 60:9 61:2  
 65:19 91:6,12,21 93:4  
 99:16 354:16 358:12  
 428:10 429:14 430:17  
 445:5,11 447:5  
 449:18 453:9 454:2  
 487:14,15 489:10  
 490:6 534:5,8,8  
 535:13  
**2011** 207:12 322:5  
 347:16  
**2012** 335:19 351:14  
**2013** 110:2 208:20  
**2014** 443:8  
**2015** 53:18 100:22  
 124:9 328:16 335:19  
 355:13 361:3,10  
 374:11  
**2016** 135:17 155:15  
 335:19 400:3 428:18  
 429:9 443:8 460:18  
 461:4,14  
**2017** 1:5,7 122:13  
 228:10 258:2,8  
 260:12 303:4,17  
 374:13,22  
**2018** 113:6 292:1  
**2019** 4:8 256:21 320:20  
 321:8  
**2022** 365:9,11,17  
**205** 30:5  
**205.105** 106:3 450:15  
 451:3  
**205.2** 335:14 339:9  
**205.202(b)** 451:9  
**205.202B** 104:12  
**205.203** 126:1 400:5  
 406:15 451:18  
**205.203(a)** 451:15  
**205.203(c)** 417:10  
**205.203(c)(2)** 405:6,21  
**205.209** 104:9 450:12  
 450:19  
**205.600(b)** 366:7  
**205.601** 321:9 328:9  
 335:12 347:4 374:17  
 400:7  
**205.601(b)** 334:7  
**205.601(e)** 343:10  
 345:20  
**205.601(i)** 349:3 350:8  
**205.601(j)** 353:6 356:15  
 359:14 366:5 367:14  
**205.601(k)(2)** 398:2  
**205.602** 368:14,20  
 369:19 371:1 372:19  
**206** 451:18  
**20s** 284:4  
**20th** 225:13 228:17  
**21** 38:8 401:22  
**22** 425:1 460:22  
**23** 461:1  
**24** 185:18 249:11  
**245** 1:9  
**24d** 48:3  
**25** 72:3 135:21 233:10  
 234:5 305:18 393:17

255 4:5,6  
 26 496:13  
 27 501:3  
 27th 470:1  
 28 69:11 461:2 490:13

---

**3**

---

3 207:13 340:22 347:12  
 351:10 449:1  
 3,000 253:2  
 3.5 180:20 305:19  
 30 18:16 19:5 31:21  
 36:9 49:14 69:19  
 162:3 254:12 284:8  
 309:15 402:3 435:19  
 436:5 497:10  
 30-ton 435:13  
 300 254:13 303:8  
 303 197:11  
 307B 197:8  
 30s 284:4  
 310 497:5  
 320 4:9  
 328 4:9  
 33 69:19  
 335 4:10  
 34 283:19 328:22  
 340 4:10  
 344 4:11  
 346 4:11,12  
 35 402:3  
 350 4:12  
 3500 135:14 306:3  
 354 4:13  
 357 4:14  
 360 4:15  
 361 4:15  
 370 4:16  
 374 4:17  
 38,000 475:18  
 399 4:18

---

**4**

---

4 4:1 76:22 417:14  
 449:4,6 461:14  
 4,000 48:2  
 4,260 254:8  
 4:15 418:18 419:7  
 4:25 418:19  
 4:29 419:8  
 40 19:2 73:17 216:7  
 284:8 309:16 351:19  
 391:6  
 40- 137:20 389:19  
 400 275:17 303:15  
 410 497:6  
 420 4:18  
 427 4:19

428 4:20  
 44 254:15  
 450 211:19  
 456 4:21  
 45th 67:17  
 46 328:21  
 47 173:6  
 48 19:11 313:19  
 4800 138:16  
 49 461:2

---

**5**

---

5 400:3 449:7  
 50 41:9 59:12 86:9  
 137:21 225:11 351:19  
 431:4 433:18 434:6  
 435:2 436:12 441:6  
 453:13 461:2 497:10  
 505:21 538:1 539:21  
 540:8  
 50/20 190:1,4  
 500,000 135:13 211:19  
 5006 403:8  
 5029 265:17  
 520th 513:19  
 53 484:7  
 542 4:22  
 55 69:12

---

**6**

---

6 358:2  
 6.5 150:5  
 6:20 519:14  
 6:43 542:7  
 60 69:15  
 60.8 252:3  
 605A 100:13,17 101:5  
 67 254:15

---

**7**

---

7 366:7 497:1,11  
 7's 313:14  
 7,000 210:17  
 7:00 247:19  
 70 80:16 216:6 303:13  
 700,000 305:20  
 72 240:13,13  
 73 460:19 461:3,6  
 462:15  
 75 305:22  
 76 240:12

---

**8**

---

8 360:22  
 8,000 173:21  
 8:30 1:9 542:1  
 8:34 5:2  
 80 174:2 435:15,21

800 485:19 513:9  
 82 498:7,9

---

**9**

---

9 344:16  
 90 36:15 149:3 270:22  
 410:2  
 90s 232:20  
 95 177:11 274:17 341:4  
 344:18 423:22  
 96 245:6

C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Fall 2017 Meeting

Before: USDA/NOSB

Date: 11-01-17

Place: Jacksonville, FL

was duly recorded and accurately transcribed under  
my direction; further, that said transcript is a  
true and accurate record of the proceedings.



-----  
Court Reporter

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

UNITED STATES DEPARTMENT OF AGRICULTURE

+ + + + +

NATIONAL ORGANIC STANDARDS BOARD

+ + + + +

FALL 2017 MEETING

+ + + + +

THURSDAY,  
NOVEMBER 2, 2017

The Board met in Florida Ballrooms A, B & C of the Omni Jacksonville Hotel, 245 Water Street, Jacksonville, Florida at 8:30 a.m., Tom Chapman, Chair, presiding.

PRESENT

TOM CHAPMAN, Chair  
ASHLEY SWAFFAR, Vice Chair  
JESSE BUIE, Secretary  
SUE BAIRD  
HARRIET BEHAR  
ASA BRADMAN  
A-DAE BRIONES  
LISA DE LIMA  
STEVE ELA  
DAVE MORTENSEN  
JOELLE MOSSO  
EMILY OAKLEY  
SCOTT RICE  
DAN SEITZ  
FRANCIS THICKE

**STAFF PRESENT**

**MICHELLE ARSENAULT, NOSB Advisory Board**

**Specialist, National Organic Program**

**DR. LISA BRINES, Ph.D., National List Manager,**

**National Organic Program**

**DR. PAUL LEWIS, Ph.D., Director, Standards**

**Division, National Organic Program**

**DEVON PATTILLO, Materials Specialist, National**

**Organic Program**

**DR. JENNIFER TUCKER, Ph.D., Associate Deputy**

**Administrator, National Organic Program;**

**Designated Federal Official**

C-O-N-T-E-N-T-S

Discussion document on field and greenhouse container production . . . . . 8

Proposal on Eliminating the incentive to convert native ecosystems to organic production. . . . .23

Livestock Subcommittee

2019 Sunset Substances - review

Chlorhexidine. . . . .84

Chlorine materials (calcium hypochlorite, chlorine dioxide, sodium hypochlorite) . . . . .87

Glucose. . . . .90

Oxytocin . . . . .92

Tolazoline . . . . .99

Copper sulfate . . . . .103

Lidocaine. . . . .109

Procaine . . . . .113

Proposal:

Sulfur - petitioned. . . . .124

Hypochlorous acid - petitioned . . . . .135

Clarifying "emergency" for use of synthetic parasiticides in organic livestock production . . . . .141

Handling Subcommittee

2019 Sunset Substances - review

Attapulgate. . . . .147

Bentonite. . . . .150

Diatomaceous earth . . . . .152

Nitrogen . . . . .154

Sodium carbonate . . . . .156

Acidified sodium chlorite. . . . .158

Carbon dioxide . . . . .160

Chlorine Materials (calcium hypochlorite, chlorine dioxide, sodium hypochlorite) . . . . .162

Magnesium chlorite . . . . .173

Potassium acid tartrate. . . . .176

Sodium phosphates. . . . .178

Casings. . . . .191

Konjac flour . . . . .201

Handling Subcommittee (cont.)

Pectin (non-amidated forms only) . . . . .	210
Proposal:	
Potassium acid tartrate reclassification . . . . .	217
Discussion Document: Marine materials. . . . .	219
Verbal Update:	
Tocopherols - Annotation change at 205.605(b) of the National List. . . . .	224
Tocopherols - Additional listing at 205.605(b) of the National List. . . . .	224
Ancillary substances used in cellulose . . . . .	226

Materials Subcommittee

Proposal:	
2017 Research Priorities . . . . .	229
Excluded Methods Terminology . . . . .	243
Discussion Document: Non-GMO Organic Seed Integrity . . . . .	261
Deferred proposals/Final Votes . . . . .	291
Subcommittee Work Agenda . . . . .	292
Recognition of Outgoing Member . . . . .	318
Officer Elections. . . . .	318
Other Business/Closing Remarks . . . . .	327
Adjourn. . . . .	330

## P-R-O-C-E-E-D-I-N-G-S

8:33 a.m.

CHAIRMAN CHAPMAN: Good morning,  
everyone. We're going to come to order.

So we'll begin this morning in a  
moment, back with the Crops Committee onto the  
CACS Committee, and then we'll continue on with  
what's already listed on the Thursday portion of  
the agenda.

Before we get started, we had a fairly  
important vote last night, and I just wanted to  
take a moment and ask the program if they could  
give some guidance on what they see as the next  
steps?

DR. TUCKER: First, good morning,  
everybody. Good to see everyone.

So, first, the Agricultural Marketing  
Service, the National Organic Program thanks the  
Board for your really, really, very thoughtful  
discussion on hydroponics, aquaponics, and  
aeroponics.

I really, truly appreciate your work

1 on the topic.

2 So just as a quick review, last night,  
3 the Board passed a proposal to prohibit  
4 aeroponics in organic production.

5 The Board did not come to agreement on  
6 the certification of hydroponics or aquaponic  
7 production systems.

8 So certification of all three types of  
9 operations remains allowed while USDA considers  
10 the Board's work on this topic.

11 In terms of next steps, we'll share  
12 the discussion that happened here back with our  
13 leadership team, and then we'll come back to the  
14 NOSB with their thoughts.

15 CHAIRMAN CHAPMAN: Thank you. With  
16 that, I'll hand it over to Francis to continue on  
17 with the Crops Subcommittee.

18 DR. THICKE: Thank you, Tom. We have  
19 just two, I think relatively brief, items to do.

20 The first is a discussion document on  
21 field and greenhouse container production, and  
22 Harriet is going to lead that discussion.

1 MS. BEHAR: Good morning.

2 So there was this discussion document  
3 to deal with specific areas where field and  
4 greenhouse production is done in containers.

5 We, unfortunately, did not get a lot  
6 of public comment on this.

7 However, we do have -- there was some  
8 comment on the artificial light, but not a lot of  
9 detail on why, more or less, or why different  
10 spectrums.

11 But we do have an open docket, so I  
12 really do encourage people to take a look at that  
13 discussion document again.

14 We are going to move forward with  
15 dealing with this issue, and perhaps, there might  
16 be some more items that will come forward for  
17 containers.

18 Because we knew this was just a start,  
19 depending on how the hydroponic vote went.

20 So, now that we are living with more  
21 containers, we'll be looking at container  
22 production in a little bit more detail.

1           So I encourage you to look at those  
2 questions again, and really do help us with these  
3 specific issues, and if you have other issues  
4 that you think we should address in container  
5 production, to bring it to our attention.

6           DR. THICKE: Thank you, Harriet. And  
7 the last item for the Crops Subcommittee is --

8           CHAIRMAN CHAPMAN: I had some  
9 questions.

10          DR. THICKE: Oh, I'm sorry. Go ahead.

11          CHAIRMAN CHAPMAN: So, when I was  
12 reading the public comment, it looked like there  
13 was a discussion on artificial -- I mean I'm  
14 struggling with this issue myself, to come to  
15 terms with what direction to go on.

16                 Because some commenters mentioned  
17 about using specific spectrums of light to  
18 conserve energy, and other commenters talked  
19 about using full spectrums to mimic sunlight as  
20 closely as possible.

21                 I was just curious, of those who have  
22 an opinion on the Board on this matter, if anyone

1 has kind of a thought of, you know, it's being  
2 pulled in two different directions?

3 MS. BEHAR: Well, yes, I guess I would  
4 be interested in hearing from the rest of the --  
5 but I felt that there was not, to me, enough kind  
6 of background to help us weigh those different --  
7 it was more I need this.

8 But not how does it fit into a system.  
9 That's what I'm kind of looking at more, because  
10 we're looking at standards, perhaps, for a system  
11 of production.

12 CHAIRMAN CHAPMAN: Dave has a comment.

13 MR. MORTENSEN: Harriet, now that this  
14 is going to become more important, we will need  
15 to spend a lot more time on lighting.

16 And we will need to spend a lot more  
17 time on thinking about the carbon footprint,  
18 since it's very clear that we're moving in a  
19 direction here, at least with these systems,  
20 where we're looking at a very energy-intensive  
21 production system.

22 The lighting will matter a lot, the

1 quality of lighting matters a lot, in terms of  
2 the energy consumption.

3 We just had a very interesting speaker  
4 at Penn State this week, who's very excited about  
5 growing food on Mars.

6 He's been studying light quality and  
7 energy efficiency because he's concerned that  
8 we're going to run out of capacity to grow food  
9 on Earth, because of our behavior.

10 So I've got a ton of information about  
11 light quality and light energy efficiency and  
12 use, that will help inform this.

13 I've spent a good bit of time  
14 reviewing it over the last couple weeks.

15 DR. THICKE: Lisa has a comment?

16 MS. DE LIMA: I agree with Tom.

17 But also, taking a step further back  
18 from that perspective and just asking about light  
19 in general, not just what type of light, full  
20 spectrum light, red or green -- blue, sorry --  
21 but is lighting going to be allowed?

22 To what degree?

1                   We saw a lot of different slides and  
2 pictures over the last few meetings, and I'm  
3 definitely not comfortable with the warehouses  
4 that only have artificial light and the plants  
5 stacked.

6                   And we saw other speakers with  
7 sunlight-lit hydroponic systems; I am comfortable  
8 with those, so taking a step back and looking at  
9 it from that perspective as well.

10                  DR. THICKE: Any other comments from  
11 the Board? Emily?

12                  MS. OAKLEY: Yes, I would echo Lisa's  
13 comments that we should be discussing not  
14 necessarily what kinds, but if any should be  
15 allowed.

16                  So, I definitely have reservations  
17 about any artificial light at all, probably not a  
18 big surprise there.

19                  But we do have some information that  
20 Zea left us with before she left the Board that  
21 could be a good jumping-off point first.

22                  DR. THICKE: And I'd like to add that

1 I think that we could look at the other  
2 countries, like the European Union.

3 What they're looking at, some  
4 countries are suggesting that, light could be  
5 used to maybe mimic natural daylight, only  
6 natural daylight cycles.

7 Joelle?

8 MS. MOSSO: I just want to echo,  
9 basically, what Lisa and all of you have said, as  
10 well as request that the public send what is  
11 being used currently.

12 I think that would be at least helpful  
13 for us all to know what is being used. But I  
14 definitely echo that it's a question of if, and  
15 then if, what kind?

16 DR. THICKE: Tom?

17 CHAIRMAN CHAPMAN: And then on the  
18 other one, the synthetic mulches, one of the  
19 comments that I found most relevant was, you  
20 know, how if these standards would be set for in-  
21 ground, not in an enclosure as well.

22 So, that's I guess the other one to

1 keep in mind and think about.

2 I think most people on the disposal  
3 are actually, from the comments I read, was  
4 fairly uniform in agreement on how to approach  
5 that one.

6 MS. BEHAR: It's called field and  
7 greenhouse container production.

8 So that's the other -- of course,  
9 artificial light out in the field, you're not  
10 going to find that too much.

11 But the question of specifically  
12 should the use of artificial light be limited to  
13 a specific number of hours per day, and there  
14 were people who said zero.

15 So there was the option there for no  
16 artificial light, all up to whatever.

17 CHAIRMAN CHAPMAN: So when you say  
18 field production, you mean full in the field and  
19 in the ground, not in the container?

20 MS. BEHAR: No, I mean this is for  
21 containers that are sitting on top of landscape -  
22 -

1                   CHAIRMAN CHAPMAN: Some of the  
2                   comments said that the synthetic mulch  
3                   requirements, whatever they are when they get  
4                   rolled out for container production, should be  
5                   the same for in-the-ground production as well.

6                   MS. BEHAR: Yes, so it might be that  
7                   we might eventually do a rule change or have  
8                   something different because, currently, it says  
9                   synthetic mulches must be removed at the end of  
10                  the growing or harvest season.

11                  And so if someone's growing  
12                  blueberries and the mulch is under that, and they  
13                  don't remove those blueberries in the containers  
14                  for ten years, that mulch stays there for -- it's  
15                  not the end of the growing.

16                  It's the harvest season, right, that's  
17                  ten years.

18                  CHAIRMAN CHAPMAN: Yes, I understand  
19                  that's also a practice in field crops right now  
20                  as well, and orchards.

21                  MS. BEHAR: Yes, I agree. It should  
22                  be consistent.

1 DR. THICKE: Steve has a comment.

2 MR. ELA: Yes, that's been a dicey  
3 one, lavender, perennial crops.

4 I mean, we've gone around with  
5 certifiers of whether you have to pull it back,  
6 if you're using a more permanent, like a woven  
7 shape cloth, and there were non-compliance  
8 notices issued.

9 The USDA got to deal with that.

10 For the most part, I think they've  
11 been resolved in favor of if it's a perennial  
12 crop, you get to leave it on until the crop is  
13 done, but for a fruit tree, it could be 20 years.

14 And honestly, that fabric is not in  
15 good shape after that many years. So, there does  
16 need to be a little more clarification on that.

17 And just like they said, if you're in  
18 a container, what is the end of production?

19 Is it the end of when that container,  
20 finally, is not used, or the crop in that  
21 container is done?

22 So there's some nuances that

1 definitely need to be resolved in that.

2 DR. SEITZ: I just wanted to add the  
3 classic sort of answer that we have on this is it  
4 depends.

5 And when we go out and see different  
6 sites, whether it's blueberries or lavender or  
7 what have you, the inspector's looking at that  
8 cloth, and they're seeing if it's degrading or  
9 getting there.

10 And that's a conversation with the  
11 operation, but it is something considered.

12 So again, important to consider for  
13 all types of production.

14 MS. BEHAR: And I believe in the  
15 discussion document, there are some mitigation  
16 measures for preventing quick breakdown, like  
17 putting down wood chips or other mulches.

18 Because there's more than just the  
19 covering of the land.

20 There could be runoff issues and  
21 heating, and whatever.

22 So there's a lot to look at in

1 especially those longer, not the thin films, but  
2 the woven cloths which can withstand multiple  
3 years.

4 DR. THICKE: Steve?

5 MR. ELA: I have one other concern,  
6 it's sort of related to that, but especially in  
7 the container production, where we've heard  
8 prunings being incorporated in the soil.

9 I just have to say I'd like more  
10 input, because if you're incorporating things in  
11 the soil but your plant's not in the soil -- I  
12 mean you're on a container, but you're  
13 incorporating things in the soil -- you've got  
14 kind of two different systems there that aren't  
15 linked.

16 And so if you're incorporating these  
17 things in the soil, where is it going? And it  
18 almost becomes then a nutrient sink that's not  
19 being utilized.

20 And so I see a disconnect, or if  
21 you're going to cover crops in those soils in the  
22 alleyways between containers, but that's not --

1 you have a disconnect there.

2 And I'd like to wrestle with that a  
3 little more, because it doesn't totally make  
4 sense to me.

5 DR. THICKE: Any other comments?

6 Okay, thank you.

7 So we'll move on onto the next item,  
8 which is an update on newspaper.

9 We had looked at the possibility of an  
10 annotation change, and Harriet's going to lead  
11 that too.

12 MS. BEHAR: I don't know if there's  
13 anyone still on the Board from when -- were you  
14 on the Board? Yes, okay.

15 So, 2014 or 2015, the Board was  
16 reviewing newspaper at sunset, and there was  
17 discussion about the annotation, which had no  
18 glossy or colored inks allowed, but then some of  
19 those inks -- and there was new technologies that  
20 maybe the annotation could be changed.

21 So, we did get a Technical Review, and  
22 we reviewed it, and it's true that some are more

1 plant-based and are not as problematic, but  
2 they're not as widely used as some of the others.

3 There's still a lot of carbon black  
4 and other issues, but really, one of the main  
5 issues is the stream, and that the newspaper is  
6 all lumped together.

7 And so it's really hard to change the  
8 annotation when all of it is going to be --  
9 you're not separating out the good players from  
10 the bad players, or the good inks and the better-  
11 quality glossy.

12 So when it does come up for sunset, we  
13 probably will not change the annotation, but we  
14 really do appreciate getting the update through  
15 the TR so we can keep monitoring that issue.

16 DR. THICKE: I wanted to add that  
17 another complication we talked about in our  
18 Subcommittee is that nowadays, a lot of  
19 newspapers are using colored ink on their regular  
20 newspapers, even little hick town newspapers like  
21 mine, the front page always has a colored picture  
22 on it.

1                   And so that complicates things.

2           Emily?

3                   MS. OAKLEY: Yes, to that point, I  
4           think it actually raises the question of whether  
5           the annotation is strict enough.

6                   So I don't think we would have any  
7           regression in the annotation.

8                   I think the question is whether or not  
9           we can adhere to the principles with the current  
10          annotation.

11                   And if folks haven't read the TR, it's  
12          definitely one that's worth looking at.

13                   MR. ELA: I would echo that.

14                   If anything, the discussion made me  
15          think we should go the opposite way, if not  
16          allowing more but allowing less, because of that  
17          area.

18                   I mean, there's color inserts, there's  
19          color -- you know, and you recycle the paper.

20                   You don't go to the recycling center  
21          and recycle, oh, this add and that add, it's all  
22          commingled.

1 I mean, it's pretty clear to me it's  
2 actually probably a bigger issue than it used to  
3 be.

4 Even though industrially, we've moved  
5 to more soy-based inks and things, there's enough  
6 -- it's commingled now that it's an issue.

7 DR. THICKE: Any other comments on  
8 this issue? Harriet?

9 MS. BEHAR: So, when we do come up for  
10 sunset, well, I guess we could just still discuss  
11 if we wanted to change the annotation and make it  
12 stricter.

13 But if people can find newsprint, and  
14 I go to my recycling center, and I really  
15 appreciate the people who get the Wall Street  
16 Journal, because there's no color in that.

17 I'm always looking for that neighbor's  
18 bundle of papers. I've actually even thought  
19 about just asking them to give it to me directly.

20 DR. THICKE: You mean you don't get  
21 the Wall Street Journal?

22 MS. BEHAR: I don't get the Wall

1 Street Journal, no.

2 And actually, the organization I used  
3 to work for, MOSES, when we went to color, we did  
4 get quite a few farmers who wrote in and said,  
5 now I can't mulch with your paper anymore.

6 And we thought, well, that's true.  
7 They gained knowledge, it was for their brain,  
8 and then afterwards, it was for their gardens.

9 CHAIRMAN CHAPMAN: Okay, thank you.  
10 Unless there are any other comments, I think  
11 we're finished. You can take it, thank you.

12 Thank you, Francis, and the Crop  
13 Subcommittee. You guys had definitely a big  
14 slate of work this last semester.

15 Up next is the Compliance,  
16 Accreditation, and Certification Subcommittee,  
17 with Scott Rice as Chair.

18 Scott, I will hand the Meeting over to  
19 you.

20 MR. RICE: Thanks, Tom.

21 The first topic we have on our agenda  
22 here is a proposal for eliminating the incentive

1 to convert native ecosystems to organic crop  
2 production.

3 Harriet Behar was the lead on that,  
4 and I will pass it off to Harriet.

5 MS. BEHAR: Okay, so there was quite  
6 a few really good comments.

7 There has been, in the past, a  
8 discussion about where we could really find a  
9 place to put this. Where does the Organic Food  
10 Production Act deal with this?

11 If we were looking to do an extended  
12 period of time, how do we justify that?

13 We kind of used the section of the  
14 Organic Food Production Act that says -- and  
15 whatever else we find might be useful for us to  
16 have in our regulation.

17 But I think the robust public comment  
18 on this issue -- and really, the vast majority of  
19 it, I think I only saw one negative comment on  
20 this -- was yes, we should do this, that this is  
21 part of organic agriculture, that we are  
22 protecting the very important ecosystems that

1 give us so many services, not just in farming but  
2 as humans on this planet.

3 Caring about wildlife, caring about  
4 just a diversity of plant life as well, and to  
5 protect endangered and threatened species.

6 So with that, I have to thank Jo Ann  
7 Baumgartner and the Wild Farm Alliance.

8 She really reached out to many people  
9 in the community, and probably got even more  
10 comments than we would have had, had she not done  
11 her work on the ground.

12 And so she does have very detailed  
13 comments, and the vast majority of the commenters  
14 referred back to her comments on changing the  
15 definition and -- no, changing our wording in the  
16 rule and adding a definition of what a native  
17 ecosystem is.

18 So I'm not sure if we want to discuss  
19 some of her comments now, because I am going to  
20 recommend that we send it back to Subcommittee.  
21 I'll make that motion.

22 MS. OAKLEY: I'll second.

1 MS. BEHAR: So we can review more in  
2 detail and work with the program, which we had  
3 done before, to make sure that whatever we are  
4 recommending, there is a possibility of  
5 eventually having rulemaking.

6 MR. RICE: Thanks, Harriet. Some  
7 discussion, Emily?

8 MS. OAKLEY: I think that the public  
9 comments revealed some weaknesses in our motion  
10 wording that I don't think we intended.

11 I think that there are definitely  
12 loopholes that I didn't foresee, and I thought we  
13 were trying to address them.

14 Clearly we did not do that well, but  
15 our intention was not for those loopholes to  
16 exist, so I appreciate the work of others in  
17 thinking that through better.

18 And thank you, Jo Ann, for that work,  
19 and also NatureServe.

20 And I agree we probably do need to  
21 define native ecosystem. We did discuss that  
22 briefly in the Subcommittee.

1                   We thought that the motion helped  
2 define it, but I think it's clear that there's  
3 enough confusion.

4                   I know there has also been some  
5 concern over that step down from a native  
6 ecosystem in areas that are recovering in the  
7 period of time.

8                   So there's a little more controversy  
9 in that area, so we need to address that as well.  
10 But I think that concerns over how to enforce  
11 this were actually generally pretty mild.

12                  And I think that people have expressed  
13 an understanding that those concerns can be  
14 overcome.

15                  So I hope we can take this back and  
16 give it a little bit more work and incorporate  
17 some of the public comments, or a lot of the  
18 public comments that we have received.

19                  MR. RICE: Tom?

20                  CHAIRMAN CHAPMAN: Yes, I still have  
21 some concern around defining a native ecosystem,  
22 and I remember, the strategy of the way we wrote

1 our proposal was to avoid having to write  
2 something in detail around it.

3 It was somewhat being defined by the  
4 practices that would have occurred on that land  
5 before.

6 I agree that with the public comment  
7 that we received, we should send this back and  
8 take it under further review.

9 And also, some commenters pointed to  
10 the IFOAM way of regulating it, and that seemed  
11 like a fairly elegant way that we had struggled  
12 with, to try to almost do a similar but different  
13 definition too.

14 But one of the biggest concerns I had  
15 was the request for inspectors to be able to go  
16 out and identify these native ecosystems while  
17 they're doing these inspections.

18 And it seems like we ask a lot of our  
19 inspectors, and that just, to me, seems a step  
20 too far, from back in my certification days, to  
21 expect them to be able to do that across the wide  
22 range of ecosystems they may encounter.

1                   And I know we have some folks on the  
2 Board who do inspections, sorry to put you on the  
3 spot, but I'm curious to hear your thoughts on  
4 it, or people who also still work in the  
5 certification range.

6                   And I'm interested to hear your  
7 thoughts on it as well.

8                   MR. RICE: I'm happy to give some  
9 thoughts.

10                   I kind of share that same concern.  
11 While I think there was good support of this from  
12 the certification community, that was probably  
13 the primary concern with this, was that  
14 verification step.

15                   And we've seen really great inroads on  
16 adding biodiversity and natural resources to that  
17 slate of things that inspectors are taking a look  
18 at in the field.

19                   And we've seen some really good tools  
20 via NRCS, and certainly, again, Wild Farm  
21 Alliance.

22                   We had some good partnerships with

1 certifiers on that, but we see a continual  
2 addition of things for our inspectors to add to  
3 their reports, what they're observing, and I  
4 think that adds to the time and ultimately  
5 expense.

6 And it's certainly valuable in looking  
7 at these things, but we may reach a point where  
8 some ideas have been expressed to have perhaps an  
9 inspection that focuses more specifically on the  
10 biodiversity and natural resources, and in turn,  
11 maybe these native ecosystems.

12 And definitely looking at those more  
13 specifically, but I think just looking for where  
14 that technical assistance and training can come  
15 from to help bolster that too.

16 MS. BEHAR: I actually don't think  
17 there's going to be that much on-site review,  
18 because it's going to probably be more in the  
19 application of the Organic System Plan, how long  
20 it's been since it was tilled.

21 And if they say, well, the land's  
22 never been tilled, then it would put up a red

1 flag.

2 But let's say it had been tilled three  
3 years ago for the first time, or something like  
4 that, we won't really have a chance to look at  
5 it. But we'll have to figure out had it been a  
6 native ecosystem before it had been tilled?

7 I don't think that the inspector -- I  
8 mean, typically, the first inspection is during  
9 the crop year of what you're going to certify. So  
10 at that point, it would have already been  
11 destroyed.

12 So unless you have fringe or something  
13 like that that you're looking at to try to judge  
14 what might have been there, I don't think it's  
15 going to be so much on site.

16 But there are a lot of tools, both  
17 internationally and domestically, for researching  
18 what Regions have threatened species, what  
19 Regions have intact native ecosystems and that  
20 sort of thing.

21 So, I think it's going to be somewhat  
22 of choosing the right questions in an Organic

1 System Plan, to then figure out which -- I think  
2 99 percent of the applications, you're just going  
3 to breeze through the Organic System Plan.

4 And then there's going to be a one  
5 percent that may take a little bit more review,  
6 mostly online to see what could have been there  
7 before.

8 MR. RICE: Thanks. We have Ashley,  
9 then Emily, then Sue.

10 MS. SWAFFAR: So I think organic  
11 inspectors are very bright people, but I do have  
12 a little bit of worry about some different  
13 Regions going into looking at the farms that I  
14 inspect, going into Montana.

15 What is that native ecosystem?

16 It's a very different landscape than  
17 Arkansas and the Midwest, and I think there will  
18 need to be quite a bit of inspector training on  
19 making those judgment calls on what that is.

20 And so certifiers will have to work  
21 with inspectors, definitely, on that.

22 MR. RICE: Emily?

1 MS. OAKLEY: I agree with Harriet, I  
2 don't think this is probably going to be  
3 something that all or that many inspectors  
4 encounter on a very frequent basis.

5 So I think there could be some cost-  
6 benefit within certifying agencies in terms of  
7 training, a few maybe more in depth in terms of  
8 some of the native ecosystems around them, or  
9 that they're expected to encounter.

10 And I also think that a lot of this  
11 will take place prior to the inspection, as  
12 Harriet mentioned.

13 So I think a lot of the ground  
14 truthing would take place with the Organic System  
15 Plan, and then afterwards.

16 I also think it probably isn't, as I  
17 said and has been documented before, a huge  
18 percentage of operations.

19 So I think while it may increase cost  
20 in a few instances, I don't think it will be  
21 widespread.

22 I also just want to point out the NOP

1 guidance on biodiversity, and there is an  
2 expectation that certifiers and inspectors have a  
3 knowledge of biodiversity that may not  
4 necessarily equate into native ecosystem  
5 knowledge.

6 But I think there's a clear dovetail  
7 there.

8 MR. RICE: Sue?

9 MS. BAIRD: I remember one of my first  
10 inspections when I went to Montana. And what I  
11 said to them was how many cows per acre do you  
12 run?

13 And they laughed, of course, because  
14 in Montana it was how many tens of acres do you  
15 run per one cow.

16 So I do think there will be a learning  
17 curve for the inspectors if they go to other  
18 areas.

19 But on the other hand, I've inspected  
20 for probably 23 years now, and I like new  
21 challenges. I think that it will be, as Harriet  
22 said, a lot of it will be how you design your

1 System Plan?

2 And how that review is done up front,  
3 because we've been reminded many times, the  
4 inspector is the eyes.

5 It's the certifier who designs that  
6 System Plan. We only verify to that System Plan.  
7 That's our job as inspectors.

8 So with training, I don't think that  
9 it will be a problem. I think we're going to  
10 make some mistakes, we may ask how many cows per  
11 acre that first time, but we'll be educated.

12 MR. RICE: Yes, I would just add that  
13 responsibility will be on the certifier.

14 And that, in turn, leads to having  
15 consistent tools that we can be turning to, to  
16 make these determinations in a consistent way.

17 So definitely further need for  
18 training all around on that. Harriet?

19 MS. BEHAR: And so I am thinking that  
20 in the next proposal, there might be some  
21 suggestions for what could be asked in the  
22 Organic System Plan to kind of help the

1 certifiers and the operators up front.

2           Because this is a little bit kind of  
3 new ground for us, and it's a native ecosystem  
4 that we don't want to destroy.

5           So I think giving some options; it may  
6 not be, this is what you should do, but something  
7 like this, will take a little bit of the fear,  
8 both for the certifiers and the operators.

9           And I'm always thinking about the  
10 operator; when they read the Organic System Plan,  
11 can they complete it? Is it practical? Does it  
12 make sense to them?

13           So I'm looking at it from that angle  
14 too.

15           MR. RICE: Dave?

16           MR. MORTENSEN: Yes, I was struck by  
17 Bob Noonan's comments yesterday, the farmer from  
18 New Hampshire.

19           And one of the things that has been  
20 quite an eye-opener for me is the extent to which  
21 regional variation exists across the country. I  
22 knew that already.

1           But so the Northeast was all under ag  
2           100 years ago, most of it, and a state like New  
3           Hampshire, a lot of it is no longer in  
4           cultivation.

5           And they have an initiative underway  
6           in the state to actually grow their own food in a  
7           local regional context so that there's an  
8           interest in exploring how that land is made  
9           available to provide their own fruit and  
10          vegetables.

11          So I think as we go forward with the  
12          proposal, I'm totally on board with the ecosystem  
13          services and protecting the environment, but I  
14          think it's entrusting to be sure that we keep in  
15          mind the regional variation across the country,  
16          and how land use plays out.

17          MR. RICE: Sue, and then, I think,  
18          Harriet, we're going to have to wrap this up  
19          pretty quick here.

20          MS. BAIRD: I totally agree with Dave.  
21          We do need to be cognizant of regional  
22          differences, and it brings to mind some of the

1 native prairie grasses in Kansas and Nebraska  
2 that have never been tilled or plowed.

3 And yet they hay them and they use it.

4 And because they do those kind of  
5 cultural practices, they probably fall within  
6 this criteria.

7 And yet some people are protecting the  
8 environment by using cultural practices.

9 MS. BEHAR: So on my own farm, I  
10 recently went through kind of an environmental  
11 assessment, because I'm in an NRCS program.

12 And I was supposed to put in some frog  
13 ponds, because I love amphibians.

14 And there are a lot of online  
15 resources for determining -- I mean, they were  
16 able to figure out -- gave them a map, gave them  
17 the coordinates of where it was.

18 And they could say, is this an area  
19 where there's an ecosystem?

20 Because they would not have allowed me  
21 to come in and do those shallow scrapes, if there  
22 would have been an issue.

1           So I think there's a lot of tools out  
2 there to help us with that determination.

3           MR. RICE: Okay, one more from Emily.  
4 Oh, no? Okay.

5           All right, we have a motion on the  
6 table. Are we ready for a vote?

7           CHAIRMAN CHAPMAN: Yes, I'll take it  
8 from here, or maybe not because I don't have my  
9 voting sheet open.

10           All right, who are we starting with?

11           MS. BEHAR: We're starting with Emily.

12           CHAIRMAN CHAPMAN: All right. So, the  
13 motion is to refer this proposal back to the  
14 Subcommittee.

15           The motion was made by Harriet and  
16 seconded by Emily.

17           A yes vote would refer this back to  
18 the Subcommittee, a no vote would continue  
19 discussion here.

20           Voting will start with Emily. Sorry,  
21 it's early in the morning for me still. Emily?

22           MS. OAKLEY: Yes.

1 DR. THICKE: Yes.

2 MS. BRIONES: Yes.

3 MS. DE LIMA: Yes.

4 MR. BRADMAN: Yes.

5 MS. MOSSO: Yes.

6 MR. ELA: Yes.

7 MR. MORTENSEN: Yes.

8 MR. BUIE: Yes.

9 MS. SWAFFAR: Yes.

10 DR. SEITZ: Yes.

11 MR. RICE: Yes.

12 MS. BAIRD: Yes.

13 MS. BEHAR: Yes.

14 CHAIRMAN CHAPMAN: Chair votes yes.

15 15, yes; 0, no. The motion passes. Scott?

16 MR. RICE: Thanks, Tom. Next up on  
17 our agenda is a proposal regarding excluded  
18 operations in the supply chain. I'll bring that  
19 one up here.

20 We started this discussion with the  
21 intent to suggest a regulatory change to remove  
22 exclusions; however, we received some

1 encouragement from the program to look at this  
2 using existing authority given there's not a real  
3 friendly climate to additional regulation.

4           However, at that time, we kind of  
5 changed tack and explored ways to address those  
6 excluded operations via strengthening of  
7 guidance.

8           About that same time, we saw this  
9 fraudulent grain issue emerge.

10           And as we finalized this proposal,  
11 NOSB received, of course, a request from the  
12 program to add the issue of oversight of imports  
13 to our work plan.

14           We considered the idea of tackling all  
15 of that in one document; however, we pulled back  
16 on that, and decided to continue as planned and  
17 address the NOP's request as a separate issue,  
18 which we'll be taking up very soon.

19           And we then focused in this on the  
20 definition of an exempt operation and the  
21 requirements that must be met for an operation  
22 to, indeed, be considered exempt.

1                   And focusing on the aspect of  
2                   labeling, that to be exempt, that product must be  
3                   labeled as organic, include a certified organic  
4                   by-statement, and an ingredient list as  
5                   applicable.

6                   We found labeling a product or  
7                   containers to be required based on the text of  
8                   205.101(b)(1).

9                   Also, 303 requires packaged product  
10                  labels for organic to identify each ingredient  
11                  with organic, below an identifying statement, and  
12                  a certified organic by-statement to identify the  
13                  certifying agents, and certified handler of the  
14                  finished product.

15                  Operations involved in the sale and  
16                  distribution of retail-labeled products would be  
17                  exempt if such products were already packed and  
18                  remained in the same packaging, and not further  
19                  processed or packaged.

20                  These non-retail containers must  
21                  comply with the requirements of 307 and retail-  
22                  labeled product must comply with 303.

1                   In parts of this, we recognize an  
2                   interpretation of the regulation that's a little  
3                   different than what was held by the NOP and how  
4                   NOP has trained on this with certifiers.

5                   And in the developing this, we also  
6                   receive feedback, however, from the program that  
7                   the regulation supports this interpretation.

8                   As we saw noted during public comment  
9                   yesterday, we understand NOP will be training on  
10                  this in February with certifiers, and look  
11                  forward to clarification and confirmation that  
12                  that's, indeed, the interpretation.

13                  We had a lot of really good public  
14                  input on this.

15                  And I also wanted to stress, in a lot  
16                  of that public comment, what we received was this  
17                  is excellent, we have some tweaks to language  
18                  here and there. But really, what we do want to  
19                  see is a regulatory change.

20                  And as we've also heard, this is just  
21                  one of a number of issues in this area. The  
22                  Accredited Certifiers Association is working on

1 this issue.

2 The IOIA, the International Organic  
3 Inspectors Association, is offering a webinar to  
4 address this, and OTA has touched on this to a  
5 great deal with the Global Integrity Taskforce.

6 And further, there's the proposed  
7 Organic Farming and Consumer Protection Act, as  
8 part of the Farm Bill, mandating NOP to close  
9 regulatory loopholes by mandating that  
10 uncertified entities, including ports, brokers,  
11 importers, online auctions, become certified.

12 So a lot of work in this, and again,  
13 we've heard a lot of public comment supporting  
14 the work.

15 And we feel that we still want to move  
16 forward on this document and have it for a vote  
17 today because we feel it is important to put this  
18 forward as the first step.

19 Briefly, in terms of comments, there  
20 was some suggestion to adjust the language to  
21 consider portions of operations, as is used in  
22 the regulation, and that NOSB should work with

1       NOP to see that the full implementation of  
2       suggestions from the OIG report be addressed.

3               And we did hear from several  
4       commenters that exempt and excluded, which  
5       bedevils a lot of us, was interchanged in the  
6       document.

7               And we feel that's something that  
8       could be cleaned up as we move forward on this,  
9       and that's something the NOP could address as a  
10      minor adjustment.

11              In terms of impacts, we heard that  
12      generally, negative impact would be minimal, and  
13      that those uncertified handlers and brokers out  
14      there that come into certification would only  
15      strengthen the supply chain.

16              In terms of economic impact, that  
17      might come as a cost of certification, and then  
18      pass through the price of goods.

19              But again, leading to the greater  
20      advantage that we are strengthening integrity.

21              And I think I will leave it at that.  
22      That is a quick summary on that, but I wanted to

1 open it up to discussion or offer to Tom, if you  
2 had anything to add?

3 As Tom was a huge asset on this and  
4 put a lot of work into it, so much appreciated on  
5 that front.

6 CHAIRMAN CHAPMAN: I think that was a  
7 fairly good summary. I'll wait to see if there's  
8 other questions.

9 The one thing I just want to raise to  
10 folks is I am planning to make an amendment  
11 that's not significant -- that's not the right  
12 term -- that's not significant, though, to  
13 correct the exempt-excluded kind of confusion of  
14 terms that we use in here, to just correct that  
15 so when we do forward this onto the program, we  
16 don't have that mixup.

17 I'll do that after the discussion, if  
18 there is any. Emily?

19 MS. OAKLEY: I was just going to  
20 suggest that you go ahead and make that motion  
21 now; that might help the discussion.

22 CHAIRMAN CHAPMAN: Okay. So all

1 right, now I've got to think of how I'm going to  
2 word this.

3 I move to amend the proposal to  
4 correct the word exempt where used incorrectly,  
5 and replace it with excluded.

6 MR. RICE: We have a motion on the  
7 table.

8 MS. OAKLEY: I'll second.

9 MR. RICE: Second from Emily.  
10 Discussion?

11 CHAIRMAN CHAPMAN: So, Ashley  
12 whispered in my ear over here that we should  
13 point it out it's used throughout the document in  
14 I would say over a dozen places incorrectly.

15 So, I don't want to go through every  
16 page and point it out. It's quite clear where  
17 it's used incorrectly. This was only about  
18 excluded operations.

19 So, we used exempt only in times when  
20 we're talking about exempt operations not being a  
21 part of what we were talking about.

22 So, it's quite clear where we used it

1       incorrectly, and so it was just to correct those  
2       spots.

3                   All right, if there's no further  
4       discussion, we'll move -- yes, Harriet?

5                   MS. BEHAR: I support this.

6                   CHAIRMAN CHAPMAN: So, we're going to  
7       have two votes, although, we can have one vote  
8       and more discussion if we want to.

9                   But the first vote is just on the  
10      amendment to fix the wording.

11                   The motion was made by Tom and was  
12      seconded by Emily. Voting will start with  
13      Francis.

14                   A yes-vote is to accept the amendment,  
15      and a no-vote is to reject it. Francis?

16                   DR. THICKE: Yes.

17                   MS. BRIONES: Yes.

18                   MS. DE LIMA: Yes.

19                   MR. BRADMAN: Yes.

20                   MS. MOSSO: Yes.

21                   MR. ELA: Yes.

22                   MR. MORTENSEN: Yes.

1 MR. BUIE: Yes.

2 MS. SWAFFAR: Yes.

3 DR. SEITZ: Yes.

4 MR. RICE: Yes.

5 MS. BAIRD: Yes.

6 MS. BEHAR: Yes.

7 MS. OAKLEY: Yes.

8 CHAIRMAN CHAPMAN: Chair votes yes.

9 15, yes; 0, no. The motion passes.

10 MR. RICE: I'd ask for any further  
11 discussion on this before we move to vote--  
12 Harriet?

13 MS. BEHAR: I think this is a really  
14 important first step.

15 I think there's still more things that  
16 we can do, but I'm sure the organic inspectors in  
17 the room, and buyers and everyone, can speak to  
18 the fact that there's been a very large loophole  
19 for a long time, as far as in the audit trail.

20 And it drove many of us who were  
21 trying to follow an audit trail a little crazy  
22 that there were these gaps. So, I'm hoping this

1 will be a good first step to closing some of  
2 those gaps.

3 CHAIRMAN CHAPMAN: Yes, and I just  
4 want to say as we worked on this, it became quite  
5 clear that we worked on it, as Scott said, in the  
6 mind of imports originally.

7 And then we got the bigger import  
8 issue, which is definitely more than just this.  
9 And then as we were digging into this, this  
10 became more than just imports and this.

11 Especially from the comments from  
12 Organic Produce Wholesalers Group, there's  
13 clearly concerns on the produce side as well that  
14 aren't being addressed, in addition to other  
15 concerns that were raised up.

16 So, additional work is needed on  
17 excluded operations, I agree with that.

18 I'm also aware of proposed legislative  
19 changes that may impact OFPA, which would then  
20 also direct the program to further restrict this  
21 section of the regulations, although, you know,  
22 it's just proposed legislation at this point, and

1 it's not rule.

2 So, I struggle with how quickly we go  
3 after next steps.

4 Imports are on our agenda, and this is  
5 still somewhat related to imports, so in that  
6 regard, we're still going to be talking about it.

7 But do we want to pick up work, do we want  
8 to request to continue to work on excluded  
9 operations right away?

10 Or do we kind of want to wait to see  
11 what the legislative fix is, since that may  
12 empower us in the Department to move forward with  
13 regulatory changes in a non-regulatory change  
14 environment?

15 And I see the program raising their  
16 hand, but Scott's in charge.

17 DR. TUCKER: Hi, good morning. The  
18 program would encourage the Board to continue to  
19 work on this topic.

20 The Secretary has indicated a lot of  
21 interest in enforcement, in strengthening  
22 enforcement with imports.

1                   This is part of that puzzle, and so we  
2 would encourage the Board to continue to work on  
3 it.

4                   CHAIRMAN CHAPMAN: So, some of the  
5 comments that I was mentioning were related to  
6 the produce industry.

7                   We're definitely still working on  
8 imports. That's a separate Work Agenda Item that  
9 we have yet to dive into in detail.

10                  But a lot of the produce industry  
11 comments, while also relevant in an international  
12 import situation, are also relevant within a  
13 domestic supply chain situation as well.

14                  And so we're still encouraged to work  
15 on that activity.

16                  DR. TUCKER: So, the Department's  
17 interest in enforcement is not just about  
18 imports. It's also about the entire supply chain  
19 domestically and internationally.

20                  So, we think this is an important  
21 topic and despite anything else that has  
22 happening, your perspective on this is very, very

1 valuable.

2 CHAIRMAN CHAPMAN: Excellent, that's  
3 good to hear. I know the program cares about  
4 enforcement, and that's kind of a silly thing  
5 that has to be said.

6 But it's quite clear what you guys do,  
7 and it's good to see that we're all very aligned  
8 in the direction on this.

9 DR. TUCKER: And thank you for the  
10 work you've done on this so far.

11 MR. RICE: Francis?

12 DR. THICKE: I thank you too for the  
13 work you've done, and I wanted to urge you to  
14 keep working on it, and NOP also too.

15 And I wanted to add a personal  
16 anecdote, because this is really hurting organic  
17 crop farmers.

18 In the Midwest, we really see it, and  
19 I'll give you a personal anecdote.

20 About two years ago, I bought a couple  
21 hundred acres of land that set me back \$1.2  
22 million, with a \$90,000 a year payment, projected

1 on the prices of organic crops at that time, and  
2 crops took a big steep fall.

3 In the first year, I lost \$50,000 on  
4 that crop compared to what I had anticipated,  
5 which makes a big problem for me trying to keep  
6 that debt serviced.

7 And then to buy the equipment, I  
8 needed to make it work.

9 So, this is something that's really  
10 affecting crop farmers out there, so we need to  
11 move as fast as we can to shutter this hole.

12 MR. MORTENSEN: The other way that  
13 it's affecting it, Francis, is that it's having a  
14 profound effect, at least I know in our Region,  
15 on farmers transitioning to organic.

16 There's a huge demand for corn grain  
17 and other grains for the poultry industry, for  
18 example, and if we're going to meet that demand  
19 by taking grain from overseas, then the farmers  
20 perceive that the scrutiny on the grain is not  
21 high.

22 And it's killing interest in meeting

1 the demand locally, and so I really support what  
2 you're saying.

3 MR. RICE: Sue?

4 MS. BAIRD: I came, in another life,  
5 from a Managing and Feeding seed program through  
6 the Department of Ag., and when I first came into  
7 the organic circle, which was in 2000 -- and so  
8 they did the training and we did all that.

9 And Bob Pooler then was in charge, and  
10 I went up to him and I said, are you telling me  
11 that grain brokers are exempted? And he said  
12 yes.

13 And I said, I can't believe that,  
14 that's where this hole's always at.

15 This has been a hole forever and I am  
16 thrilled that we are finally trying to address  
17 it. So, yes, let's move forward.

18 MR. RICE: Are we ready to -- or did  
19 we get the motion up? I lost track now.

20 CHAIRMAN CHAPMAN: Yes, unless there's  
21 further discussion we can move to the vote.

22 MR. RICE: Okay.

1                   CHAIRMAN CHAPMAN: All right, so the  
2 motion is to approve the proposal as amended on  
3 excluded operations in the supply chain.

4                   The motion was made by Tom and was  
5 seconded by Harriet. Voting will start with A-  
6 Dae. A yes-vote is to accept the proposal, a no-  
7 vote is to reject.

8                   MS. BRIONES: Yes.

9                   MS. DE LIMA: Yes.

10                  MR. BRADMAN: Yes.

11                  MS. MOSSO: Yes.

12                  MR. ELA: Yes.

13                  MR. MORTENSEN: Yes.

14                  MR. BUIE: Yes.

15                  MS. SWAFFAR: Yes.

16                  DR. SEITZ: Yes.

17                  MR. RICE: Yes.

18                  MS. BAIRD: Yes.

19                  MS. BEHAR: Yes.

20                  MS. OAKLEY: Yes.

21                  DR. THICKE: Yes.

22                  CHAIRMAN CHAPMAN: Chair votes yes.

1 15, yes; 0, no. The proposal passes.

2 MR. RICE: We have on the agenda  
3 preliminary discussion on imports.

4 I would say that I would put a check  
5 mark next to that in the interest of maybe  
6 getting us back on time.

7 So, unless there are further thoughts  
8 on that at this time --

9 CHAIRMAN CHAPMAN: I'm not so worried  
10 about time, so if people had some thoughts on  
11 this, I'd love to get just -- you know, we had  
12 the folks here from the Federal Agency.

13 This is going to go back to the CACS.  
14 CACS is somewhat a smaller Committee.

15 So, I mean, it would be great if there  
16 were some other initial thoughts from other Board  
17 Members to get that out there now so we could  
18 direct our work appropriately.

19 MR. RICE: Okay, Dan, then Dave, and  
20 Harriet.

21 DR. SEITZ: This is just a question.  
22 I'm curious to know what role, if any, testing

1 can play when there's a suspect shipment of grain  
2 or some other product?

3 So, this is a clarifying question. Is  
4 there authority to do that?

5 And are there tests that can be useful  
6 in addition to tracking the documentation from  
7 person to person, or company to company?

8 MR. RICE: I can answer that too.  
9 Yes, the simple answer is testing can be used.  
10 And it's not the only tool that we have, but it's  
11 certainly one that we can draw on.

12 And that's something that, in the  
13 certification world, is done on a risk basis, on  
14 random, and in reaction to, in response to, known  
15 issues.

16 And in terms of tracking, we heard  
17 from the Panel and from other commenters a number  
18 of technologies that are out there.

19 They're not going to be here tomorrow,  
20 but it's certainly working towards something that  
21 -- technology is a constraint at this point.

22 Tom, did you have a response to that?

1                   CHAIRMAN CHAPMAN:  Yes, I think  
2                   there's situations where testing is very useful  
3                   in detecting fraud, and there's other situations  
4                   where it's not going to tell you anything at all.

5                   I was just talking to someone last  
6                   night about an imported sweetener product that  
7                   was so highly processed, it wouldn't show  
8                   anything.

9                   But they were testing it for  
10                  pesticides, which, you know, is good due  
11                  diligence. I'm not trying to discourage that from  
12                  happening, but it's not going to reveal what  
13                  you're looking for in that situation.

14                  So, it doesn't work in every  
15                  situation.

16                  MR. RICE:  Thanks.  Okay, we've got  
17                  Dave and Harriet?

18                  MR. MORTENSEN:  Yes, so I guess I had  
19                  a couple of thoughts.

20                  One is that over the last year, when  
21                  the issue of the grain imports would come up, I  
22                  didn't feel as though we were having enough open

1 discussion and frank communication between NOP  
2 and the NOSB on what was going on.

3 We raised this a number of times on  
4 the phone during our conversations, and I don't  
5 think we're having enough dialog, enough  
6 throughput of open communication.

7 So, I guess I would like to just have  
8 a discussion, or at least just have it be known  
9 that I think we could do better there. That's  
10 one point.

11 The second thing that I came away from  
12 the morning presentation with was that, and I  
13 have this funny way of expressing myself, and  
14 pardon me when I ask silly things like have we  
15 run a mental sensitivity analysis on this?

16 What I mean by that is have we been  
17 able to figure out if something is accounting for  
18 99 percent of the problem, let's not focus on the  
19 other 93 things that account for 1 percent of the  
20 problem.

21 Because we have limited time and  
22 resources, that's all.

1           And so I'm not convinced that a system  
2 alone -- that to me looks like 70 percent of the  
3 problem, or maybe it's 60 percent of the problem.

4           The other problem is that U.S. exports  
5 of organic goods have been flat over the last  
6 four years, about \$500 million give or take, \$100  
7 million.

8           At the same time, in the same  
9 interval, imports of organic goods have tripled  
10 from about equal five years ago, export-import  
11 about equal, to now \$1.65 billion imports, three  
12 times what it was four or five years ago.

13           I asked our speakers in the break  
14 period, because they answered we'll have a better  
15 tracking system, problem solved. They didn't  
16 really say problem solved. So, I have a tendency  
17 to overstate.

18           They said we'll have a better tracking  
19 system, implying that would solve the problem.  
20 I'm not convinced.

21           I think, and I asked one speaker in  
22 particular, I said what happens when you have a

1 three-fold increase in magnitude of stuff coming  
2 in?

3 Because I know what the problem is on  
4 the pest side, because I've worked with APHIS at  
5 the port of entry on pest entry. And they said  
6 it's huge.

7 You're dealing with a different  
8 gorilla when you have that much stuff coming in.

9 You've got to have a lot more people  
10 on the ground, you have to have a much more  
11 rigorous system at the port of entry, you have to  
12 have people on the ground on the end where it's  
13 being produced. You have to have people here.  
14 And so I don't feel like we're really getting at  
15 the problem.

16 And so as a Board, I guess I just ask,  
17 it seems to me that we are setting the rules but  
18 we're not having a sense for whether we're in the  
19 ballpark of following them, in this case. That's  
20 my concern.

21 MR. RICE: Harriet?

22 MS. BEHAR: So, I think this issue,

1 especially of fraudulent imported grain but it's  
2 also in other areas too, where the regulations  
3 have not been followed, that trust is really all  
4 we have.

5 Integrity is all we have. And that  
6 imported fraudulent, quote, unquote, organic  
7 grain affects not just the grain-growers.

8 The consumers will wonder, well, are  
9 my organic eggs really produced by chickens that  
10 were fed organic feed?

11 Is my organic milk really organic? Is  
12 my organic coffee, my organic bananas? I mean,  
13 it affects everything, all the way down the  
14 chain.

15 So, it's not just the grain-growers,  
16 really, that I'm concerned about.

17 They're the first in line, the  
18 canaries and the coal mine, but it's the entire  
19 organic label and it's everyone. It's the  
20 retailers, it's the distributors, it's everyone  
21 who could be affected.

22 And in the end, it's the consumers

1 because we're trying to give them organic food.  
2 And so I think this is just a very important area  
3 that we really do pay attention to.

4 And I think, too, it was really  
5 valuable for me to have that Panel, so I have a  
6 better understanding of what happens at port of  
7 entry.

8 But there's even things that happen  
9 here that we should be having more input on, like  
10 fumigation and then tracking what loads might  
11 have been fumigated.

12 And that's something that too could  
13 have been an actual organic product coming in,  
14 but then lost its organic status on our soil.

15 So, a very important area and I intend  
16 to remain engaged.

17 MR. RICE: Tom, and then Lisa?

18 CHAIRMAN CHAPMAN: I thought Emily had  
19 her hand up. I wanted to say something building  
20 on what Harriet said, and I want to say something  
21 to build and respond to what she said.

22 And then since the conversations we

1 had as a Board and on the Executive and some  
2 other places, I also attended a session at Expo  
3 East, where Betsy and Miles, before he retired,  
4 were both there.

5 And it was around enforcement and  
6 there's clearly -- we feel we have a special  
7 relationship with the program given how we advise  
8 them, but everything given to us is also still a  
9 public document.

10 And during enforcement procedures --  
11 and maybe I'm going to pause here briefly and  
12 hand it over to the program to talk a little bit  
13 about enforcement.

14 But in order to build that case, they  
15 need to maintain some level of confidentiality  
16 while that case is being built and brought.

17 And I think that's where we have this  
18 constant unease of is enforcement activity  
19 occurring?

20 And then I gave these complaints or am  
21 aware of these complaints, where are they at in  
22 the process, in the programs, going through their

1 procedures and what they need to do.

2 If you do go -- and related to a lot  
3 of these grain issues that we're speaking about,  
4 there is some public information now available on  
5 the Web because of either appeals or enforcement  
6 actions that were carried out.

7 And the program can maybe speak a  
8 little bit to that.

9 But I'd really like to hand it over to  
10 you guys really briefly just to talk about that,  
11 enforcement, what you can share, when you can  
12 share, why you can't share more.

13 DR. TUCKER: Okay, so the  
14 investigations are ongoing and this is a key  
15 priority for us.

16 As you've noted, and I shared the link  
17 yesterday, the NOP update slides, if you go to  
18 the AMS website and you search on NOP  
19 enforcement, you're going to get to a page, and  
20 you can see when the program and the Agency  
21 issues a final suspension or revocation.

22 They are now posted on that site. And

1 that's new. So, final revocations, final  
2 suspensions are posted on that site.

3 If there is an appeal of a proposed  
4 notice, then a decision or a settlement is  
5 reached on that, those are also posted.

6 Now, even when an administrator's  
7 decision is posted denying an appeal, the  
8 appellant does have a chance to request a  
9 Hearing.

10 We do post the administrator's  
11 decision but we also do note that a Hearing has  
12 been requested.

13 So, we have issued Directives to  
14 certifiers that are operating in the Region of  
15 concern to do increased testing, to do increased  
16 reporting.

17 I think as I mentioned yesterday, the  
18 organic industry has been growing very, very  
19 quickly. And that requires everybody in the  
20 system to make adjustments.

21 So, I think certifiers are coming to  
22 terms with what does this mean in terms of how

1 they oversee operations in that area.

2 They are looking at, well, how are we  
3 doing traceback and mass balance audits?

4 We are emphasizing that with  
5 certifiers; that's why we had training this  
6 summer on those topics. We'll continue to have  
7 training, particularly our face-to-face training,  
8 over the winter.

9 We are increasing our certifier audits  
10 in that area, but I think, again, the entire  
11 system is adjusting to this new reality that is a  
12 response to very rapid growth in the industry.

13 So, we can't share the details of  
14 specific investigations as they're going on, but  
15 you can keep an eye on that website for those  
16 final actions.

17 The other link on that page that we've  
18 added is you can, with one click, get a list of  
19 every single suspended and revoked operation.

20 And if you do a filter, you can do  
21 that by country, you can do that by certifier.  
22 So, we don't post all the final suspensions and

1       revocations that certifiers issue, but they are  
2       issuing them.

3               And so if you do do a search by  
4       country, by certifier, you can see what they're  
5       doing as well. So, that's the level of reporting  
6       that right now is happening on the site. Again, I  
7       can't emphasize enough how important this is to  
8       us.

9               I think the OIG audit is incredibly  
10       important in framing a roadmap for next steps. I  
11       totally agree that it's not just the  
12       documentation, it's not just the systems, it is  
13       the boots on the ground.

14               It is the certifiers out there, it's  
15       NOP with the certifiers, all incredibly important  
16       activities.

17               Did that help?

18               CHAIRMAN CHAPMAN: Yes, I think -- do  
19       you want to add something? Because I have  
20       something else after this but it's unrelated.

21               MR. MORTENSEN: Part of this is that  
22       for me it's helpful that we have a dialog, so I'm

1 not trying to be a bugger about it.

2 But Jenny, one of the things that I  
3 think is important in a process is that we all  
4 take action when we're responsible.

5 And actions are laudable. Thank you.  
6 But we also need to see the impact of the action  
7 as a Board.

8 We need to know that this action or  
9 this suite of actions improved the outcome. And  
10 I think for me, that's a place where I just don't  
11 feel like I have a sense for what the outcomes  
12 are.

13 And honestly, linking to one specific  
14 action that's been taken, and this is just a  
15 process point, is not going to inform my  
16 understanding of how the system is behaving.

17 It will tell me this one action was  
18 resolved in Court by X, Y, Z, but it doesn't  
19 bolster my confidence or my insight as a Board  
20 Member in understanding whether we're doing  
21 better or not, when I know that I'm the  
22 scientist.

1 I'm also a person tightly connected  
2 with organic farmers in my Region and I'm hearing  
3 them tell me that they can't get into what they  
4 want to do because of this problem.

5 And I can't really say anything  
6 intelligent to help them understand that we're  
7 doing better or not right now.

8 That's my concern.

9 So, it's outcomes, impact and  
10 outcomes.

11 If we could figure out how we do a  
12 better job of communicating those so that the  
13 Board can sort of get a sense for whether we're  
14 moving up or flat, we're going backwards.

15 DR. TUCKER: Can I respond to that?

16 MR. MORTENSEN: I'm finished.

17 DR. TUCKER: Okay, so I totally agree  
18 that both process and outcome is important.

19 There will be system-level actions  
20 like we learned about yesterday, and so there are  
21 system levels that raise the capability across  
22 the entire system at all levels, so at NOP,

1 certifiers, certified handlers, knowing what to  
2 look at.

3 So, there will be actions at all of  
4 those levels, and those are still being defined  
5 and are underway.

6 And I would say that the system does  
7 also improve one action at a time, that there are  
8 operations that are no longer certified, that we  
9 have actors that are no longer in the system.

10 And compliance is our number one goal,  
11 and so if we can get actors -- one revocation  
12 matters and one suspension matters because it is  
13 getting an actor out of the system, that should  
14 not be there.

15 Again, as I mentioned yesterday, these  
16 are very sophisticated actors. Many of them have  
17 actually worked in the industry, they know how it  
18 works.

19 They know how the paperwork flows,  
20 they know how to mark up documents, they know how  
21 things move between countries in a very complex  
22 system.

1                   And we are working with some very,  
2                   very sophisticated players out there.

3                   And so we're going to continue to  
4                   learn how they are working, and then try and get  
5                   ahead of them with system-wide improvements.

6                   But it will take time and it will take  
7                   everyone. I can't emphasize that enough.

8                   MR. RICE: Okay, Tom and then Lisa's  
9                   been waiting too.

10                  CHAIRMAN CHAPMAN: Yes, I had more  
11                  before we got into that back and forth. So, the  
12                  response is something that David asked about.

13                  Is there one item that can account for  
14                  90 percent?

15                  As far as I've spent time on this,  
16                  unfortunately, I don't think there is one item  
17                  that can carve out 90 percent of it.

18                  There's going to be a lot of actions  
19                  needed in a lot of different ways.

20                  Supply chains are very diverse and  
21                  they offer a lot of opportunities for fraud, and  
22                  this is an issue that is acute in the organic

1 industry but also extends far beyond it.

2           Something that comes to mind was a  
3 honey-laundering case, where they were shipping  
4 honey that was from illegal imports that resulted  
5 in FBI actions and a lot of arrests  
6 internationally.

7           But this happens in every commodity in  
8 a lot of different ways. Or we see a lot of  
9 allergens that get disclosed in spices because  
10 they've been adulterated.

11           So, fraud and food is an issue that's  
12 acute to organic, but it's also quite larger than  
13 that, and unfortunately, there's just dozens of  
14 ways to approach it.

15           So, I think we're going to have to  
16 take a good look at the supply chains and try to  
17 re-look at how it is and determine best ways to  
18 further mitigate that down.

19           Some of those might account for big  
20 portions of it, some of them might account for  
21 small portions of it.

22           We did get a lot of good comment from

1 OFARM, from Organic Gross Working Group, from  
2 OTA, and then OTA has a Working Group out there,  
3 and ACA has a Working Group on this.

4 We're getting a lot of good ideas and  
5 we need to start putting them together in a  
6 comprehensive plan to start addressing this.

7 The last point I want to make, which  
8 is really probably going to just be a preview to  
9 a request from the Subcommittee, but as we're  
10 digging into this, and as I was thinking about  
11 excluded operations before, really, we're looking  
12 at imports, but it's really supply chain  
13 integrity.

14 It was given to us as imports but  
15 this, while it might be acute and acknowledge  
16 that it's an international problem, there's no  
17 reason why it couldn't be a domestic problem as  
18 well.

19 Domestic, we have probably the easier  
20 enforcement authority, but it's still an issue  
21 present there.

22 So, it might make sense for us to

1       revise the work, still focusing on imports but  
2       maybe call it import and supply chain integrity,  
3       and then continue the work on that.

4                       That's all I had to say. That's all.

5                       MR. RICE: I got Lisa and then  
6       Harriet.

7                       MS. DE LIMA: So, I appreciate what  
8       Harriet brought up as far as how this impacts the  
9       consumer and the questions this raises in their  
10      minds.

11                      And I want to give you guys a  
12      perspective on how this impacts the retailer.

13                      So, just to give you one example, we  
14      got an email from a customer last week, and she  
15      was demanding to know what we, as MOM's Organic  
16      Market and Retailer, were doing to ensure that  
17      the organic product that we're selling is  
18      organic.

19                      I mean, so, take a minute to think  
20      about that, and that's crazy because we're not  
21      doing anything to ensure that organic is an  
22      organic.

1           We have a lot of standards in place  
2           and a lot of affidavits in place that we use for  
3           product that isn't certified organic.

4           So, an example would be we sell a fair  
5           amount of local pastured meat, and we go and  
6           visit the sites and put them through a lengthy  
7           affidavit process, asking them about feed and  
8           animal welfare and the whole bit.

9           But that's because the product isn't  
10          certified organic.

11          When it's certified organic, we're  
12          going on that trust as well as a retailer, but  
13          when we start to have customers asking questions  
14          like that, to me, that's a real big problem.

15          And there might be things that organic  
16          doesn't address, like porches for eggs, and  
17          that's something we do address, but that's when  
18          the organic standard isn't addressing something.

19          We will go in and set our own standard  
20          and ask the question, but just a general  
21          question, like what are you doing to ensure that  
22          your organic bread is organic because of the

1 grain?

2 It's a whole different ball game.

3 MR. RICE: Harriet?

4 MS. BEHAR: This is directed to the  
5 NOP. We've passed this proposal and so I know  
6 that economic impact is always something you have  
7 to address.

8 And so I would like to highly  
9 encourage you to consider the negative economic  
10 impact if it does not get put in place, that the  
11 integrity of the organic label is of paramount  
12 importance.

13 And so closing the loopholes in the  
14 supply chain audit trail is super important.

15 So, when you ENO and you are  
16 presenting to whoever looks at the ENO,  
17 understand all the layers you have to go through,  
18 but to please point out that -- usually, it's  
19 when you put something in the negative effect  
20 that it could have.

21 Well, let's talk about the positive  
22 effect and that if it doesn't get put into

1 guidance, how that could have a negative economic  
2 impact.

3 DR. TUCKER: Yes, great point. When  
4 the Department engages in any kind of rulemaking,  
5 I'll be sort of abstract about this, it looks at  
6 both quantitative benefits and quantitative  
7 costs.

8 And so I think, certainly, market  
9 growth is a quantitative indicator.

10 But I think if there are other types  
11 of quantitative indicators that can help both  
12 assess cost and benefit, benefits are always sort  
13 of hard to quantify for the Government.

14 And so if there are ways of thinking  
15 about benefits in addition to cost in  
16 quantitative ways, that always helps strengthen  
17 the argument.

18 And that's just a general generic  
19 comment about the rulemaking in general, not this  
20 in this particular.

21 Again, the administration is very  
22 interested in this issue and is supportive of

1 initiatives that will move that work forward.

2 MR. RICE: Emily?

3 MS. OAKLEY: I wanted to echo what  
4 Lisa and Harriet have said because trust is such  
5 a big factor in organics, both within what the  
6 farmers are doing and the consumer's trust of us.

7 And there's a wide range of consumers as we  
8 all know, but there's the emerging organic  
9 consumer, the person who buys a couple of things  
10 or every once in a while and is looking for  
11 reasons to believe further in the label.

12 And these are the types of issues that  
13 undercut their trust in the label and then become  
14 a reason to not become full-fledged organic  
15 consumers.

16 MR. RICE: I just wanted to add, also  
17 on the theme of communication of what's going on  
18 and how we can keep that line of communication  
19 going, there's been much greater communication  
20 amongst certifiers and certainly with the  
21 program.

22 But we've got the ability for us, as

1 certifiers, to share information or communicate  
2 with each other on various issues, and that has  
3 greatly improved in the time that I've been  
4 involved in this.

5 So, that's further adding some  
6 strength to this.

7 And further comments? Tom?

8 CHAIRMAN CHAPMAN: Yes, I've got one  
9 last one.

10 I do remember questions during the  
11 import panel about the responsibility of buying  
12 operations, and I work for a probably small in  
13 the size of CPG company, consumer product goods  
14 companies, but large in the realm of organic  
15 consumer product good companies.

16 And in my role at Cliff Bar, I am in  
17 charge of the ingredient sourcing Department, and  
18 we take integrity very important. It's top of  
19 mind, it's top of sourcing.

20 We pay a premium for organic  
21 ingredients and we expect that our supply chain  
22 is complying with the applicable requirements of

1 what we're paying for.

2 If there's fraud in our supply chain,  
3 then I'm outraged by any plan to take appropriate  
4 action.

5 And I think we've seen that also in  
6 comments from people like the Organic Produce  
7 Wholesalers Group and what they go through when  
8 they try to determine compliance of an operation  
9 and lost sales, potentially, from doing the right  
10 steps.

11 I think there's a lot of really good  
12 actors out there in the handling community that  
13 are doing the right things.

14 Unfortunately, fraudulent actors are  
15 fraudulent actors and they're not going to be  
16 here at the table.

17 They're not the ones here, so we're  
18 going to have to find ways to bring them in even  
19 if they're not here.

20 We need to bring the pain to the  
21 people who aren't coming to the table to help us  
22 solve this problem.

1           And I'm not saying that we don't have  
2 more actions in that, we definitely do, and we  
3 have a role in bringing the pain to those people  
4 to get the enforcement and integrity back where  
5 it's at.

6           Unfortunately, a lot of the imports  
7 that I saw coming in from the enforcement actions  
8 looked like feed grade, and so that spreads out  
9 probably a lot of small farmers unfortunately.

10           And it gets eaten by cows, and if  
11 you're buying the dairy products, it's going to  
12 be really hard to track something like that, even  
13 though it might be in someone's supply chain.

14           And that's just an example of how  
15 difficult this can be at different stages of the  
16 supply chain of how the fraud can get into a  
17 system.

18           But it doesn't at all take away from  
19 how important this is and how we need to tackle  
20 it right away.

21           DR. TUCKER: If I can just add one  
22 other thing that does -- your statement right

1       there.

2                   When I say all levels, we're talking  
3       about processers, we're talking about certifiers,  
4       we're talking about USDA, all levels have a role  
5       here.

6                   So, thank you for making that comment.

7                   MR. RICE:  Thanks everyone, I'm glad  
8       we did have the time to have this conversation  
9       and good to really get the input and feedback  
10      from the program.

11                  It's much appreciated.  That wraps up  
12      the business of the CACS Subcommittee and we'll  
13      turn it back to Tom.

14                  CHAIRMAN CHAPMAN:  Thank you, Scott.  
15      My agenda says it's time for a recess and free  
16      beer with Marty.

17                  (Laughter.)

18                  It's 10:00 a.m.  It's the livestock,  
19      can we get started on the livestock or should we  
20      take a recess?  Want to take a break?

21                  Let's get started with the livestock  
22      first.  Maybe we'll get through the sunset and

1 we'll see how long it takes.

2 That was a joke because of the agenda.  
3 Sorry, my jokes aren't that funny. That was the  
4 end Wednesday right there.

5 So, it's now Thursday morning, 8:30  
6 a.m., and we're going to move onto the Livestock  
7 Subcommittee. And I'm going to hand it over to  
8 Ashley Swaffar, the Chair.

9 MS. SWAFFAR: Okay, we're going to try  
10 to make some time up in livestock. So, let's  
11 start off and jump right into Sunset 2017.

12 Dr. Brines?

13 DR. BRINES: All right, thank you.

14 As we start the livestock sunset  
15 materials, we're at section 205603 of the  
16 National List, synthetic substances allowed for  
17 use in organic livestock production.

18 The first substance on the agenda is  
19 chlorhexidine or chlorhexidine.

20 It appears under paragraph as  
21 disinfectants, sanitizer, and medical treatments  
22 as applicable.

1                   And the listing is chlorhexidine  
2                   allowed for surgical procedures conducted by a  
3                   veterinarian, allowed for uses of teat dip when  
4                   alternative germicidal agents and or physical  
5                   barriers have lost their effectiveness.

6                   And the most recent technical report  
7                   was completed in 2015. Thanks.

8                   MS. SWAFFAR: Thank you, Dr. Brines.  
9                   Harriet?

10                  MS. BEHAR: So, numerous certification  
11                  agencies noted that this is an important material  
12                  for organic livestock production.

13                  There was a checklist that went around  
14                  and there were a lot of individual farmers who  
15                  also checked wanting this product to be relisted.

16                  It's very useful as the active  
17                  disinfected in a teat dip, especially in cold  
18                  temperatures, and coming from Wisconsin and doing  
19                  inspections in Minnesota, I can say that many  
20                  farmers really prefer this, especially in the  
21                  cold months, to iodine as a teat dip.

22                  The use of it in surgical procedures

1 is absolutely essential. And even though one  
2 public interest group did note that there were  
3 less toxic alternatives such as vinegar or  
4 lavender oil, or others, this is readily  
5 available and is approved for use in livestock  
6 production.

7 So, the Subcommittee voted to relist  
8 this material for the specific functions in the  
9 annotation and the vote was 7-2, no, to not  
10 relist. And zero to take it off the list.

11 Did I say that right? I had many  
12 negatives in there.

13 MS. SWAFFAR: Thank you, Harriet. Is  
14 there any discussion? I see none. We're ready  
15 to vote.

16 CHAIRMAN CHAPMAN: I'm getting there.  
17 All right, so it's a motion to remove  
18 chlorhexidine from 205603A.

19 The motion was made by Harriet and  
20 seconded by Ashley. This is a motion to remove,  
21 so a yes-vote is to remove, a no-vote is to  
22 retain the listing.

1 Voting will start with Lisa.

2 MS. DE LIMA: No.

3 MR. BRADMAN: No.

4 MS. MOSSO: No.

5 MR. ELA: No.

6 MR. MORTENSEN: No.

7 MR. BUIE: No.

8 MS. SWAFFAR: No.

9 DR. SEITZ: No.

10 MR. RICE: No.

11 MS. BAIRD: No.

12 MS. BEHAR: No.

13 MS. OAKLEY: No.

14 DR. THICKE: No.

15 MS. BRIONES: No.

16 CHAIRMAN CHAPMAN: Chair votes no. 0,  
17 yes; 15, no. The motion fails.

18 MS. SWAFFAR: Okay, moving right along  
19 to chlorine, Dr. Brines?

20 DR. BRINES: Thank you, we'll take up  
21 all the chlorine materials as a single  
22 introduction.

1                   So, we're continuing under Section  
2                   205603 paragraph A, and the listing is chlorine  
3                   materials, disinfecting and sanitizing facilities  
4                   and equipment.

5                   Residual chlorine levels in the water  
6                   shall not exceed the maximum residual  
7                   disinfectant limit under the Safe Drinking Water  
8                   Act.

9                   And we have calcium hypochlorite,  
10                  chlorine dioxide, and sodium hypochloride.

11                  MS. SWAFFAR: Thanks. Thank you, Dr.  
12                  Brines, this is my material. I feel like I talk  
13                  about chlorine every single meeting, so I'm going  
14                  to kind of keep it pretty brief.

15                  Chlorine is used as a sanitizer and  
16                  disinfectant in a lot of areas in livestock  
17                  production from sanitizing surfaces, pails, water  
18                  lines, things like that.

19                  Some of the comments were there are  
20                  very few alternatives and there are farmers who  
21                  use chlorine as there preferred cleaner and  
22                  sanitizer and if it was removed, it would have a

1 profound effect on the dairy industry.

2 A lot of folks said it was routinely  
3 used it kill pathogens, and we did get some  
4 comments, again, that it has a risk to human  
5 health and we should look at a comprehensive  
6 review of sanitizers, which fingers crossed, we  
7 might be looking at that.

8 So, we talked about this a lot so I'm  
9 going to end it there.

10 Any discussion? Great, ready to vote.

11 CHAIRMAN CHAPMAN: Okay, these  
12 materials all came bundled together.

13 So, it's again a motion to remove  
14 chlorine materials from 205603A, that's all three  
15 of the materials.

16 The motion was made by Ashley and  
17 seconded by Sue.

18 It's a motion to remove so a yes-vote  
19 is to remove, a no-vote is to retain, and the  
20 voting will start with Asa.

21 MR. BRADMAN: No.

22 MS. MOSSO: No.

1 MR. ELA: No.

2 MR. MORTENSEN: No.

3 MR. BUIE: No.

4 MS. SWAFFAR: No.

5 DR. SEITZ: No.

6 MR. RICE: No.

7 MS. BAIRD: No.

8 MS. BEHAR: No.

9 MS. OAKLEY: No.

10 DR. THICKE: No.

11 MS. BRIONES: No.

12 MS. DE LIMA: No.

13 CHAIRMAN CHAPMAN: Chair votes no. 0,  
14 yes; 15, no. The motion fails.

15 MS. SWAFFAR: Okay, moving right  
16 along, glucose. Dr. Brines?

17 DR. BRINES: Thank you. We're still  
18 under Section 205603, Paragraph A, and the  
19 listing is glucose. Thanks.

20 MS. SWAFFAR: Thank you, Dr. Brines.  
21 Harriet, keep it brief?

22 MS. BEHAR: Okay, so this is also

1 another material universally used. Many  
2 producers as well as certifiers support it.

3 It's used in ketosis as well as is an  
4 ingredient in calcium gluconate, which is used  
5 for milk fever.

6 So, a very useful and welcome item on  
7 the National List by our organic livestock  
8 partners.

9 The vote by the Subcommittee was 7 to  
10 retain it and 0 to remove.

11 MS. SWAFFAR: Thank you, Harriet. Is  
12 there any further discussion? Seeing none, we're  
13 ready to vote.

14 CHAIRMAN CHAPMAN: Okay, this is a  
15 motion to remove glucose from 205603A. The  
16 motion was made by Harriet and seconded by Sue.

17 This is a motion to remove; a yes-vote  
18 is to remove, a no-vote is to retain. And the  
19 voting will start with Joelle.

20 MS. MOSSO: No.

21 MR. ELA: No.

22 MR. MORTENSEN: No.

1 MR. BUIE: No.

2 MS. SWAFFAR: No.

3 DR. SEITZ: No.

4 MR. RICE: No.

5 MS. BAIRD: No. Did I skip?

6 MS. BEHAR: No.

7 MS. OAKLEY: No.

8 DR. THICKE: No.

9 MS. BRIONES: No.

10 MS. DE LIMA: No.

11 MR. BRADMAN: No.

12 CHAIRMAN CHAPMAN: Chair votes no. 0,  
13 yes; 15, no. The motion fails.

14 MS. SWAFFAR: All right, moving onto  
15 oxytocin. Dr. Brines?

16 DR. BRINES: Thank you, we're still  
17 under Section 205603, Paragraph A, and the  
18 listing is oxytocin use in post parturition  
19 therapeutic applications.

20 The most recent technical report was  
21 completed in 2005. Thanks.

22 MS. SWAFFAR: Harriet, once again?

1 MS. BEHAR: Okay, oxytocin. So, this  
2 has been voted by the Subcommittee to remove.

3 It is a hormone that has an annotation  
4 for post-parturition use therapeutic application  
5 only.

6 Many commenters in both the first  
7 review and the second review did mention that it  
8 seemed to be an unclear annotation, that there  
9 are chances for abuse.

10 However, and there were many  
11 checklists where farmers just checked that they  
12 wanted to keep it.

13 But in further detail with certifiers  
14 and during our public comment here, it was  
15 mentioned that they liked to have it in their  
16 toolbox but they don't use it.

17 And that I think when it was first put  
18 on, I went back to the first tack and it's been  
19 on the list for a long time.

20 It has not really had a very robust  
21 discussion over time, it just kind of kept  
22 getting renewed.

1           But over time, the dairy has set work  
2 with organic dairy producers, farmers have really  
3 developed both management protocols so they don't  
4 have post-birthing problems, as well as how to  
5 treat it, either manually or with homeopathics or  
6 with herbs.

7           There's just a variety of different  
8 ways of dealing with the issues, that they really  
9 are not using it.

10           The two largest milk buyers in the  
11 United States are Crop Cooperative Organic Valley  
12 and WhiteWave Danone. I hope I've got that  
13 right.

14           They did not support renewal of this  
15 material, nor did the Organic Trade Association.

16           Numerous commenters really felt that  
17 because it's a hormone it should be removed, and  
18 so I'm going to just read the Northeast Organic  
19 Dairy Producers Association, the recommendation  
20 what they say about it.

21           Because they do represent many organic  
22 dairy farmers in the country. They support the

1 Subcommittee's recommendation to remove oxytocin  
2 from the National List.

3 Oxytocin is a protein hormone, not a  
4 body- building steroid hormone. It occurs in all  
5 mammals, both male and female.

6 The word hormone is misunderstood by  
7 consumers, and as such, leaves organic dairy  
8 producers open to the valid claim that hormones  
9 are allowed for use.

10 Oxytocin is not an essential material  
11 for organic production.

12 If an organic dairy operation suffers  
13 from repeated occurrences of prolapsed uterus,  
14 underlying issues such as hypocalcemia need to be  
15 addressed.

16 Prolapsed uterus should be a rare  
17 occurrence on organic farms and if oxytocin is  
18 indeed needed to treat this rare occurrence, then  
19 the animal would need to be removed from the herd  
20 as with treatment with any other prohibited  
21 substance.

22 And so that is what a group of organic

1 dairy farmers have said about this material.

2 Oh, and the vote was 7 to remove, 0  
3 no, and 0 abstentions.

4 So, it was a unanimous vote by the  
5 Subcommittee to remove this from the National  
6 List.

7 MS. SWAFFAR: Thank you, Harriet.  
8 We'll open that up for discussion starting with  
9 Francis.

10 DR. THICKE: I also was impressed that  
11 Organic Valley, Horizon, Straus Dairy, and a lot  
12 of organizations, supported removing it,  
13 including NODPA, basically, most of the  
14 organizations that represent most of the organic  
15 milk.

16 And the idea that it's a synthetic  
17 hormone is something that I think they see as not  
18 good to further label.

19 And I definitely support removing this  
20 product from the National List. I think it's  
21 time.

22 MS. SWAFFAR: Anybody else? Harriet?

1 MS. BEHAR: So, if you have an  
2 opinion, instant facts. I agree there, I don't  
3 think it's needed.

4 And in discussion with people in  
5 Europe about our prohibition on antibiotics and  
6 all the tools that we have learned over time that  
7 we don't need them in organic livestock  
8 production. Whereas, they do allow them.

9 I think this is another place where  
10 removing it from the toolbox will just encourage  
11 our organic dairy producers to look to those  
12 natural systems instead and actually find success  
13 with those tools, instead of having this  
14 synthetic there.

15 Which really most people just said  
16 keep it in the toolbox but I probably won't use  
17 it.

18 I think we just take it out of the  
19 toolbox.

20 MS. SWAFFAR: So I just want to  
21 comment, I understand that it's really important  
22 to give our producers a lot of tools in their

1 toolbox, and generally, I always feel like we  
2 should give them what they need. But hearing  
3 from so many large-theory organizations that  
4 there are alternatives that have been working,  
5 and that two of the largest organic dairy folks  
6 in the U.S. don't even allow this as an input --  
7 that kind of hit that one home to me.

8 So that's how I will be voting. Any  
9 other discussion? Great, we're ready to vote;  
10 Tom?

11 CHAIRMAN CHAPMAN: This is a motion to  
12 remove Oxytocin from 205.603(a), based on the  
13 following criteria in the Organic Foods  
14 Production Act, Section 2118, National List  
15 (b)(1)(A)(ii) and (iii), Section 2119, and/or 7  
16 CFR 205.600(b)(1): essentiality.

17 The motion was made by Harriet and  
18 seconded by Ashley. A yes vote is to remove, a  
19 no vote is to retain, and the voting will start  
20 with Steve.

21 MR. ELA: Yes.

22 MR. MORTENSEN: Yes.

1 MR. BUIE: Yes.

2 MS. SWAFFAR: Yes.

3 DR. SEITZ: Yes.

4 MR. RICE: Yes.

5 MS. BAIRD: Yes.

6 MS. BEHAR: Yes.

7 MS. OAKLEY: Yes.

8 DR. THICKE: Yes.

9 MS. BRIONES: Yes.

10 MS. DE LIMA: Yes.

11 MR. BRADMAN: Yes.

12 MS. MOSSO: Yes.

13 CHAIRMAN CHAPMAN: Chair votes yes.

14 Fifteen yes, zero no; the motion passes.

15 MS. SWAFFAR: All right; copper  
16 sulphate; Dr. Brines? Or, no, no; I'm sorry.  
17 Tolazoline, Dr. Brines.

18 DR. BRINES: Yes, all right. So we're  
19 continuing on under 205.603(a); this listing is  
20 tolazoline, CAS No. 59-98-3. Federal law  
21 restricts this drug first to use by or on the  
22 lawful written or oral order, or the licensed

1 veterinarian, in full compliance with the AMDUCA,  
2 and 21 CFR part 530 of the Food and Drug  
3 Administration regulations.

4 Secondly, for use under 7 CFR Part  
5 205, the NOP requires one use by or on the lawful  
6 written order of a licensed veterinarian to use  
7 only to reverse the effects of sedation and  
8 analgesia cause by Xylazine.

9 Thirdly, a meat-withdrawal period of  
10 at least eight days after administering to  
11 livestock intended for slaughter, and a milk  
12 discard period of at least four days after  
13 administering dairy animals.

14 The most recent technical report was  
15 completed in 2002. Thanks.

16 MS. SWAFFAR: Thank you; Dan?

17 DR. SEITZ: So as Dr. Brines just  
18 pointed out, this substance has a very narrow  
19 use, and it's just to reverse the effects of the  
20 veterinary medicine Xylazine.

21 This was just reviewed in 2015, so  
22 we're reviewing it again because of the speeded-

1 up process to spread out the sunset materials.  
2 There were only a few comments on this, four  
3 comments. They all supported relisting.

4 There was a concern raised by two  
5 commenters regarding off-label use, but as you  
6 can see, we have very specific annotation. So  
7 any off-label use would really be an issue with a  
8 certifier.

9 So in general, very little comment,  
10 but the comment that was received said that this  
11 should be kept on as a necessary veterinary  
12 medicine.

13 We did have a subcommittee vote on  
14 this, and five people voted no, meaning that it  
15 should stay on the list; there were two absent,  
16 and there were no votes to remove this.

17 MS. SWAFFAR: Thank you, Dan. Is  
18 there any discussion? Yes, Francis.

19 DR. THICKE: I would just point out,  
20 it's unfortunate that this was not paired with  
21 Xylazine for the review process, because we can't  
22 really work with one without the other, so it's

1 going to be awkward from here on, that we're  
2 always going to refer to the other drug, so we  
3 can't take action; not that I wanted to take  
4 action on it. I'm in favor of keeping it on the  
5 list.

6 DR. SEITZ: Let me just say that if we  
7 do take action on the other material, then we  
8 could remove this material. But it wouldn't make  
9 sense to remove this first.

10 MS. SWAFFAR: Any other discussion?

11 All right, we're ready to vote. Tom?

12 CHAIRMAN CHAPMAN: Okay; this is a  
13 motion to remove tolazoline from 205.603(a). The  
14 motion was made by Dan and seconded by Jesse.  
15 It's a motion to remove, so a yes vote is to  
16 remove, a no vote is to retain. The voting will  
17 start with Dave.

18 MR. MORTENSEN: No.

19 MR. BUIE: No.

20 MS. SWAFFAR: No.

21 DR. SEITZ: No.

22 MR. RICE: No.

1 MS. BAIRD: No.

2 MS. BEHAR: No.

3 MS. OAKLEY: No.

4 DR. THICKE: No.

5 MS. BRIONES: No.

6 MS. DE LIMA: No.

7 MR. BRADMAN: No.

8 MS. MOSSO: No.

9 MR. ELA: No.

10 CHAIRMAN CHAPMAN: Chair votes no.

11 Zero yes, 15 no; the motion fails.

12 MS. SWAFFAR: Thanks. One thing  
13 before we move on; on the oxytocin, where we  
14 voted to remove; the sunset date for that is  
15 March 15th of 2022, I believe, Dr. Brines. So  
16 that is one that we did early, so it's not  
17 immediately sunseting. Is that right, 2022?

18 Okay, moving on to copper sulfate; Dr.  
19 Brines?

20 DR. BRINES: Thank you; we're under a  
21 new paragraph of Section 205.603; it's paragraph  
22 (b), as topical treatment, external parasiticide

1 or local anesthetic as applicable. And the  
2 listing is copper sulfate. The most recent  
3 technical report was completed in 2015. Thank  
4 you.

5 MS. SWAFFAR: Thank you, Dr. Brines.  
6 Jesse?

7 MR. BUIE: Copper sulfate is used in  
8 livestock management, specifically as a walk-  
9 through foot bath to help control and prevent  
10 foot-related diseases in dairy cattle and sheep.

11 According to the February 15th  
12 technical evaluation report commissioned by the  
13 livestock committee, there are no natural non-  
14 synthetic products available that can be used as  
15 a management strategy to treat hoof-related  
16 diseases and lameness in dairy cattle and sheep  
17 operations.

18 The Livestock Subcommittee feels that  
19 copper sulfate, when used with appropriate  
20 management practices and disposed of properly,  
21 provides a valuable tool to livestock producers  
22 and recommends this material to stay on the

1 national list.

2           There were a few comments received,  
3 but most were for relisting. Several were for  
4 more research and recommendations for  
5 alternatives. There were seven no votes.

6           MS. SWAFFAR: Thank you, Jesse; I'll  
7 open the floor up. Lisa?

8           MS. DE LIMA: I just have a question  
9 for you guys; there were a couple of commenters  
10 who wanted an annotation similar to crops, and I  
11 just wanted to know, from the livestock  
12 committee's perspective, is that just less of an  
13 issue when it comes to livestock, because it's  
14 not being used directly in the soil?

15           MS. SWAFFAR: So I'm not 100 percent  
16 sure; I think the annotation was around disposal,  
17 maybe.

18           MS. DE LIMA: Used and disposed of in  
19 a manner that minimizes accumulation in the soil.

20           MS. SWAFFAR: Yes; what they're  
21 concerned about there is folks having a foot  
22 bath, and then just dumping it out on the ground.

1 So that's why we said that if it's used  
2 appropriately and disposed of appropriately.

3 So we can take that back to committee  
4 and talk about that on -- no, it was brought up  
5 by a commenter, so usually we talk about that.

6 MR. BUIE: And the research shows that  
7 there haven't been any issues.

8 MS. SWAFFAR: Harriet?

9 MR. MORTENSEN: Yes, I was just  
10 curious for the folks who reviewed it, or maybe  
11 Francis; what is proper disposal of a bath like  
12 that?

13 DR. THICKE: I think -- I don't use  
14 these baths. I'm thinking that it probably gets  
15 dumped in the manure pit, and then it gets put on  
16 the land. I hope they don't just dump it on the  
17 land somewhere and concentrate it more.

18 But there are alternatives. I mean,  
19 most grazing dairy farmers will not use a foot  
20 bath. And if you have an isolated foot problem,  
21 you just treat it topically; clean it up and  
22 treat it topically. The foot baths are more for

1 the capel dairies.

2 MS. SWAFFAR: Harriet?

3 MS. BEHAR: There can also be just  
4 regional differences too, or seasonal; if it's  
5 very muddy or whatever, you might need a foot  
6 bath.

7 But we have also approved zinc  
8 sulfate, and there is a petition before us, so we  
9 will be looking at in the spring for thymol.  
10 This could even be a research priority, natural  
11 alternatives.

12 I don't know if there have been any  
13 studies on things like tea tree oil or other  
14 things that might be useful, just to lessen  
15 copper use in organic systems overall. But I  
16 will vote for this material now, because we don't  
17 have all those alternatives.

18 MS. SWAFFAR: Sue, did you have your  
19 hand up?

20 MS. BAIRD: I think I have to disagree  
21 with my friend, Francis. I do a lot of  
22 inspections, especially smaller, Amish

1 Mennonites, and many of them are using the foot  
2 bath.

3 MS. SWAFFAR: Any other discussion?  
4 Okay, I think we're ready to vote.

5 CHAIRMAN CHAPMAN: Okay, so this is a  
6 motion to remove copper sulfate from 205.603(b)  
7 as a topical treatment, external parasiticide or  
8 local anesthetic. The motion came from Jesse,  
9 and was seconded by Harriet. It's a motion to  
10 remove, so a yes vote is to remove, a no vote is  
11 to retain. And the voting will start with Jesse.

12 MR. BUIE: No.

13 MS. SWAFFAR: No.

14 DR. SEITZ: No.

15 MR. RICE: No.

16 MS. BAIRD: No.

17 MS. BEHAR: No.

18 MS. OAKLEY: No.

19 DR. THICKE: No.

20 MS. BRIONES: No.

21 MS. DE LIMA: No.

22 MR. BRADMAN: No.

1 MS. MOSSO: No.

2 MR. ELA: No.

3 MR. MORTENSEN: No.

4 CHAIRMAN CHAPMAN: The chair votes no.  
5 Zero yes, 15 no, the motion fails.

6 MS. SWAFFAR: All right, moving on to  
7 lidocaine; Dr. Brines?

8 DR. BRINES: Thank you; we're still  
9 under paragraph (b), and the listing is lidocaine  
10 as a local anesthetic. Use requires a withdrawal  
11 period of 90 days after administering to  
12 livestock intended for slaughter, and seven days  
13 after administering to dairy animals. Thanks.

14 MS. SWAFFAR: All right, Dan.

15 DR. SEITZ: So a little more  
16 background on the substance; lidocaine is a local  
17 anesthesia which has a rapid onset of action, and  
18 is short-term in duration. It numbs only the  
19 area to be worked on.

20 For example, lidocaine is used to  
21 humanely debud horns on calves and for minor  
22 surgery on mature animals. It was last reviewed

1 in 2015, so again this is part of this speeded-up  
2 process.

3 Subsequently, the withdrawal period  
4 was changed through an annotation, but that's not  
5 something we're looking at. It was shortened;  
6 that happened in 2016.

7 There were seven comments in favor  
8 that supported the relisting the material; there  
9 was no opposition. And generally, this is seen  
10 as being something that's very useful for  
11 livestock veterinary treatment.

12 So the subcommittee voted zero yes,  
13 five no, zero abstentions, two absent; so  
14 basically voted to keep it on the list.

15 MS. SWAFFAR: Thank you. Is there any  
16 discussion? Harriet?

17 MS. BEHAR: This is important material  
18 for animal welfare.

19 MS. SWAFFAR: And I just wanted to  
20 clarify that what Dan talked about, the  
21 withholding period; that was a proposal from the  
22 board, and the program has not officially put

1 that into rulemaking yet. So we're still at the  
2 90. Yes, Francis.

3 DR. THICKE: I would agree that it's  
4 important to keep it on the list.

5 MS. SWAFFAR: Further discussion?

6 MR. MORTENSEN: I was wondering if  
7 someone, just for clarification -- the slaughter  
8 interval is 90 days, and the milking interval is  
9 eight days. I'm surprised by such a large  
10 difference, that there wouldn't be residues in  
11 the milk. Anybody know anything about that?

12 MS. SWAFFAR: Francis?

13 DR. THICKE: When we reviewed those  
14 withholding times, Jean Richardson took the lead,  
15 and we looked at AMDUCA and the requirements from  
16 the FDA, and we doubled them, if my memory is  
17 right. And so it doubled what the requirement  
18 was from the FDA, if I remember right.

19 MR. MORTENSEN: Okay.

20 MS. SWAFFAR: That's right. Emily?

21 MS. OAKLEY: What are we going to do  
22 when we don't have Francis?

1 MS. SWAFFAR: I am not happy. I think  
2 he's going to stay another five years. I need my  
3 dairy person. Any other discussion? Okay, we're  
4 ready to vote.

5 CHAIRMAN CHAPMAN: The motion is to  
6 remove lidocaine from 206.603(b). The motion was  
7 made by Dan, seconded by Francis. This is a  
8 motion to remove, so a yes vote is to remove, a  
9 no vote is to retain. The voting will start with  
10 Ashley.

11 MS. SWAFFAR: No.

12 DR. SEITZ: No.

13 MR. RICE: No.

14 MS. BAIRD: No.

15 MS. BEHAR: No.

16 MS. OAKLEY: No.

17 DR. THICKE: No.

18 MS. BRIONES: No.

19 MS. DE LIMA: No.

20 MR. BRADMAN: No.

21 MS. MOSSO: No.

22 MR. ELA: No.

1 MR. MORTENSEN: No.

2 MR. BUIE: No.

3 CHAIRMAN CHAPMAN: Chair votes no.

4 Zero yes, 15 no; the motion fails.

5 MS. SWAFFAR: All right, and on to  
6 procaine. Dr. Brines?

7 DR. BRINES: Yes, thank you. We're  
8 still under paragraph (b), and the listing is  
9 procaine as a local anesthetic. Use requires a  
10 withdrawal period of 90 days after administering  
11 to livestock intended for slaughter, and seven  
12 days after administering to dairy animals.

13 Thanks.

14 MS. SWAFFAR: Thank you. Dan?

15 DR. SEITZ: So like lidocaine,  
16 procaine is a local anesthetic which has a rapid  
17 onset of action, and is of short-term duration.  
18 It numbs only the area to be worked on, and can  
19 be used to humanely debud horns on calves and for  
20 minor surgery.

21 This also was last reviewed in 2015,  
22 and similar to lidocaine, subsequently there was

1 a proposal for an annotation change, to lower the  
2 withdrawal period.

3 Unlike lidocaine, there were a number  
4 of questions raised about procaine. There were  
5 seven comments altogether that were received this  
6 time around. One comment stated that it is  
7 currently being used; one comment explicitly  
8 recommended continued listing.

9 However, several commenters noted that  
10 procaine may be commonly combined with  
11 antibiotics. If you Google procaine, you'll find  
12 that many products come up that are listed as  
13 combining it with an antibiotic.

14 Apparently -- and this was from a  
15 couple commenters -- this is not commercially  
16 available in an organic-compliant form, and the  
17 FDA has also withdrawn a number of procaine  
18 products from its approval.

19 So I would say that a majority of the  
20 commenters felt either that there were issues  
21 around whether it is always combined with  
22 antibiotics, whether it's available, and whether

1 it's really a useful thing to have in their  
2 toolbox, when you consider lidocaine tends to be  
3 a more effective and widely-used substance.

4 So we had a split vote on the  
5 subcommittee level, with three members voting  
6 yes, suggesting that it be delisted. Two voted  
7 no, saying that it should be relisted, and two  
8 were absent.

9 MS. SWAFFAR: Thank you, Dan. We'll  
10 open the floor for discussion. Harriet?

11 MS. BEHAR: Because there's nothing  
12 commercially available in an organically-  
13 acceptable form, and we do have lidocaine present  
14 to perform the same task, I will be voting to  
15 remove this material.

16 MS. SWAFFAR: Okay, any other  
17 discussion? Dave?

18 MR. MORTENSEN: I think Harriet  
19 answered most of my question, but I was curious  
20 about a couple of the other hinge issues that led  
21 people to vote for and against this. Dan, could  
22 you give us insight into that?

1 DR. SEITZ: I think the yes votes  
2 reflected Harriet's thinking. A no vote was that  
3 it was just another tool that may be helpful. It  
4 wasn't absolutely certain that it couldn't be  
5 found in a form that was without an antibiotic  
6 attached to it. So probably just the idea of no  
7 harm done in leaving it.

8 MS. SWAFFAR: So I'd like to follow up  
9 to that. I think it was more of, Let's see if we  
10 can get more public comment out this, to see if  
11 there truly wasn't a form that didn't contain  
12 antibiotics. So that's kind of where that split  
13 vote came out. Francis?

14 DR. THICKE: Yes, I'm also in favor of  
15 removing it. Lidocaine seems to be as effective  
16 or more effective, and commonly in use.

17 The biggest issue for me is that, in  
18 many areas of the country, there aren't really  
19 veterinarians who are familiar with organics.  
20 And when they say they'll bring procaine, then  
21 they'll just grab procaine. That's what they do;  
22 they treat animals with drugs.

1                   So they'll grab procaine and use  
2                   antibiotics with it. So there could be this  
3                   confusion, and unintentionally get antibiotics  
4                   into an animal.

5                   MS. SWAFFAR: Any other discussion?

6                   MR. RICE: I just have a question in  
7                   terms of -- I saw that CROPP Organic Valley was  
8                   in support of letting this go. But then VOF,  
9                   Vermont Organic, said their producers use it as a  
10                  general.

11                  Is it explicitly used with an  
12                  antibiotic, or can it be used without? I was a  
13                  little confused about that.

14                  MS. SWAFFAR: Francis?

15                  DR. THICKE: I've not seen any  
16                  reference that it's actually available without  
17                  antibiotic; we've been looking for that. And  
18                  also, it's used in the outpatient as a local  
19                  anesthetic like lidocaine, so it's really the  
20                  same usage as lidocaine.

21                  MS. SWAFFAR: Harriet?

22                  MS. BEHAR: And not just the thought

1 of an antibiotic in the milk supply, but an  
2 unsuspecting producer who's working with a  
3 veterinarian who doesn't understand the organic  
4 regulation could lose a valuable animal in their  
5 herd.

6 And for livestock people, it's not  
7 just about production; it's about genetics, so we  
8 want to make sure the genetics that they're  
9 trying to retain and build upon in their herds  
10 are not going to be accidentally treated with  
11 something that could take it out of production.

12 MS. SWAFFAR: Thank you. Tom?

13 CHAIRMAN CHAPMAN: I just wanted to  
14 make sure I didn't miss something in the public  
15 comment. Did anyone comment specifically, saying  
16 they could get it without the antibiotic? Did we  
17 get anything directly?

18 DR. SEITZ: I did not see that comment  
19 anywhere.

20 CHAIRMAN CHAPMAN: I didn't see it  
21 either; I'm just trying to check.

22 MS. SWAFFAR: A-dae?

1 MS. BRIONES: I don't know if anybody  
2 can answer this question, but if a producer uses  
3 procaine -- why would a producer use procaine  
4 instead of lidocaine? Is there --

5 MS. SWAFFAR: Harriet?

6 MS. BEHAR: Well, the concern is that  
7 if there's a veterinarian on the farm, and they  
8 see a list that just says, procaine, then they  
9 would just pull that out of their tool if there's  
10 a minor surgery that they're performing.

11 They wouldn't necessarily think to  
12 look at the ingredients of the procaine, to make  
13 sure there were no antibiotics, especially if  
14 they were not familiar with organic regulations.  
15 They wouldn't know that the antibiotic could then  
16 make that animal no longer suitable for organic  
17 production.

18 MS. SWAFFAR: So I'm going to call on  
19 myself; as best I can tell, the two are  
20 interchangeable, lidocaine and procaine, as far  
21 as their use. Tom?

22 CHAIRMAN CHAPMAN: Is there

1 availability difference between the two? Was  
2 that a reason, originally?

3 MS. SWAFFAR: Francis?

4 DR. THICKE: I'm not certain. I know  
5 lidocaine is widely available and widely used.

6 MS. SWAFFAR: Emily?

7 MS. OAKLEY: If we should vote to  
8 remove this substance, would the cover letter for  
9 its removal state that there were no known  
10 products available that did not include the  
11 antibiotics? I think that might help explain the  
12 situation, especially the smaller-scale producers  
13 who might not understand that.

14 MS. SWAFFAR: That's a great point to  
15 throw on there, and I'll make a note of that, for  
16 sure. Any other -- Sue?

17 MS. BAIRD: I was one that voted yes  
18 on it, and I did it simply because I was hoping  
19 that we would get further clarification, whether  
20 it was available without the antibiotics. I  
21 really hate taking tools away, but if it's not  
22 available, then I'm absolutely going to vote

1       against that now. I'm going to vote no.

2                   MS. SWAFFAR: You mean yes? Yes is to  
3       remove.

4                   CHAIRMAN CHAPMAN: You're going to  
5       vote to sunset?

6                   MS. BAIRD: Yes.

7                   MS. SWAFFAR: Any other discussion?  
8       All right, looks like we're ready to vote, Tom.

9                   CHAIRMAN CHAPMAN: All right. Before  
10       I get into the voting, because this was a split  
11       motion, real quick; Dr. Brines, I'm going to put  
12       you on the spot again. What is the original  
13       sunset date for this material?

14                   DR. BRINES: The sunset date for  
15       procaine is March 15th, 2022, and as part of the  
16       sunset reorganization, the board recommended that  
17       materials reviewed early not sunset prior to the  
18       original date.

19                   CHAIRMAN CHAPMAN: Correct, so there's  
20       also that time, as well, for folks to comment in,  
21       if there's something we're unaware of.

22                   All right, so the motion to remove

1       procaine from 205.603(b) is based on the  
2       following criteria: the Organic Foods Production  
3       Act and/or 7 CFR 205.600(b). If applicable, the  
4       reason given is essentiality.

5               The motion is made by Dan, seconded by  
6       Sue. This is a motion to remove, so a yes vote  
7       is to remove, a no vote is to retain, and the  
8       voting will start with Dan.

9               DR. SEITZ: Yes.

10              MR. RICE: Yes.

11              MS. BEHAR: Yes.

12              MS. OAKLEY: Yes.

13              DR. THICKE: Yes.

14              MS. BRIONES: Yes.

15              MS. DE LIMA: Yes.

16              MR. BRADMAN: Yes.

17              MS. MOSSO: Yes.

18              MR. ELA: Yes.

19              MR. MORTENSEN: Yes.

20              MR. BUIE: Yes.

21              MS. SWAFFAR: Yes.

22              CHAIRMAN CHAPMAN: Chair votes yes.

1 MS. SWAFFAR: Can we get clarification  
2 from Sue?

3 CHAIRMAN CHAPMAN: Sue, we couldn't  
4 hear your vote. Can you vote again?

5 MS. BAIRD: I said no.

6 CHAIRMAN CHAPMAN: Fourteen yes, one  
7 no; the motion passes.

8 So we're going to take a break now;  
9 it's 10:30. We'll come back into session in 15  
10 minutes, at 10:45.

11 Just a note, we found these glasses;  
12 has someone lost a pair of glasses, or know who  
13 these belong to? I'm going to put them over by  
14 Michelle, but come find them if they're yours.

15 DR. TUCKER: We also found a small  
16 black button.

17 CHAIRMAN CHAPMAN: A small black  
18 button; so if you're missing a button, come find  
19 us too.

20 (Whereupon, the above-entitled matter  
21 went off the record at 10:31 a.m. and resumed at  
22 10:47 a.m.)

1                   CHAIRMAN CHAPMAN: Members of the  
2 board can return to their seats; members of the  
3 public finish their conversations.

4                   All right, we're going to get started  
5 back up now. We're still on livestock agenda, so  
6 I'm going to hand it back to Ashley.

7                   MS. SWAFFAR: Starting with sulfur,  
8 Dr. Brines, you want to introduce it?

9                   DR. BRINES: Yes, thank you. I'm  
10 happy to introduce the petition. This petition  
11 for sulfur was received by the program on March  
12 1st, 2016, and was submitted by Landis  
13 International, Incorporated. The petition  
14 requests the addition of sulfur to Section  
15 205.603 of the national list.

16                   There was a technical evaluation  
17 report that was prepared in response to the  
18 request from the Livestock Subcommittee for this  
19 material. Sulfur has also been previously  
20 classified by the board as a synthetic substance.  
21 Thanks.

22                   MS. SWAFFAR: Thank you, Dr. Brines.

1 A-dae?

2 MS. BRIONES: Yes, so the petition is  
3 for sulfur to be used in livestock production, as  
4 a livestock parasiticide. It's currently allowed  
5 for use in the production of organic crops as an  
6 insecticide, for plant disease control, and as a  
7 plant or soil amendment.

8 Sulfur is used as a pesticide  
9 repellant for mites, fleas, and ticks for  
10 domestic livestock, chickens, turkeys, ducks,  
11 cattle, swine, sheep, goats, and other animals.  
12 Sulfur its application by rubbing a powder into  
13 the feathers and hair.

14 We had a few written comments; there  
15 was one comment that didn't support its listing.  
16 Another commenter supported the listing with  
17 conditions, with more studies on the necessity of  
18 sulfur.

19 But other commenters generally  
20 supported its listing, including those from  
21 veterinarians and producers. One organization or  
22 one oral commenter cited the transition of open

1 pasture poultry operations required more tools in  
2 their toolbox to allow for open pasture grazing  
3 of poultry.

4 MS. SWAFFAR: Thank you, A-dae. We'll  
5 open the floor; any discussion? Emily?

6 MS. OAKLEY: Could you elaborate on  
7 the public commenter who did not support the  
8 listing of this material, and the one who  
9 supported it with reservations?

10 MS. BRIONES: Yes, one commenter,  
11 beyond pesticides, suggested well questioned its  
12 compatibility with organic practices; questioned  
13 its necessity and questioned the impact on human  
14 and environmental health.

15 The other commenter who supported its  
16 listing pending greater analysis of the substance  
17 necessity, and that was the Cornucopia Institute.

18 MS. SWAFFAR: Emily?

19 MS. OAKLEY: Sorry, one more question,  
20 which is the impact on animals. I've been asking  
21 some of the commenters, and I noticed that that  
22 was missing from the overall review. Given that

1 it's a known skin and eye irritant, that's my  
2 main concern.

3 You're weighing out the animal welfare  
4 issue of not wanting them to have the mites,  
5 ticks, etc., but you also don't want them to be  
6 subjected to skin and eye irritations.

7 So I guess that's my concern right  
8 now; I'm not totally sure how to address that.  
9 I'm not on livestock, so I don't want to throw a  
10 wrench in plans, but it would be great if people  
11 had information on that, if you could share it,  
12 or help me clarify my uncertainty here.

13 MS. SWAFFAR: So I'll take that one.  
14 You know, I just look at the alternatives of what  
15 we're using. Diatomaceous earth is one of the  
16 things that people say is an alternative. I  
17 don't know if you all have ever worked with  
18 diatomaceous earth; it's not a great thing, it  
19 really hurts your lungs. So I kind of weigh  
20 those options.

21 Also, from a worker's standpoint, it's  
22 not a great alternative, either. I've not had

1 much experience with using sulfur firsthand in  
2 chicken houses. How I know that some producers  
3 on the conventional side are using it is more in  
4 a dust box setting.

5 So it's not pure sulfur being applied  
6 to the animal; they'll mix it in with some  
7 shavings or something like that. That way, they  
8 get a little dilution instead of taking sulfur  
9 and rubbing it into the feathers, as the petition  
10 said. That's not really what's happening.

11 I don't have firsthand experience of  
12 knowing of birds getting blinded or anything like  
13 that, but I will say that most producers wouldn't  
14 be applying a product that would blind their  
15 birds. Because then, they would go out of  
16 production, and that's the worst thing you can  
17 have, for a hen not producing an egg.

18 Yes, Sue?

19 MS. BAIRD: Yes; I have seen a few  
20 producers that use the sulfur in their dust  
21 boxes, but I would agree; I've not seen anybody  
22 rub it into the -- first of all, they just don't

1 take that much care of their chickens, unless  
2 they're pet chickens. Then they'll pick each  
3 chicken up and rub it.

4 So it's used in dust boxes; I've not  
5 heard of any who say that there are problems with  
6 eyes as a result of that.

7 I know that they were concerned that  
8 perhaps they would then go to the dust box, the  
9 animals would go outside and affect the soils out  
10 there. I think that would be pretty minimal, if  
11 at all.

12 MS. SWAFFAR: Harriet?

13 MS. BEHAR: Yes, I agree with that.  
14 I would rather not -- we don't have any really  
15 great alternatives.

16 And I think it's also a good idea, when  
17 you're trying to deal with a parasite that could  
18 build resistance one way or another, to have  
19 various things in rotation. I don't know if they  
20 ever get resistance to diatomaceous earth, but it  
21 is a nasty substance to use. So I will vote for  
22 this.

1 MS. SWAFFAR: Steve?

2 MR. ELA: I just want to say that I  
3 echo Emily's thoughts. On the crop side, as a  
4 producer who uses sulfur, it's really nasty when  
5 you get it in your eyes, and it's really easy to  
6 do that.

7 It does kind of puzzle me; I know  
8 chickens are different, but since this is all of  
9 livestock, as I understand, and I may not be  
10 correct on that; but I would think that cattle or  
11 any bigger species -- the evidence doesn't jive  
12 with me.

13 I don't quite understand how you can  
14 dust it and not get it in the eyes, and not have  
15 it be an irritant. There must be something I feel  
16 like I'm missing something.

17 MS. SWAFFAR: So I'll call on myself;  
18 most of the time, sulfur is in a wettable powder  
19 form. There's one particular brand name that  
20 most people use.

21 I do inspect a lot of chickens every  
22 year, not only organic, but on the conventional

1 side too, doing welfare inspections. What I see  
2 of the use of this product; I do see some use of  
3 it. Producers aren't just going in and putting  
4 it in dust boxes as a preventative step. Most of  
5 the time I've never seen it used as a  
6 preventative step; it's only if you have a mite  
7 infestation. That's when they're using this  
8 product.

9 So that's one important note; it's not  
10 like every chicken in America is going to have  
11 sulfur all over it. But I will say, in my  
12 experience with the alternatives; diatomaceous  
13 earth and all that, producers are just not seeing  
14 that work.

15 Diatomaceous earth is great for  
16 internal parasites; external, not so great.  
17 Mites are really hard to get rid of in a poultry  
18 house. I feel it's a really critical tool for  
19 them to have in their toolbox.

20 Emily, did you have comment?

21 MS. OAKLEY: No, we've never really  
22 used sulfur on our farm, but I have handled it.

1 It's also itchy; so I just wanted to throw that  
2 out there as well.

3 I just come at it from the crops  
4 perspective, and knowing that it's not a material  
5 that you want to get on you, if you can avoid it.

6 But I hear the animal welfare issue as  
7 well. We have chiggers in Oklahoma, and they're  
8 awful, so it's a conflict.

9 MS. SWAFFAR: Harriet?

10 MS. BEHAR: So this sulfur is  
11 considered a synthetic because of how it's been  
12 extracted. And it really is, but it's not  
13 available. But sulfur is an element that, in the  
14 past, had been mined. But now, my understanding  
15 is that it comes out of scrubbers from coal-fired  
16 plants and things like that.

17 So the lower cost of that  
18 manufacturing process has made it that we're not  
19 really pulling it out. But if it would have been  
20 a mined product, it would have just been natural  
21 and would have been allowed.

22 MS. SWAFFAR: Sue, comment?

1 MS. BAIRD: Yes, I found it  
2 interesting; the pastured poultry person who  
3 commented yesterday said that they're seeing more  
4 impacts from mites since they've been out on  
5 pasture than when they were in the houses, or  
6 they had outdoor access; but mainly in houses.

7 And now they're putting them out on  
8 pastures, and they're seeing more mites. It  
9 really does impact their health, when they have  
10 mites. They scratch, they lose their feathers; I  
11 think it is a health issue for the animal, that  
12 we find a tool they can use to get rid of the  
13 mites.

14 MS. SWAFFAR: A-dae?

15 MS. BRIONES: And I would note that we  
16 had a commenter, Georgia Sulfur, who did mention  
17 that they had a product that is petroleum jelly  
18 based. And also in the TR, it mentioned that  
19 sulfur can be combined with lard, so it's not  
20 purely in dust form.

21 MS. SWAFFAR: That is true, but most  
22 people I know aren't going to go walking around,

1 spreading that on every chicken. This is a vent  
2 mite, usually, and to Sue's point, this does lead  
3 to picking.

4 It also has a greater welfare impact  
5 for the birds, with the mites. Because I've been  
6 in a few houses with mites, and it's not pretty  
7 at all.

8 Yes, Harriet.

9 MS. BEHAR: But the jello lard could  
10 be used in other species of livestock.

11 MS. SWAFFAR: Yes, that is important  
12 to note. It's not just for poultry; the primary  
13 use is for poultry.

14 Any other discussion? I just want to  
15 reiterate that I do really support this; a lot of  
16 poultry farmers that I see every week are always  
17 asking me for a great option for mites. Most of  
18 the folks I talk to would really like to have  
19 this as a tool in their toolbox.

20 Tom, we're ready to vote.

21 CHAIRMAN CHAPMAN: Okay. So there is  
22 no classification motion here, because this

1 material has been previously classified. The  
2 motion is just on the petition itself, to add  
3 sulfur as petitioned, to 205.603. The motion was  
4 made by A-dae and seconded by Jesse, and the  
5 voting will start with Scott.

6 MR. RICE: Yes.

7 MS. BAIRD: Yes.

8 MS. BEHAR: Yes.

9 MS. OAKLEY: Abstain.

10 DR. THICKE: Yes.

11 MS. BRIONES: Yes.

12 MS. DE LIMA: Yes.

13 MR. BRADMAN: Yes.

14 MS. MOSSO: Yes.

15 MR. ELA: Yes.

16 MR. MORTENSEN: Abstain.

17 MR. BUIE: Yes.

18 MS. SWAFFAR: Yes.

19 DR. SEITZ: Yes.

20 CHAIRMAN CHAPMAN: Chair votes yes.

21 Thirteen yes, zero no, two abstentions; the  
22 motion passes.

1 MS. SWAFFAR: Thank you; moving on to  
2 hypochlorous acid, Dr. Brines.

3 DR. BRINES: Thank you. The petition  
4 for hypochlorous acid was submitted to the  
5 program on July 11th, 2016 by Innovacyn. The  
6 petition requests the addition hypochlorous acid  
7 to Section 205.603 of the national list as a  
8 topical medical treatment.

9 This use is beyond the use that was  
10 previously considered by the board in a previous  
11 petition. In addition to the technical reports  
12 that were already available for this substance,  
13 the subcommittee did request the development of a  
14 limited-scope technical evaluation report to  
15 consider additional uses. That report and the  
16 petition are available to the public on the NOP  
17 website. And this substance was previously  
18 classified by the board in its previous reviews  
19 as a synthetic substance. Thank you.

20 MS. SWAFFAR: Thank you. Francis?

21 DR. THICKE: I forgot I'm in charge of  
22 this one. So this is being petitioned for use

1 for pink eye and as a wound spray, as an  
2 antimicrobial.

3 As was mentioned, it was already on  
4 the list for other uses, as sanitizers. But we  
5 in the Livestock Subcommittee recognizes a  
6 difference in this use, in that this is not being  
7 used as a general sanitizer in this case. It is  
8 being petitioned for a health product, and there  
9 are other options available for producers to use.

10 So this is a topical treatment for  
11 pink eye and wounds. It has different  
12 considerations, because as the technical report  
13 indicates, there are a lot of other options for  
14 pink eye and wound treatment in livestock, and in  
15 the proposal, we've listed about 20-some that can  
16 be used. And so the Livestock Subcommittee was  
17 not real amenable to adding this to the national  
18 list.

19 And public comments were mostly in  
20 favor of not allowing it to be put on the list.  
21 So I think we feel pretty confident that we  
22 should not put it on the list, and I would like

1 to open it up to others' comments.

2 MS. SWAFFAR: Harriet?

3 MS. BEHAR: I do see producers  
4 struggle, sometimes, with pink eye; but I also  
5 see most of them working it out with the current  
6 materials that we have on the national list.

7 A lot of it is also kind of management  
8 related; just not causing the animals to be in  
9 really brushy areas, where they're going to tear  
10 out their eyes, and allow that bacteria to  
11 accumulate.

12 But I do see people having good luck  
13 with the current system.

14 MS. SWAFFAR: Francis?

15 DR. THICKE: Yes, I would agree that  
16 management is very important. Just to kind of  
17 look at how pink eye happens; when animals start  
18 to tear up, they're starting to get infection.  
19 And then you need to do some kind of eye wash to  
20 prevent it from settling into the tissue.

21 And so these products can do that; a  
22 lot of products can serve as an eye wash, as a

1       hypochlorous acid could do, to prevent it from  
2       settling into the tissue.

3                   But once it settles into the tissue,  
4       none of these products are really going to solve  
5       the problem. Then you need an antibiotic or  
6       something else more systemic to really solve the  
7       problem. And then, of course, the animal needs  
8       to be taken out of the herd.

9                   But even for topical treatment, there  
10      are products commercially available. I'm  
11      familiar with one that I use, that is a mixture  
12      of three materials: garlic, aloe, and comfrey.  
13      The garlic serves as an antimicrobial, the aloe  
14      serves as a soothing effect, and the comfrey  
15      serves as a healing stimulant.

16                  So I feel that we really have what we  
17      need for tools for this system.

18                  MS. SWAFFAR: Anyone else? All right,  
19      it looks like we're ready to vote.

20                  CHAIRMAN CHAPMAN: Okay. Again, there  
21      is no motion to classify, since this material has  
22      been previously classified. So it's just votes

1 on the petition. The motion is to add  
2 hypochlorous acid at 205.603; the motion was made  
3 by Francis, seconded by Harriet. A yes vote is  
4 to add, a no vote is to reject this petition.

5 The voting will start with Sue.

6 MS. BAIRD: No.

7 MS. BEHAR: No.

8 MS. OAKLEY: No.

9 DR. THICKE: No.

10 MS. BRIONES: No.

11 MS. DE LIMA: No.

12 MR. BRADMAN: No.

13 MS. MOSSO: No.

14 MR. ELA: No.

15 MR. MORTENSEN: No.

16 MR. BUIE: No.

17 MS. SWAFFAR: No.

18 DR. SEITZ: No.

19 MR. RICE: No.

20 CHAIRMAN CHAPMAN: Chair votes no.

21 Zero yes, 15 no; the motion fails.

22 MS. SWAFFAR: Thank you, Francis.

1 That is your last material of your tenure. It  
2 makes me sad.

3 All right. Moving on for a clarifying  
4 emergency for use of synthetic parasiticide in  
5 organic livestock production. No introduction by  
6 Dr. Brines, so we'll go to Harriet.

7 MS. BEHAR: Okay. This was put in  
8 place due to the vote by the Livestock  
9 Subcommittee close to two years ago, to lower the  
10 withdrawal time for moxidectin and fenbendazole,  
11 which was precipitated by the removal of  
12 ivermectin.

13 So the thought was, We have one less  
14 parasiticide and then the other two would have  
15 more availability, by having a lowered withdrawal  
16 time. But it was tied to the phrase, for  
17 emergency treatment.

18 So there was a thought that, in order  
19 to have consistency in the certification system,  
20 to make it transparent for producers, certifiers,  
21 inspectors, and consumers, of when these  
22 parasiticides were being used, that we should

1 define what an emergency is when relating to  
2 parasiticides.

3 At first, we discussed defining  
4 emergency in a broader sense. But since the  
5 word, emergency, is used numerous times in the  
6 regulation in crop production and other places,  
7 we thought we would stick to keeping it in the  
8 livestock section and just define what an  
9 emergency looks like, and when synthetic  
10 parasiticides were going to be used.

11 So we looked at following the  
12 hierarchy for using synthetics in both the  
13 processing and the crops sections of the rule;  
14 first, you should be looking at management,  
15 cultural, biological, mechanical ways of  
16 preventing the problem. After that, move towards  
17 the use of natural materials, having the  
18 synthetic being the last resort.

19 And that was somewhat of a roadmap to  
20 help operators understand that, again, just  
21 because a synthetic is on the national list -- in  
22 this case, a synthetic parasiticide -- that's not

1 the first place you go when you have a problem.  
2 Really, you should be looking to prevent the  
3 problem to start with, and work through that  
4 hierarchical chain to the synthetic.

5 We did get a lot of comments, which is  
6 always wonderful to read, and so I thank everyone  
7 for that. It looks like we probably should send  
8 this back to subcommittee to take into account  
9 all of those great comments.

10 I really appreciated the comments from  
11 the numerous certifiers, NOC, Straus, MOSA, CCOF,  
12 PCO, OEFFA, and others who commented on how this  
13 would be implemented.

14 They are the ones who have to read the  
15 language and explain it to their producers. So  
16 we definitely don't want there to be confusion  
17 out there. The whole point was to have clarity.

18 So that's it. There is a lot of  
19 verbage, that was one thing. We did discuss this  
20 with the program, and they gave input as well on  
21 where to put it and how to write it and things  
22 like that. So once we do get the wording right,

1 we could put this forward for rulemaking.

2 MS. SWAFFAR: So I'll open it up for  
3 discussion. Dave?

4 MR. MORTENSEN: Yes, this strategy  
5 sounds great; we're all for clarity.

6 MS. SWAFFAR: Emily?

7 MS. OAKLEY: It's a good example of  
8 collaboration between the NOSB and the NOP,  
9 because you certainly don't want to write  
10 something that can't past the muster of the NOP.

11 MS. SWAFFAR: So I just want to talk a  
12 little bit about this. I know there's been a lot  
13 of suggestion that maybe this would be better as  
14 guidance, and a lot of folks in the audience know  
15 my feel of guidance.

16 You probably won't get anything out of  
17 livestock, as guidance for a while, because I  
18 think there's a lot of room for interpretation in  
19 guidance, and that's what we're trying to solve  
20 here, is trying to define that.

21 But I really appreciated the public  
22 comment on ways for us to actually improve this

1 document. I think we'll come back with something  
2 even stronger, hopefully in the spring.

3 So does anyone -- Harriet?

4 MS. BEHAR: There were numerous  
5 comments on addressing this issue somewhat  
6 differently, not having the hierarchy in there,  
7 and instead having a specific definition for  
8 emergency treatment when using synthetic  
9 parasiticides, putting it instead in the  
10 definition section; and so we'll look at that.

11 MS. SWAFFAR: Any other comments?  
12 Harriet?

13 MS. BEHAR: I make the motion to send  
14 it back to subcommittee.

15 MS. SWAFFAR: Do we have a second?

16 MR. MORTENSEN: I second.

17 CHAIRMAN CHAPMAN: Okay. There's a  
18 motion to refer the proposal on clarifying  
19 emergency for use in synthetic parasiticides in  
20 organic livestock production back to the  
21 Livestock Subcommittee. The motion was made by  
22 Harriet, seconded by Dave. A yes vote is to

1 refer back to subcommittee; a no vote is to  
2 continue discussion of this item. The voting  
3 will start with Harriet.

4 MS. SWAFFAR: Point of order; we  
5 should open the floor.

6 CHAIRMAN CHAPMAN: Is there any  
7 discussion on this motion? Seeing none, we will  
8 proceed to a vote. The voting will start with  
9 Harriet.

10 MS. BEHAR: Yes.

11 MS. OAKLEY: Yes.

12 DR. THICKE: Yes.

13 MS. BRIONES: Yes.

14 MS. DE LIMA: Yes.

15 MR. BRADMAN: Yes.

16 MS. MOSSO: Yes.

17 MR. ELA: Yes.

18 MR. MORTENSEN: Yes.

19 MR. BUIE: Yes.

20 MS. SWAFFAR: Yes.

21 DR. SEITZ: Yes.

22 MR. RICE: Yes.

1 MS. BAIRD: Yes.

2 CHAIRMAN CHAPMAN: Chair votes yes.

3 Fifteen yes, zero no; the motion passes, and it's  
4 referred back to subcommittee.

5 MS. SWAFFAR: And that concludes  
6 Livestock. Once again, we get you back closer to  
7 on time.

8 CHAIRMAN CHAPMAN: Thank you, Ashley.  
9 We're only about an hour behind right now, not  
10 bad. Up next is Handling; Lisa? Lisa De Lima,  
11 Chair of Handling.

12 MS. DE LIMA: All right, we're going  
13 to jump right into sunset, starting with  
14 attapulgate. Dr. Brines?

15 DR. BRINES: Thank you. We begin the  
16 Handling Subcommittee sunset review under Section  
17 205.605: non-agricultural, non-organic  
18 substances allowed as ingredients allowed in or  
19 on processed products labeled as organic or made  
20 with organic specified ingredients or food  
21 groups.

22 The first listing is attapulgate as a

1 processing aid in the handling of plant and  
2 animal oils. The most recent technical review  
3 was completed in 2010. Thanks.

4 MS. DE LIMA: Joelle?

5 MS. MOSSO: Attapulgite is a natural  
6 clay with adsorptive properties, with an open  
7 channel that can filter and absorb and adsorb  
8 substances to remove powders and other  
9 impurities.

10 During the spring comment, we received  
11 three votes to maintain and two to question  
12 removal due to lack of support info we received  
13 to public comments.

14 Otherwise, it's a pretty non-contentious  
15 material.

16 Within subcommittee, we had zero yes  
17 votes to remove, seven to maintain, and one  
18 absent.

19 MS. DE LIMA: Is there any discussion?

20 CHAIRMAN CHAPMAN: Okay, we have a  
21 motion to remove attapulgite from 205.605(a).  
22 The motion was made by Joelle and seconded by

1 Ashley. This is a motion to remove, so a yes  
2 vote is to remove, no is to retain; the voting  
3 will start with Emily.

4 MS. OAKLEY: No.

5 DR. THICKE: No.

6 MS. BRIONES: No.

7 MS. DE LIMA: No.

8 MR. BRADMAN: No.

9 MS. MOSSO: No.

10 MR. ELA: No.

11 MR. MORTENSEN: No.

12 MR. BUIE: No.

13 MS. SWAFFAR: No.

14 DR. SEITZ: No.

15 MR. RICE: No.

16 MS. BAIRD: No.

17 MS. BEHAR: No.

18 CHAIRMAN CHAPMAN: Chair votes no.

19 Zero yes, 15 no; the motion fails.

20 MS. DE LIMA: Next up, diatomaceous  
21 earth; Dr. Brines.

22 DR. BRINES: Thank you; we're

1 continuing on under 205.605, non-synthetics  
2 allowed, and the listing is bentonite. Thank  
3 you.

4 MS. DE LIMA: Joelle?

5 MS. MOSSO: The second of the clays;  
6 it's a natural clay that is also used for  
7 filtering. It's used widely in the wine and oil  
8 industries to remove proteins and impurities.

9 It is manufactured by open mining,  
10 which is what we received two comments for  
11 further review on. However, nothing has changed  
12 since prior listing.

13 It was reviewed in 2015 with no  
14 opposition to relist, and in the fall, we  
15 received four comments to relist. It was noted  
16 to be extremely critical to the wine and oil  
17 industries.

18 In committee, we had zero to remove  
19 and seven to maintain listing, with one absent.

20 MS. DE LIMA: Any discussion?

21 Harriet.

22 MS. BEHAR: I like fermented

1 beverages.

2 MS. DE LIMA: All right. No other  
3 discussion?

4 CHAIRMAN CHAPMAN: All right, this is  
5 a motion to remove bentonite from 205.605(a).  
6 The motion was made by Joelle and seconded by  
7 Ashley. A yes vote is to remove, a no vote is to  
8 retain, and the voting will start with Francis.

9 DR. THICKE: No.

10 MS. BRIONES: No.

11 MS. DE LIMA: No.

12 MR. BRADMAN: No.

13 MS. MOSSO: No.

14 MR. ELA: No.

15 MR. MORTENSEN: No.

16 MR. BUIE: No.

17 MS. SWAFFAR: No.

18 DR. SEITZ: No.

19 MR. RICE: No.

20 MS. BAIRD: No.

21 MS. BEHAR: No.

22 MS. OAKLEY: No.

1                   CHAIRMAN CHAPMAN: Chair votes no.  
2                   Zero yes, 15 no; the motion fails.

3                   MS. DE LIMA: All right, next up is  
4                   nitrogen; that's me, and my whole computer just  
5                   froze, so give me a second to catch up. Dr.  
6                   Brines?

7                   DR. BRINES: Okay, I'll read slowly,  
8                   then. So we're continuing on under 205.603(a),  
9                   non-synthetics allowed, and the listing is  
10                  diatomaceous earth: food-filtering aid only.  
11                  The most recent technical advisory panel report  
12                  is dated 1995. Thank you.

13                  MS. DE LIMA: Joelle?

14                  MS. MOSSO: Okay, so we move from  
15                  clays to crushed shells of silica. They are also  
16                  filter aids for syrups, juices, beers, and other  
17                  beverages, as well as other products within the  
18                  industry.

19                  It is not present in the finished  
20                  product, and is classified as a processing aid.  
21                  It is also produced through mining. In spring we  
22                  received a lot of public comment to relist, as it

1 is considered critical; and in fall, we received  
2 five public comments to relist as well.

3 In committee, we had zero to remove,  
4 seven to retain on the list, and one absent.

5 MS. DE LIMA: Any discussion from the  
6 board? Seeing none, we'll move to a vote.

7 CHAIRMAN CHAPMAN: This is a motion to  
8 remove diatomaceous earth from 205.605(a). The  
9 motion was made by Joelle and seconded by Ashley.  
10 It's a motion to remove, so a yes vote is to  
11 remove, a no vote is to retain. The voting will  
12 begin with A-dae.

13 MS. BRIONES: No.

14 MS. DE LIMA: No.

15 MR. BRADMAN: No.

16 MS. MOSSO: No.

17 MR. ELA: No.

18 MR. MORTENSEN: No.

19 MR. BUIE: No.

20 MS. SWAFFAR: No.

21 DR. SEITZ: No.

22 MR. ELA: No.

1 MS. BAIRD: No.

2 MS. BEHAR: No.

3 MS. OAKLEY: No.

4 DR. THICKE: No.

5 CHAIRMAN CHAPMAN: Chair votes no.

6 Zero yes, 15 no; the motion fails.

7 MS. DE LIMA: All right. Next up is  
8 nitrogen. Nitrogen is used to --

9 CHAIRMAN CHAPMAN: Dr. Brines.

10 MS. DE LIMA: Oh, sorry.

11 DR. BRINES: Sorry to jump in there.

12 Very quickly, we're still under the non-  
13 synthetics allowed, and this listing is nitrogen,  
14 oil-free grades with a technical advisory panel  
15 dated 1995. Thanks.

16 MS. DE LIMA: All right. So,  
17 nitrogen, used in storage and packaging, used in  
18 flash-freezing of foods. This was another  
19 material that we reviewed two years ago and  
20 passed, and that we're looking at again.

21 In the early review, all comments were  
22 in favor of it remaining on the national list.

1 Any discussion? Seeing none, we'll move to a  
2 vote. Tom?

3 CHAIRMAN CHAPMAN: This is a motion to  
4 remove nitrogen from 205.605(a). The motion is  
5 made by Lisa, seconded by Ashley. It's a motion  
6 to remove so a yes vote is to remove, a no vote  
7 is to retain, and the voting will start with  
8 Lisa.

9 MS. DE LIMA: No.

10 MR. BRADMAN: No.

11 MS. MOSSO: No.

12 MR. ELA: No.

13 MR. MORTENSEN: No.

14 MR. BUIE: No.

15 MS. SWAFFAR: No.

16 DR. SEITZ: No.

17 MR. RICE: No.

18 MS. BAIRD: No.

19 MS. BEHAR: No.

20 MS. OAKLEY: No.

21 DR. THICKE: No.

22 MS. BRIONES: No.

1                   CHAIRMAN CHAPMAN: Chair votes no.  
2                   Zero yes, 15 no; the motion fails.

3                   MS. DE LIMA: Next up is sodium  
4                   carbonate. Dr. Brines?

5                   DR. BRINES: Thank you. This is the  
6                   final substance under Section 205.605(a), a non-  
7                   synthetics allowed, and the listing is sodium  
8                   carbonate. The last technical report is dated  
9                   1995. Thanks.

10                  MS. DE LIMA: So this is another  
11                  material we're reviewing early. Sodium carbonate  
12                  is used as a leavening agent. It can also be  
13                  used as an anti-caking agent and an acidity  
14                  regulator and stabilizer, no ancillary  
15                  substances.

16                  And in the public comment from the  
17                  spring, this round of public comment stated that  
18                  it is essential for use in things like soy-based  
19                  extraction, frozen desserts, and baked goods.  
20                  And also interesting, used as a pH adjuster in  
21                  organic laundry detergents.

22                  Any questions from the board? Seeing

1 none, we'll move to a vote.

2 CHAIRMAN CHAPMAN: This is a motion to  
3 remove sodium carbonate from 205.605(a). The  
4 motion was made by Lisa, seconded by Ashley.  
5 It's a motion to remove, so a yes vote is to  
6 remove, a no vote is to retain. We'll start the  
7 voting with Asa.

8 MR. BRADMAN: I want to keep it, so,  
9 no.

10 MS. MOSSO: No.

11 MR. ELA: No.

12 MR. MORTENSEN: No.

13 MR. BUIE: No.

14 MS. SWAFFAR: No.

15 DR. SEITZ: No.

16 MR. RICE: No.

17 MS. BAIRD: No.

18 MS. BEHAR: No.

19 MS. OAKLEY: No.

20 DR. THICKE: No.

21 MS. BRIONES: No.

22 MS. DE LIMA: No.

1                   CHAIRMAN CHAPMAN: Chair votes no.  
2                   Zero yes, 15 no; the motion fails.

3                   MS. DE LIMA: All right. Next up is  
4                   acidified sodium chlorite. Dr. Brines?

5                   DR. BRINES: Thank you; we're now  
6                   moving to paragraph (b) of Section 205.605.  
7                   Paragraph (b) is synthetics allowed, and the  
8                   listing is acidified sodium chlorite: secondary  
9                   direct antimicrobial food treatment and indirect  
10                  food contact surface sanitizing, acidified with  
11                  citric acid only.

12                  The original technical report was  
13                  completed in 2008, and a more recent technical  
14                  report for livestock uses was also completed in  
15                  2013. Thanks.

16                  MS. DE LIMA: Ashley?

17                  MS. SWAFFAR: Acidified sodium  
18                  chlorite is one we're doing early again. It's  
19                  used as a processing aid in wash and rinse water,  
20                  and for disinfecting food processing equipment,  
21                  utensils, and other things.

22                  Some of the public comment that we got

1 was that it's used to control food-borne  
2 pathogens, to protect consumer health, and comply  
3 with FSMA.

4 And then we got another comment again,  
5 saying that we should do the comprehensive review  
6 of sanitizers, which the materials committee is  
7 hoping to do.

8 You know, it's another tool in the  
9 toolbox for folks who are compliant with the FSMA  
10 in sanitation.

11 MS. DE LIMA: Any discussion?

12 MR. BRADMAN: I'll make a longer  
13 statement when we talk about chlorine materials,  
14 but I just wanted to reiterate, I do think we  
15 need some more review on chlorine materials.  
16 I'll touch on that again; thanks.

17 MS. DE LIMA: All right, we'll move to  
18 a vote.

19 CHAIRMAN CHAPMAN: Can you scroll down?  
20 Michelle can you scroll down? So this is a motion  
21 to remove acidified sodium chlorite from  
22 205.605(b). The motion was made by Ashley,

1 seconded by Lisa. It's a motion to remove, so a  
2 yes vote is to remove, and a no vote is to  
3 retain, and the voting will start with Joelle.

4 MS. MOSSO: No.

5 MR. ELA: No.

6 MR. MORTENSEN: No.

7 MR. BUIE: No.

8 MS. SWAFFAR: No.

9 DR. SEITZ: No.

10 MR. ELA: No.

11 MS. BAIRD: No.

12 MS. BEHAR: No.

13 MS. OAKLEY: No.

14 DR. THICKE: No.

15 MS. BRIONES: No.

16 MS. DE LIMA: No.

17 MR. BRADMAN: No.

18 CHAIRMAN CHAPMAN: Chair votes no.

19 Zero yes, 15 no; the motion fails.

20 MS. DE LIMA: Next up, carbon dioxide.

21 Dr. Brines?

22 DR. BRINES: Thank you; we're still

1 under paragraph (b), synthetics allowed, and the  
2 listing is carbon dioxide. The most recent  
3 technical report for this substance was completed  
4 in 2006. Thank you.

5 MS. DE LIMA: Carbon dioxide is used  
6 in MAP packaging and storage, freezing of foods,  
7 beverage carbonation, as an extracting agent,  
8 processing aid, and pest control in grain and  
9 produce storage.

10 All public comment received was in  
11 favor of retaining on the national list, and this  
12 was just reviewed in 2015 by the board and voted  
13 unanimously.

14 Any discussion? Seeing none, we'll  
15 move to vote.

16 CHAIRMAN CHAPMAN: It's a motion to  
17 remove carbon dioxide from 205.605(b). The  
18 motion is by Lisa, seconded by Ashley. A yes  
19 vote is to remove, a no vote is to retain, and  
20 the voting will start with Steve.

21 MR. ELA: No.

22 MR. MORTENSEN: No.

1 MR. BUIE: No.

2 MS. SWAFFAR: No.

3 DR. SEITZ: No.

4 MR. RICE: No.

5 MS. BAIRD: No.

6 MS. BEHAR: No.

7 MS. OAKLEY: No.

8 DR. THICKE: No.

9 MS. BRIONES: No.

10 MS. DE LIMA: No.

11 MR. BRADMAN: No.

12 MS. MOSSO: No.

13 CHAIRMAN CHAPMAN: Chair votes no.

14 Zero yes, 15 no; the motion fails.

15 MS. DE LIMA: Next up is chlorine

16 materials. Dr. Brines?

17 DR. BRINES: Thank you; continuing on,

18 paragraph (b), synthetics allowed. The listing

19 is chlorine materials: disinfecting and

20 sanitizing food contact surfaces, except that

21 residual chlorine levels in the water shall not

22 exceed the maximum residual disinfectant limit

1 under the Safe Drinking Water Act. In  
2 parentheses, the materials are calcium  
3 hypochlorite, chlorine dioxide, and sodium  
4 hypochlorite.

5 The most recent technical report for  
6 these materials was completed in 2006. Thanks.

7 MS. DE LIMA: Ashley?

8 MS. SWAFFAR: So chlorine materials  
9 are used to disinfect and sanitize food contact  
10 surfaces. Some of the public comment that we  
11 received is that chlorine materials are the best  
12 option for mitigating fungi and molds.

13 These materials are strategically used  
14 to ensure food safety. Another one said that  
15 organic handlers have the same responsibility  
16 with regard to food safety as conventional  
17 handlers, only organic handlers have far fewer  
18 options when it comes to the materials available  
19 to protect food from contamination.

20 And then we received several comments  
21 over -- we just reviewed this one too, saying  
22 that these are essential materials for their

1 operations for food safety.

2 And we did get the comment again,  
3 asking for a comprehensive review of sanitizers.

4 MS. DE LIMA: Any discussion? Asa?

5 MR. BRADMAN: I just want to make a  
6 few comments on these. These are pesticides;  
7 they are synthetic pesticides. They are  
8 essential, as we hear, for food safety. In that  
9 sense, they are important for public health.

10 But I think they represent kind of the  
11 trade-offs we have with organic and other  
12 settings, when we use toxic materials for public  
13 health. It's the same reason we still use DDT  
14 for malaria control, the reason why they're  
15 spraying organophosphates in Florida for Zika.

16 It's really the same application here,  
17 but I think we all understand that they're  
18 essential. But there are risks associated with  
19 these. Bleach itself is considered an asthmagen  
20 by the Association of Occupational and  
21 Environmental Clinics.

22 Chloroform in the air is associated

1 with these chlorine materials. Chloroform is a  
2 known carcinogen and a known reproductive  
3 toxicant.

4 So we're intentionally using materials  
5 in this sector that we know have pretty serious  
6 health impacts.

7 There's not much data in the food  
8 processing sector, but in California the  
9 occupation with the highest occupationally-  
10 acquired asthma is in janitorial services, which  
11 involve cleaning products, a lot of bleach and  
12 disinfectant use.

13 As probably many of you know, the EPA  
14 has been going through process to review  
15 sanitizers' use in hospitals. I do a lot of work  
16 in child care settings; a lot child care  
17 facilities are actually moving away from bleach.

18 So I think there's a really important  
19 and essential use for sanitizers, but I think  
20 this is a really important issue. It's a case  
21 where we're using serious pesticides that have  
22 bad impacts; lifelong respiratory disease,

1 potentially, and other health impacts.

2 I think there really is a need for a  
3 comprehensive review, and through the life of  
4 organic, which will hopefully be until the end of  
5 time, we need to continually review and improve  
6 and understand what the implications are of these  
7 materials.

8 MS. DE LIMA: Emily?

9 MS. OAKLEY: Thank you so much for  
10 that, Asa. That was articulate, well declared,  
11 and I hope that that will make the case crystal  
12 clear for why we need to add this to our work  
13 agenda.

14 MS. DE LIMA: Joelle?

15 MS. MOSSO: Definitely agree with  
16 everything Asa just said. I just would like to  
17 emphasize right now, it is the best tool from a  
18 food safety perspective, and it is essential, as  
19 Asa did note.

20 That being said, I think in addition  
21 to the comprehensive review that we do with  
22 sanitizers, just to emphasize the need, when new

1 petitions for sanitizers come on, to be diligent  
2 and really look at them as, could they be  
3 applicable, and what other impacts they may have.

4 Chlorine is definitely a human health  
5 irritant. It's also an environmental concern,  
6 with waste water discharge, etc. But it is  
7 certainly essential and critical at this point,  
8 in order to ensure a safe food supply. One of  
9 the reasons why the U.S. food system is as safe  
10 as it is in comparison to other areas of the  
11 world, where people to worry about dying the day  
12 after they eat.

13 So I think we need to keep  
14 perspective, but certainly an emphasis to find a  
15 better solution other than chlorine.

16 MS. DE LIMA: Francis, and then  
17 Harriet.

18 DR. THICKE: Yes, thank you, Asa and  
19 Joelle; you articulated it very well, and that's  
20 the reason why we do need this comprehensive  
21 review. I suggest that both Asa and Joelle are  
22 part of that review process.

1           MR. BRADMAN: I accept. I don't know  
2 where the time is going to come from, but I think  
3 it's an important issue.

4           MS. BEHAR: I already asked you both,  
5 but I wanted to also make sure that on that  
6 comprehensive review, on the work agenda, that  
7 we're also looking at naturals as well as  
8 synthetics; so things that are not necessarily  
9 already on the national list, because we're  
10 allowed to use natural items like vinegar and  
11 essential oils; I don't even know what's out  
12 there.

13                       But there could be, in certain  
14 situations -- I'm not necessarily saying in a  
15 meat-slaughtering plant where you really do need  
16 to have high rates of pathogen kill -- but there  
17 could be other places where more natural  
18 materials would be maybe even preferred.

19           MR. BRADMAN: I think what you're  
20 getting at is the issue we deal a lot with in  
21 child care. There are obstacles around where you  
22 need to clean, where you need to sanitize, and

1 where you need to disinfect.

2 And it's important not to use your  
3 most harsh materials where you just need to  
4 clean, but also follow the rules to where you  
5 need to sanitize or yet another level, disinfect.

6 And then of course, for the materials  
7 you use for sanitizing and disinfection, they  
8 usually need some other level of approval like  
9 EPA. And often some natural materials don't make  
10 that bar, although in some cases, they may  
11 actually meet those criteria, but they haven't  
12 been reviewed and approved.

13 MS. DE LIMA: Dave and then Ashley.

14 MR. MORTENSEN: I also want to thank  
15 you both; that was really helpful and insightful.  
16 If it was the case that we see increased indoor  
17 production of plants, I've seen a lot of bleach  
18 used in that environment, to sterilize the  
19 restart of the hydroponic system and such.

20 So I think we'll want to be continuing  
21 to think of systems level, and I thank you for  
22 that rigorous and thoughtful discussion of the

1 topic.

2 MS. DE LIMA: Ashley?

3 MS. SWAFFAR: Yes, I just want to say  
4 why I think the comprehensive review of  
5 sanitizers is important, because we hear this  
6 every time we look at sanitizers.

7 I just want to stress how critically  
8 important chlorine is to stay on the national  
9 list now. You know, I also look at this from a  
10 small-scale handler perspective. Chlorine  
11 materials are readily available; there may be  
12 other alternatives, but they might be a crazy  
13 system that you have to install.

14 So I hope you guys look at that when  
15 you are doing your review, and consider not  
16 everyone is a huge manufacturing facility. There  
17 are a lot of small scale, on-farm handling  
18 facilities.

19 MS. DE LIMA: Joelle?

20 MS. MOSSO: I'll be brief; just to  
21 speak to that, there are definitely some natural  
22 alternatives, but they do not have the efficiency

1 that chlorine does. And unfortunately, in most  
2 applications would not be appropriate to be used.

3 I think I can speak pretty confidently  
4 for people who do use a significant amount of  
5 chlorine; it's definitely not their choice to do  
6 so. But certainly from a food safety  
7 perspective, having read and monitored that for a  
8 long time now, nothing so far is anything near  
9 equivalent to chlorine.

10 So yes, just to emphasize its critical  
11 nature from compliance as well as just safety.

12 MS. DE LIMA: Steve, and then Harriet.

13 MR. ELA: And we are one of those  
14 small-scale handlers. I would echo that it's a  
15 challenge, and with FSMA now, where we're looking  
16 at packing lines that have to have zero  
17 contamination, and yet we're dealing with a crop  
18 that is inherently outside; it's almost an  
19 insurmountable challenge anyhow. And so I think  
20 any tool that small processors can have to make  
21 it easier is going to be critical.

22 And I echo -- I personally dislike

1 chlorine. It bothers me, yet I don't know any  
2 way around it at this point.

3 MS. BEHAR: Comprehensive will include  
4 practical.

5 MS. DE LIMA: All right. It looks  
6 like we're ready for a vote.

7 CHAIRMAN CHAPMAN: Okay, this is a  
8 motion to remove chlorine materials from  
9 205.605(b). All three chlorine materials here  
10 are grouped together under the single motion.  
11 The motion was made by Ashley and seconded by  
12 Joelle. It's a motion to remove, so a yes vote  
13 is to remove, a no vote is to retain, and the  
14 voting will start with Dave.

15 MR. MORTENSEN: No.

16 MR. BUIE: No.

17 MS. SWAFFAR: No.

18 DR. SEITZ: No.

19 MR. RICE: No.

20 MS. BAIRD: No.

21 MS. BEHAR: No.

22 MS. OAKLEY: No.

1 DR. THICKE: No.

2 MS. BRIONES: No.

3 MS. DE LIMA: No.

4 MR. BRADMAN: No.

5 MS. MOSSO: No.

6 MR. ELA: No.

7 CHAIRMAN CHAPMAN: Chair votes no.

8 Zero yes, 15 no; the motion fails.

9 MS. DE LIMA: Next up, magnesium  
10 chloride. Dr. Brines?

11 DR. LEWIS: Lisa, could I make one  
12 remark? Just in terms of the conversation, I  
13 found this very helpful, talking about chlorine  
14 materials related to work agenda item, especially  
15 in terms of what you mentioned about  
16 understanding the use profile.

17 The EPA may provide some insight with  
18 that, in how we can look at this activity in  
19 creating efficiencies in customer service.

20 So I'm looking forward in terms of, as  
21 we talk about this in the department, some  
22 information you provide us now would help us

1 frame this topic more clearly, so thank you for  
2 that.

3 MS. DE LIMA: Dr. Brines?

4 DR. BRINES: All right, thank you.

5 Next up, also under 205.605(b), synthetics  
6 allowed; the listing is magnesium chloride,  
7 derived from sea water. And the most recent  
8 technical report was completed in 2016. Thank  
9 you.

10 MS. DE LIMA: So magnesium chloride;  
11 it's used as a coagulant in tofu production.  
12 It's also used in certified organic dietary  
13 supplements, vitamins, and in supplement  
14 beverages.

15 All the public comment that we  
16 received was in favor of retaining it on the  
17 national list. There has been public comment  
18 requesting that it be moved from 205.605(b) to  
19 205.605(a), and that is on our work plan. We're  
20 bringing that forward in the spring.

21 And this was another material that was  
22 reviewed by the NOSB in 2015, and was voted

1 unanimously to stay on the national list.

2 Any discussion? Harriet?

3 MS. BEHAR: I like tofu.

4 MS. DE LIMA: All right. Seeing no  
5 other discussion, we'll move to a vote.

6 CHAIRMAN CHAPMAN: It's good to get  
7 that on the record, because that hasn't been  
8 shared by everyone on the NOSB in the past, but  
9 it's good to know.

10 This is a motion to remove magnesium  
11 chloride from the 205.605(b). The motion was  
12 made by Lisa and seconded by Ashley. It's a  
13 motion to remove, so a yes vote is to remove, a  
14 no vote is to retain, and the voting will start  
15 with Jesse.

16 MR. BUIE: No.

17 MS. SWAFFAR: No.

18 DR. SEITZ: No.

19 MR. RICE: No.

20 MS. BAIRD: No.

21 MS. BEHAR: No.

22 MS. OAKLEY: No.

1 DR. THICKE: No.

2 MS. BRIONES: No.

3 MS. DE LIMA: No.

4 MR. BRADMAN: No.

5 MS. MOSSO: No.

6 MR. ELA: No.

7 MR. MORTENSEN: No.

8 CHAIRMAN CHAPMAN: Chair votes no.

9 Zero yes, 15 no; the motion fails.

10 MS. DE LIMA: Next up, potassium acid  
11 tartrate. Dr. Brines?

12 DR. BRINES: Thank you. We're  
13 continuing on under the synthetics allowed at  
14 205.605(b). The listing is potassium acid  
15 tartrate, and the technical report was last  
16 updated in 2017. Thank you.

17 MS. DE LIMA: Steve?

18 MR. ELA: Potassium acid tartrate is a  
19 byproduct of winemaking. It's commonly known as  
20 cream of tartare, used in baking. It lit the  
21 public comment message board with, I think two  
22 comments, all in favor of relisting, so it's

1       pretty straightforward.

2                   And I should note, at the spring  
3 meeting, a lot of the public comments were that  
4 it was mis-listed, and we had a proposal later on  
5 to reclassify it.

6                   MS. DE LIMA: Any discussion? Seeing  
7 none, we'll move to a vote.

8                   CHAIRMAN CHAPMAN: The motion to  
9 remove potassium acid tartrate from 205.605(b);  
10 the motion was by Steve, seconded by Ashley. A  
11 yes vote is to remove, a no vote is to retain,  
12 and the voting will start with Ashley.

13                   MS. SWAFFAR: No.

14                   DR. SEITZ: No.

15                   MR. RICE: No.

16                   MS. BAIRD: No.

17                   MS. BEHAR: No.

18                   MS. OAKLEY: No.

19                   DR. THICKE: No.

20                   MS. BRIONES: No.

21                   MS. DE LIMA: No.

22                   MR. BRADMAN: No.

1 MS. MOSSO: No.

2 MR. ELA: No.

3 MR. MORTENSEN: No.

4 MR. BUIE: No.

5 CHAIRMAN CHAPMAN: Chair votes no.

6 Zero yes, 15 votes no; the motion fails.

7 MS. DE LIMA: Next we have sodium  
8 phosphates. Dr. Brines?

9 DR. BRINES: Thank you. This is the  
10 last substance under 205.605(b), synthetics  
11 allowed, and the listing is sodium phosphates,  
12 for use only in dairy foods. The technical  
13 report was completed most recently in 2016.  
14 Thank you.

15 MS. DE LIMA: All right. So sodium  
16 phosphates; it can have a variety of uses, but  
17 it's currently annotated to dairy use only.

18 The material is derived from  
19 phosphoric acid; it's used to prevent the  
20 separation of water and fat in cheese, so  
21 basically, it's an emulsifier in non-fat cheese  
22 and milk.

1           The vote coming out of subcommittee  
2           was unanimous to retain on the national list, but  
3           there was a split in public comment.

4           Manufacturers in public comment said that it was  
5           essential as an emulsifier in cheese production,  
6           also in making high protein smoothies, and  
7           stabilizing the product.

8           We also had a lot of public comment  
9           concern about human health impacts, questioning  
10          its essentiality.

11          I should say we reviewed this as  
12          another one of those items that was reviewed in  
13          2015, and we did have a technical report done.  
14          Basically, as far as the human health concerns,  
15          it was not very conclusive, and wasn't able to  
16          single out a phosphate food additive or  
17          ingredient and isolate that as one risk factor.

18          Tom, do you have anything to add? Tom  
19          and I were both the leads on this material.

20                 CHAIRMAN CHAPMAN: No, I think you  
21                 summarized it very well.

22                 MS. DE LIMA: Okay, questions from the

1 board? Harriet?

2 MS. BEHAR: Was the subcommittee fully  
3 satisfied that the alternatives were not  
4 acceptable? Were there certain areas where only  
5 the sodium phosphate could be used, but not  
6 sodium citrate, for instance, or others?

7 I know I did ask that question of a  
8 commenter, but I'm wondering if that discussion  
9 was inside the subcommittee, and how you felt  
10 about that.

11 CHAIRMAN CHAPMAN: I don't want to  
12 speak for all subcommittee members, but if anyone  
13 wants to speak up on the subcommittee?

14 MS. MOSSO: And in regards to the  
15 question, yes, that conversation was had,  
16 certainly, and I think it was highlighted in the  
17 public comments as well, where you saw the actual  
18 buffer capacity of sodium phosphates in  
19 comparison to the alternative. The closest  
20 alternative would be sodium citrate.

21 And so there's a chemical-functional  
22 property that is there for sodium phosphates,

1 that allow it to interact, to provide the  
2 properties that are needed in that product.

3 And I personally spoke to people who  
4 used it and asked about their challenges on that  
5 system, to see if they could find alternatives.  
6 They certainly had investigated it, and looked;  
7 but in actuality, they ended up having to use  
8 more sodium citrate when trying to use it. So it  
9 was not as effective, and you have to closely  
10 control how you do that, and it's almost  
11 impossible to do in a commercial setting.

12 So irrespective of the chemical  
13 properties, which is the buffer capacity, the  
14 other alternatives are not sufficient to satisfy  
15 the same kind of effect in the food product.

16 MS. DE LIMA: Francis?

17 DR. THICKE: Maybe I'm being a purist  
18 here, but when I saw that it's used in cream to  
19 get better mouthfeel, I was a little concerned.  
20 We make cream in our on-farm processing plant,  
21 and my customers would not like to see something  
22 in their cream.

1                   We also make cheese; not processed  
2 cheese, but of course, we don't use it. So I'm  
3 not going to vote for this product.

4                   MS. DE LIMA: Emily?

5                   MS. OAKLEY: I think that, in a case  
6 like this, although it would take a large  
7 quantity of sodium phosphate to potentially cause  
8 concern, I also think we should take the  
9 precautionary principle.

10                   I think that consumers think they  
11 might want a product, but they may not know,  
12 necessarily, what's in it, and they're trusting  
13 us to make decisions on the applicability or  
14 necessity of a material.

15                   I know that this material is used  
16 primarily in processed food, so there is a  
17 certain question of essentiality there as well,  
18 for me. So I will not be voting for this.

19                   MS. DE LIMA: Tom, and then Joelle.

20                   CHAIRMAN CHAPMAN: I also know sodium  
21 phosphate from a commenter, being used in cream  
22 processing plants to prevent the fouling of the

1 lines. If it's used in the method that you're  
2 using, I believe it would be considered an  
3 ingredient and at least be labeled at that point.

4 Although I agree with you, that's not  
5 an appropriate use of this material in an organic  
6 setting. It would be open to consideration and  
7 annotation that would prevent its use in cream  
8 for mouthfeel applications.

9 But it is used in a lot of other  
10 products in necessary applications, if you want  
11 to have those products on the market.

12 MS. DE LIMA: Joelle?

13 MS. MOSSO: Just a comment in regards  
14 to essentiality; I think one could argue that  
15 meat is not essential either, and there are  
16 health implications as well. A vegetarian would  
17 not say a meat is an essential item.

18 I personally am not huge consumer of  
19 processed foods, so it's not like I'm an advocate  
20 for them. But I will say that it is an option  
21 for people to pursue. It's their choice, whether  
22 or not to include it. It is used in a very small

1 fraction of what they are consuming, unless they  
2 over-consume, which again is a personal choice.

3 So I just think in argument analysis,  
4 when we look at essentiality, I don't know that  
5 it is essential to drink alcohol, or essential to  
6 have coffee, or essential to eat meat. So I  
7 think that wasn't necessarily the same sort of  
8 argument, although I do understand where you're  
9 coming from.

10 MS. DE LIMA: Emily and then Harriet.

11 MS. OAKLEY: Yes, I agree with what  
12 you're saying, absolutely, and let me clarify  
13 that. I think that while it would require more  
14 of the other material, sodium citrate, I also  
15 think that it's probably just a lot easier, also,  
16 to rely on this material.

17 I'm not a handler, but I do think that  
18 there might be people who would consume these  
19 products, who would then also consume,  
20 potentially, a large of quantity of other  
21 processed materials, in which this material would  
22 also appear.

1                   And again, it's just more of a  
2                   cautionary principle. I also think that it's  
3                   good that we are not unanimous on everything.

4                   MS. DE LIMA: Harriet, and then Tom.

5                   MS. BEHAR: I am a little bit torn on  
6                   this material, but I also see it as a way to open  
7                   the door to consumers to a variety of products,  
8                   which then opens the door to more producers to  
9                   produce raw materials that are certified organic.

10                  And so I will be voting for this  
11                  material. But I hope that there will be other  
12                  options available in the future.

13                  MS. DE LIMA: Tom?

14                  CHAIRMAN CHAPMAN: I just want to  
15                  speak to Emily's last point. I often find that  
16                  people look to organics to be the fix-all for all  
17                  issue out there in the food system, and it's just  
18                  unfortunately not the best way to solve for the  
19                  issue of unknown consumption.

20                  The best way to address that issue  
21                  would be to have it published in the nutritional  
22                  facts panel, which is regulated by the FDA and

1 unfortunately out of our purview.

2 But I would welcome to see more  
3 disclosure in that area. As you know, I always  
4 call for more disclosure, not less.

5 MS. DE LIMA: And I echo what Harriet  
6 said. Asa?

7 MR. BRADMAN: I echo what Harriet  
8 said, but I also like Tom's suggestion that where  
9 they use it for mouthfeel and purposes where it  
10 might not be listed, it shouldn't be allowed.

11 MS. DE LIMA: Francis?

12 DR. THICKE: I notice that you said  
13 it's not used in Europe. Did you get information  
14 about how they get by without using it in Europe?  
15 How's their mouthfeel?

16 (Laughter.)

17 MS. DE LIMA: I don't know; they might  
18 just not have mac and cheese as organic in  
19 Europe, I'm not sure. I mean, we have had this  
20 discussion about the difference and --

21 DR. THICKE: Yes, we had that  
22 discussion in the spring as well, and it was

1 mostly around the application of the products.  
2 And there's applications of products common here  
3 in the U.S. that aren't in Europe and vice versa.

4 The most common usage that I saw from  
5 the comments was from dried cheese products,  
6 which might just be an American thing, very much  
7 so. But it is a large -- I don't like to name  
8 names, but Annie's is a very large company, and  
9 people know that name. There are very few  
10 American households that won't have some box of  
11 mac and cheese in their cupboard somewhere, and  
12 that's where it's used.

13 It's also used in those portable  
14 cheese salad kits that have those little packets  
15 of cheese already processed in there, that allow  
16 you to make a salad on the go.

17 While these aren't maybe necessary  
18 foods -- we struggle with this with cellulose  
19 sometimes too, when you see the cellulose  
20 processing on the list. I don't know why someone  
21 can't just grate their own cheese instead of  
22 buying pre-grated cheese, but convenience is a

1 part of the American lifestyle.

2 It began with organic products get  
3 into consumers' hands in more applications,  
4 especially where some of these other materials  
5 are labeled and present, consumers can make the  
6 choice by reading the label. This only helps to  
7 grow the organic marketplace and provide more  
8 avenues for farmers to sell their products.

9 MS. DE LIMA: Francis?

10 DR. THICKE: I was just going to say,  
11 maybe it does go well with cellulose.

12 MS. DE LIMA: All right, on that note,  
13 are we ready to vote?

14 CHAIRMAN CHAPMAN: All right, so  
15 there's a motion to remove sodium phosphates from  
16 205.605(b). The motion was made by Lisa and  
17 seconded by Tom. It's a motion to remove, so a  
18 yes vote is to remove, a no vote is to retain.  
19 The voting will begin with --

20 MR. MORTENSEN: Hey, Tom, just a point  
21 of clarification, if we can ask. Asa's point  
22 about an annotation; does that come after this

1 vote, then?

2 CHAIRMAN CHAPMAN: No; that would have  
3 to come as a separate work agenda item, to be  
4 requested of the program, added to it, a proposal  
5 developed, and then brought as a separate item.

6 MR. MORTENSEN: So that would happen  
7 after, or should we vote on this? Or should we  
8 have that annotation before we vote? I guess  
9 that's my question.

10 CHAIRMAN CHAPMAN: So we have to vote  
11 on sunset items, and move forward sunset votes  
12 independent of all those annotations. You'll  
13 notice a later vote, coming up around re-  
14 classification of potassium acid tartrate. That  
15 was from a previous sunset review we had done,  
16 and we had identified that as an additional work  
17 stream.

18 Generally, when issues are raised  
19 here, subcommittees will make note of it, take it  
20 back to the subcommittee, and the subcommittee  
21 will have a discussion as to whether or not we  
22 should proceed.

1                   So I'm going to re-read the motion  
2                   just to be clear; motion to remove sodium  
3                   phosphates from 205.605(b); motion by Lisa,  
4                   seconded by myself. A yes vote is to remove, a  
5                   no vote is to retain, and the voting starts with  
6                   Dan.

7                   DR. SEITZ: No.

8                   MR. RICE: No.

9                   MS. BAIRD: No.

10                  MS. BEHAR: No.

11                  MS. OAKLEY: Yes.

12                  DR. THICKE: Yes.

13                  MS. BRIONES: Yes.

14                  MS. DE LIMA: No.

15                  MR. BRADMAN: No.

16                  MS. MOSSO: No.

17                  MR. ELA: No.

18                  MR. MORTENSEN: No.

19                  MR. BUIE: No.

20                  MS. SWAFFAR: No.

21                  CHAIRMAN CHAPMAN: Chair votes no.

22                  Three yes, 12 no; the motion fails.

1 MS. DE LIMA: Next up, casings; Dr.  
2 Brines.

3 DR. BRINES: Thank you; just one point  
4 of additional clarification too, in terms of the  
5 question about annotation changes. One  
6 additional option is that a member of the public  
7 could submit a petition to change the annotation.  
8 That's available to any member of the public.

9 So now we're moving on to Section  
10 205.606 of the national list. That's the section  
11 for non-organically produced agricultural  
12 products allowed as ingredients in or on  
13 processed products labeled as organic. The first  
14 listing is casings from processed intestines.  
15 Thank you.

16 MS. DE LIMA: Asa?

17 MR. BRADMAN: So casings, I think is  
18 one of those materials that we generally approve  
19 routinely, and I think it will be approved today.  
20 Our committee did approve it when we voted on it.

21 But there's a kind of ongoing  
22 frustration with the lack of organic casings

1 being available, and I think that, based on the  
2 comments and some of the discussion we had last  
3 spring, there's concern that the continuous  
4 relisting of this is preventing the emergence of  
5 good entrepreneurs or the development of a market  
6 that works for organic casings.

7 I think I will vote to keep this on,  
8 but some suggestions have been made that we have  
9 a TR or TAP, and I think more in-depth discussion  
10 of how we can promote the emergence of  
11 organically-available casings for the sausage and  
12 meat industry.

13 So that's a succinct summary, I hope,  
14 and I guess we're opening it up for discussion.

15 MS. DE LIMA: Steve?

16 MR. ELA: I agree with what you say,  
17 but what I heard last spring's testimony, I  
18 interpreted differently. It's sort of like the  
19 pectin comments we had in public comment, and I'm  
20 sure we'll talk about pectin when it comes up.

21 Yes, there are organic animals out  
22 there, but the supply chain for casings -- and if

1 it were all casings were the same -- then it  
2 would be simple; organic casings or not.

3 But then when they segregate them on  
4 size and classification and things, you start  
5 parsing it out until you get to a small fraction.  
6 Then it becomes extremely difficult, especially  
7 for a perishable item.

8 And so at least what I heard was, yes,  
9 they are out there, but the way the system works,  
10 and the way you grade them makes it very  
11 difficult to establish that supply chain, just  
12 because of the small amount out there.

13 MR. BRADMAN: Right, and that's  
14 exactly what I understand too. You said it much  
15 better than I did. But still, I think there's a  
16 frustration that there's not organic material  
17 available. The question is, is there something  
18 we or the program can do to try to develop a  
19 market and resources to have better sorting,  
20 better access to it? That's where I think the  
21 frustration stems from.

22 MS. DE LIMA: Tom?

1                   CHAIRMAN CHAPMAN: I share that  
2                   frustration; I also hear oftentimes the  
3                   frustration of ranchers who raise cattle for  
4                   meat, swine, and other items. They struggle to  
5                   find slaughterhouses that will handle organic  
6                   products, and that's a huge difficulty.

7                   And so compared to a bunch of other  
8                   areas of organic agricultural growth, I think  
9                   some of these meat applications have kind of  
10                  lagged behind. In my mind, there's actually two  
11                  better ways of going about this. Regulatory and  
12                  governmental fixes might not always be them.

13                  But one is to call upon the trade  
14                  associations out there and to start looking into  
15                  it. We did something similar with celery powder,  
16                  which is also another meat application, to try to  
17                  get fixes out there from the industry  
18                  perspective.

19                  The other thing is to just eat more  
20                  organic meat. Sorry to my vegetarian and vegan  
21                  friends out there.

22                  MR. BRADMAN: Yes; I want to be clear

1 too, that I would retain this material. I was  
2 not suggesting we -- at least personally, I'm not  
3 going to vote against it. That said, there's  
4 this frustration.

5 MS. DE LIMA: Harriet, and then Sue.

6 MS. BEHAR: I'm not on the handling  
7 committee, but to me this represents kind of a  
8 deficiency with the way we deal with 606 items.

9 We look to the trade to tell us if  
10 it's out there or not. We've looked, but a lot  
11 of it, we don't understand what the barriers are.  
12 I agree with you, Steve, in what you said about  
13 the size, and maybe it's not close enough to a  
14 processing facility.

15 How much of this material do you need  
16 to start creating a market for this product? We  
17 don't typically get technical reviews on 606  
18 items, in order to answer some of these  
19 questions. We don't really even have a good  
20 checklist, even for the petitioner.

21 I realize this is a sunset item, but  
22 as we get new things on 606, to know what to ask

1       what the barriers are. How could this happen in  
2       the future? Because I think that really would  
3       give the trade even more information that they  
4       need in order to be that list of opportunities  
5       for things that they could come in do as organic  
6       in the future.

7               So it's not a work agenda item, and  
8       I'm not on that committee; but this was one of my  
9       little pet peeves, being in the peanut gallery.  
10       I felt that 606 could really be better reviewed,  
11       as far as a checklist item, and really think  
12       through the real questions that we need to ask in  
13       order to understand its placement on that section  
14       of our national list.

15               MR. BRADMAN: Yes, I agree with that,  
16       absolutely.

17               MS. DE LIMA: Sue?

18               MS. BAIRD: I echo Tom's comments. At  
19       least in my part of the world, there are a lot of  
20       livestock that are being raised organic, but  
21       there's no processing plant. So they lose their  
22       organic status category.

1 I'm not sure this should be addressed  
2 at this regulatory. We need federal monies that  
3 encourage small processing facilities and/or  
4 larger processing facilities in more regions of  
5 the United States, so that those farmers who go  
6 to the work of raising and feeding their  
7 livestock as organic don't have to lose that  
8 status at the processing level.

9 If we had more livestock that were  
10 certified organic, maybe we would have more  
11 casings that are organic. That's my comment.

12 MS. DE LIMA: Tom?

13 CHAIRMAN CHAPMAN: I have a couple of  
14 things I forgot to mention. This is a 606 item,  
15 which requires commercial availability searches,  
16 regardless. So you always have to go out there  
17 and try to find an organic process. And I'm  
18 going to go back to the trade association again,  
19 where I think in the public comments they called  
20 606 an entrepreneurial dream, which is true.

21 I mean, all this takes is an  
22 entrepreneur to set this up. You know, look at

1 the meat products that are out there. You have  
2 the certifier's name, call that certifier up and  
3 say, Hey, I've got organic casings. Tell your  
4 client that they have to source them from me.  
5 And you can charge whatever you want.

6 So that's a little business plan laid  
7 out for you; go get the funding and start your  
8 private business. Again, regulation isn't always  
9 the best way to solve some of these problems.  
10 Markets can solve them for us. The most  
11 effective way we've gotten items off the  
12 processing list has been from companies that have  
13 developed the market, come to us, petitioned us,  
14 and had them removed.

15 The other thing I want to add is,  
16 while that data request would be great, as  
17 someone who, for a profession, sources hundreds  
18 of millions of pounds of organic ingredients,  
19 that data just does not exist out there. And the  
20 request that you would have, the expertise of the  
21 panels that we have, are not qualified to do that  
22 type of work.

1 MS. DE LIMA: Dave?

2 MR. MORTENSEN: I guess there is one  
3 other thing that hasn't been brought up that's a  
4 concern of mine. When we're using conventional  
5 animals, we should in the same way that we  
6 respect them and think thoughtfully about  
7 chlorine, their diet is almost exclusively  
8 genetically-modified grains.

9 So we're running 90 percent GMO corn  
10 and 97 percent GMO soybean through the animals.  
11 There have been intestinal issues with that in  
12 conventional agriculture.

13 I'm quite concerned personally about  
14 that, and the co-mingling of GM-dependent  
15 cropping systems products in our organic systems.  
16 So I probably will vote not to renew this  
17 listing.

18 MS. DE LIMA: Harriet?

19 MS. BEHAR: Just to the point of  
20 having more slaughtering facilities; I'm a co-  
21 chair of the State of Wisconsin Organic Advisory  
22 Council, and last year, we put on two trainings

1 for veterinarians, because we had heard from our  
2 livestock farmers that they were working with  
3 veterinarian who didn't know anything about  
4 organic.

5 And so this year, our focus is on  
6 doing a training for slaughterhouses in our  
7 state, to help them understand what it would take  
8 to become organically certified.

9 So just on a little micro-level, it  
10 doesn't have to be at a federal level. It could  
11 be sections of a community or whatever. And our  
12 economic development section of our department of  
13 agriculture sees it as an economic development;  
14 that's where we're getting the money to put on  
15 the training.

16 MS. DE LIMA: All right, I don't see  
17 any more discussion. Tom?

18 CHAIRMAN CHAPMAN: Okay, this is a  
19 motion to remove casings from 205.606. It's a  
20 motion made by Lisa, seconded by Tom. This is a  
21 motion to remove, so a yes vote is to remove, a  
22 no vote is to retain. We will begin the voting

1 with Scott.

2 MR. RICE: No.

3 MS. BAIRD: No.

4 MS. BEHAR: No.

5 MS. OAKLEY: No.

6 DR. THICKE: No.

7 MS. BRIONES: No.

8 MS. DE LIMA: No.

9 MR. BRADMAN: No.

10 MS. MOSSO: No.

11 MR. ELA: No.

12 MR. MORTENSEN: Yes.

13 MR. BUIE: No.

14 MS. SWAFFAR: No.

15 DR. SEITZ: No.

16 CHAIRMAN CHAPMAN: Chair votes no.

17 One yes, 14 no; the motion fails.

18 MS. DE LIMA: Next up we have konjac  
19 flour. Dr. Brines?

20 DR. BRINES: Thank you. We're still  
21 under Section 205.606 of the national list, CAS  
22 No. 37220-17-0. Thank you

1 MS. DE LIMA: Scott?

2 MR. RICE: Thank you. Konjac flour is  
3 a material derived from the tubers of the  
4 elephant yam, primarily grown in tropical and  
5 sub-tropical regions. It is a soluble fiber used  
6 in traditional foods such as shiritaki noodles  
7 and konjac curd.

8 It is also marketed at a zero-calorie,  
9 zero-carb alternative to pasta and rice. In  
10 other settings, it's used as a binder, gelling  
11 agent, thickener, and stabilizer.

12 Earlier this year in the first round,  
13 we had asked for input on the products that are  
14 making use of this. We really have not heard a  
15 whole lot on that. One of the ingredient trade  
16 organizations did not have further information.

17 We heard from OTA during their survey,  
18 that there is one comment received that it's  
19 currently in use as primary ingredient -- not a  
20 thickener, and not aware of organic alternatives.

21 So we don't have a lot of information  
22 on what and how many products. I'm going to open

1 it up to discussion.

2 MS. DE LIMA: I'll just add that we  
3 did have CCOF say that it was listed on none of  
4 their OSPs.

5 MR. RICE: And similarly, other  
6 certifiers indicating from their queries that it  
7 was not used.

8 MS. DE LIMA: A-dae?

9 MS. BRIONES: Yes, I think this is one  
10 of those ingredients that demonstrates our  
11 inability to reach certain populations. Coming  
12 from Hawaii, I know konjac flour is used in a lot  
13 of Asia-based or Japan-based products.

14 And so when I'm talking to people who  
15 actually use the product and try to solicit their  
16 comments either through our processes; a lot of  
17 them may not be familiar with it. So I'm going  
18 to vote to not remove it, just because I feel  
19 like if we do remove it, we're closing the door  
20 before anybody walks in to some of these  
21 populations that are kind of outside our reach  
22 right now.

1 MS. DE LIMA: I'm going to call on  
2 myself and then Tom. Were any of the folks that  
3 you talked to producing products that were  
4 certified organic?

5 MS. BRIONES: Yes, two of them.

6 MS. DE LIMA: What kinds of products  
7 were they?

8 MS. BRIONES: They were mochi-based  
9 desserts, that are sold primarily in Hawaii.

10 CHAIRMAN CHAPMAN: That was my  
11 question. I was going to vote to take this off,  
12 but I was looking for something like that,  
13 evidence or someone to come forward saying that  
14 they're using it, and the applications they are  
15 using it in.

16 Knowing now that it's being used, I  
17 think I would take a deeper look at why we can't  
18 be making this organic, or where that is. But  
19 given that most of our research up to this point  
20 was around the question of whether this was being  
21 used, I had intended to vote to remove it, but I  
22 think I will be voting to retain it.

1 MS. DE LIMA: Steve?

2 MR. ELA: My sense is that there are  
3 organic sources of the flowers, from what I've  
4 heard in comments. So I guess the vote to remove  
5 doesn't remove it from the availability to use it  
6 in a product; it just removes it as a non-organic  
7 form. Am I thinking right, Scott?

8 CHAIRMAN CHAPMAN: Correct.

9 MR. RICE: When I looked at this,  
10 there are 11 folks on the operations on the  
11 integrity database that offer some form of  
12 konjac. As I mentioned in the brief summary of  
13 how it's used, those may or may not need the  
14 supply that, say, the mochi maker needs. Again,  
15 that's data that's challenging to get, but I  
16 would say that in some cases, going to the trade  
17 is exactly where we need to go to get that  
18 information.

19 And as we heard yesterday, they  
20 themselves have had a little challenge reaching  
21 out. So we may hear something further, but there  
22 are few organic supplies.

1                   CHAIRMAN CHAPMAN: And just to  
2 clarify, the 11 listings are in the OID database,  
3 is that how you got those?

4                   MR. RICE: Correct.

5                   CHAIRMAN CHAPMAN: And so those may be  
6 brokers of the same product? Someone's out there  
7 with it, but it may not be 11 people; it could be  
8 less.

9                   MS. DE LIMA: Ashley and then Emily.

10                  MS. SWAFFAR: A-dae, I just had a  
11 question for you; do you know if they've tried to  
12 source organic konjac flour, and just can't find  
13 the amount they need?

14                  MS. BRIONES: I don't have an answer  
15 for that; I don't know.

16                  MS. DE LIMA: Emily?

17                  MS. OAKLEY: I was just going to say  
18 that a lot of times, small scale farmers have  
19 talked to me or sent me personal emails about  
20 hydroponics, for example. And I copy and paste  
21 the link to regulations.gov just so that it's on  
22 the written record. I don't know if there are

1 any limitations to technology with anybody you've  
2 spoken to, but just to encourage it, even if the  
3 docket's closed at that point, to get it on the  
4 open docket later.

5 Because then it's more part of the  
6 public record, and we can more easily seek  
7 information, like the questions that are coming  
8 up right now that I don't want to disregard. It  
9 will be important to try to get it on the open  
10 docket in the future, but thank you for  
11 presenting those views.

12 MS. DE LIMA: Dan, and then Tom.

13 DR. SEITZ: So if memory serves, I  
14 thought there was a concern that some of the  
15 supply was genetically modified. Is that the  
16 case? That's sort of lodged in my head.

17 MS. DE LIMA: Scott, you want to  
18 answer that?

19 MR. RICE: We didn't get any further  
20 information on that being the case. If it's a  
21 known commercial variety, that would be something  
22 that would be looked at in the certification

1 process.

2 MR. MORTENSEN: Dan, that's not a  
3 transformed plant.

4 CHAIRMAN CHAPMAN: And even if it was,  
5 the non-GMO requirement would still play in a 606  
6 item, fully. So an agricultural product that's  
7 used in conventional form still cannot be  
8 produced with excluded methods.

9 And I just wanted to remind people  
10 that commercial availability still applies on  
11 606, which means the producer still needs to go  
12 out there and do the search and prove to their  
13 certifier that the organic forms are not  
14 sufficiently available for them.

15 I did have one question for the  
16 program, throw you guys on the spot real quick  
17 here; I think the past NOSB has passed guidance  
18 recommendations on how commercial availability  
19 searches should occur for 606 items, and I'm  
20 curious to know where that is in the rulemaking  
21 or review process.

22 DR. LEWIS: We're aware of that; we're

1 trying to balance in terms of that issue among  
2 other issues that we're working on now. We'll  
3 get back to you on that.

4 CHAIRMAN CHAPMAN: Thank you.

5 MS. DE LIMA: Scott?

6 MR. RICE: I neglected to comment; in  
7 terms of comments, we did receive a couple of  
8 comments. One mentioned the concern around a  
9 potential GE source, and just the use of  
10 conventional pesticides on conventional konjac.

11 MS. DE LIMA: All right. I don't see  
12 any other discussion. Tom?

13 CHAIRMAN CHAPMAN: Okay, we'll be  
14 moving to a vote. The motion is to remove konjac  
15 flour from 205.606, based on the following  
16 criteria from the Organic Foods Production Act,  
17 Section 2118(c)(1)(A)(ii), essentiality.

18 The motion was made by Scott and  
19 seconded by Ashley. This is a motion to remove,  
20 so a yes vote is to remove, a no vote is to  
21 retain. The voting will start with Sue.

22 MS. BAIRD: Based on A-dae, I'm going

1 to say no.

2 MS. BEHAR: Yes.

3 MS. OAKLEY: Yes.

4 DR. THICKE: Yes.

5 MS. BRIONES: No.

6 MS. DE LIMA: Yes.

7 MR. BRADMAN: Yes.

8 MS. MOSSO: Yes.

9 MR. ELA: Yes.

10 MR. MORTENSEN: Yes.

11 MR. BUIE: Yes.

12 MS. SWAFFAR: Yes.

13 DR. SEITZ: Yes.

14 MR. RICE: No.

15 CHAIRMAN CHAPMAN: Chair votes no.

16 Eleven votes yes, four votes no; the motion  
17 passes.

18 MS. DE LIMA: And our last sunset is  
19 pectin. Dr. Brines?

20 DR. BRINES: Yes, thank you. Wrapping  
21 the sunset review for 2019, the very last  
22 substance is pectin, non-amidated forms only.

1 The most recent technical report for this  
2 substance was completed in 2015. Thank you.

3 MS. DE LIMA: Tom?

4 CHAIRMAN CHAPMAN: So pectin is  
5 extracted from citrus and palm fruits, and based  
6 on tests that have been given, there is no  
7 organic source of organic extracted pectin  
8 available.

9 It's used as a gelling agent in jams,  
10 preserves, fillings, and other products. The  
11 public comment here was fairly extensive in favor  
12 of retaining the substance. There were three  
13 certifiers who also spoke on behalf of their  
14 clients.

15 Several primary users, five trade  
16 associations, and an input seller; one of those  
17 trade associations was a trade association for  
18 pectin.

19 Comments from the producers were that  
20 this was necessary, essential, and primarily used  
21 in yogurt manufacturers in their fruit preps, in  
22 jams and jellies, and by confectioners.

1                   There were questions posed by an  
2                   interest group around changing the annotation to  
3                   limit high methoxyl forms of it, and there was a  
4                   question around the impacts of conventional  
5                   agriculture when using a conventionally-sourced  
6                   ingredient.

7                   We had some dialogue around organic  
8                   sources and difficulty within the industry via  
9                   oral comment yesterday, and they expressed a  
10                  difficulty in obtaining sufficient raw material  
11                  of the right amounts to produce and standardize a  
12                  product out there for commercial sale.

13                  Another minor point that we will add  
14                  to the final notice; there was another ancillary  
15                  substance category provided in the written  
16                  comments, which was the presence of organic  
17                  acids, citric and lactic as a standardizing  
18                  agent. Those are two materials that are already  
19                  on the national organic list.

20                  MS. DE LIMA: Any discussion?

21                  Harriet?

22                  MS. BEHAR: Similar to casings, just

1 the desire to see this. But in finding out that  
2 there's no domestic production of pectin -- it's  
3 all made overseas -- was kind of interesting to  
4 me.

5           However, coming from lemons and limes,  
6 I know that a lot of the organic lime and lemon  
7 juice is not produced in the United States  
8 either. So I'm just hoping that someone will --  
9 it's a little bit harder for us to pressure  
10 foreign manufacturers to go organic, than here  
11 domestically.

12           But again, I think understanding the  
13 challenges to the organic production helps us  
14 make those decisions.

15           MS. DE LIMA: Tom, and then Emily.

16           CHAIRMAN CHAPMAN: Just to add a  
17 nuance on that; I think one of those  
18 manufacturers was in Europe, and I want to point  
19 out that this is also on the European standards.  
20 It's an allowed non-organic ingredient in all  
21 products except for meat-based products.

22           MS. DE LIMA: Emily?

1 MS. OAKLEY: I would in no way  
2 advocate for its removal, but it would be great  
3 if we could have an organic source of pectin,  
4 because peelings are often a source of high  
5 concentrations of pesticides in conventional  
6 fruits. So it would be great if we could get an  
7 organic market for it.

8 MS. DE LIMA: Steve?

9 MR. ELA: A number of years ago, it  
10 was listed as high methoxyl, low-methoxyl pectin,  
11 and it's interesting with the comments still  
12 reflecting that, even though the listing has  
13 changed to amidated and non-amidated forms.

14 I would encourage commenters to make  
15 sure they follow the new rules in referencing.  
16 And it's one of those products -- and full  
17 disclosure, we use pectin. We use an amidated  
18 form, because we want to use the reduced sugar  
19 recipe.

20 It's a little frustrating; we have to  
21 label our products, made with organic, instead of  
22 organic, because we're using the amidated form

1 because it uses less sugar.

2 So it's kind a trade-off with pectin,  
3 that they get very difficult. But I'm certainly  
4 in favor of relisting it, and I sympathize with  
5 the difficulty of trying to find an organic  
6 source. You're extracting a little bit of  
7 something out of a lot of something. You need a  
8 lot of peels to get a little pectin.

9 MS. DE LIMA: Tom?

10 CHAIRMAN CHAPMAN: Just to echo or  
11 repeat what you said; I remember you making that  
12 same comment in the spring as well. We received  
13 virtually the same comment, word for word. And  
14 it wasn't clear if they disagreed with the change  
15 to non-amidated, and were just saying we should  
16 go back to high methoxyl, or if there were the  
17 same comments sent from before.

18 MS. DE LIMA: All right, we'll move to  
19 a vote.

20 CHAIRMAN CHAPMAN: This is a motion to  
21 remove pectin from 205.606. The motion was made  
22 by Tom, seconded by Ashley. A yes vote is to

1 remove, a no vote is to retain, and the voting  
2 will start with Harriet.

3 MS. BEHAR: No.

4 MS. OAKLEY: No.

5 DR. THICKE: No.

6 MS. BRIONES: No.

7 MS. DE LIMA: No.

8 MR. BRADMAN: No.

9 MS. MOSSO: No.

10 MR. ELA: No.

11 MR. MORTENSEN: No.

12 MR. BUIE: No.

13 MS. SWAFFAR: No.

14 DR. SEITZ: No.

15 MR. RICE: No.

16 MS. BAIRD: No.

17 CHAIRMAN CHAPMAN: Chair votes no.

18 Zero yes, 15 votes no; the motion fails.

19 Real quick, back on the konjac flour;  
20 Dr. Brines, can you remind us of the sunset date  
21 of that material?

22 DR. BRINES: Yes, the current sunset

1 date is also March 15th, 2022.

2 CHAIRMAN CHAPMAN: So based on the  
3 sunset recommendation reorganization, this would  
4 remain until 2022?

5 DR. BRINES: That's the NOSB  
6 recommendation, yes.

7 CHAIRMAN CHAPMAN: Thank you.

8 MS. DE LIMA: All right. Next up  
9 we've got our one and only proposal, potassium  
10 acid tartrate. Steve?

11 MR. ELA: We just basically approved  
12 relisting this, but in the comments, the sunset  
13 has come up a number of times that the material  
14 is most likely mis-classified. It's currently  
15 classified as a non-agricultural synthetic, and  
16 the proposal is to move it to an agricultural  
17 product.

18 And so public comment was in favor of  
19 that; it's pretty straightforward, and I think,  
20 if you follow the decision tree put out by the  
21 program, it's pretty clear that it should be an  
22 agricultural, non-synthetic substance.

1 MS. DE LIMA: Harriet?

2 MS. BEHAR: So I'm hoping the  
3 winemakers out there are paying attention; if  
4 this does get moved to 606, we could have organic  
5 cream of tartar.

6 MR. ELA: And those were a couple of  
7 the public comments, saying exactly that. By  
8 putting it in this listing, the availability of  
9 an organic product would mean that it would have  
10 to be used. So it does help create a potential  
11 market for it, whereas its current listing would  
12 not.

13 MS. DE LIMA: I think we're ready for  
14 a vote. Tom?

15 CHAIRMAN CHAPMAN: This is a motion to  
16 re-classify potassium acid tartrate as  
17 agricultural and change its listing from  
18 205.605(b) to 205.606.

19 The motion is by Steve, and is  
20 seconded by Ashley. A yes vote is to accept this  
21 proposal, a no vote is to reject it; and the  
22 voting will start with Francis.

1 DR. THICKE: Yes.

2 MS. BRIONES: Yes.

3 MS. DE LIMA: Yes.

4 MR. BRADMAN: Yes.

5 MS. MOSSO: Yes.

6 MR. ELA: Yes.

7 MR. BUIE: Yes.

8 MS. SWAFFAR: Yes.

9 MR. RICE: Yes.

10 MS. BAIRD: Yes.

11 MS. BEHAR: Yes.

12 CHAIRMAN CHAPMAN: Chair votes yes.

13 So 12 yes, zero no, zero abstain, zero recuse,  
14 three absent; the motion passes.

15 MS. DE LIMA: And next up we've got  
16 our discussion document on marine materials.  
17 Scott?

18 MR. RICE: Thank you. This was a  
19 document that we posted in the spring, and due to  
20 our shortened comment time line, we thought it  
21 would be helpful to post again to prompt further  
22 comment.

1           We did receive a lot of comment on  
2 this, both written and oral. We will be  
3 considering that as we move forward and look at  
4 how we can best approach this from a consistency  
5 perspective, as far as reference, using Latin  
6 binomials, and the issue of sustainable harvest.

7           We have not had an opportunity to work  
8 further on that document with these recent  
9 comments, so I don't have a great deal to report  
10 further at this time.

11           MS. DE LIMA: Is there any discussion?  
12 Harriet?

13           MS. BEHAR: We thought that by  
14 separating it out by Latin names, it would really  
15 give us what we were looking at, but it was very  
16 interesting that the public comments revealed  
17 that that was actually somewhat of a barrier.  
18 It's difficult to separate them out, and not  
19 everyone's using them consistently, so it turned  
20 into more of a morass, I think, than we thought.

21           I guess I'm just not following it  
22 enough, but this would include also on the Crops

1 Subcommittee too, the marine products, algae  
2 products; would we be looking at sustainability  
3 there as well.

4 So it's not just for in-food  
5 ingredients; it's also as a crop input, correct?

6 MR. RICE: Correct, and I think Emily  
7 has something to add.

8 MS. OAKLEY: Yes, I was actually going  
9 to speak to that, so I'm glad you brought that  
10 up. Yes, the crop subcommittee is continuing to  
11 look at aquatic plant extracts, and I'll be  
12 discussing this over lunch today.

13 We are looking primarily in terms of  
14 environmental impact at this point, because I  
15 don't think listing Latin binomials, as was  
16 stated in the original proposal is practical,  
17 given that it's all three classes. So what  
18 really be the point of that one?

19 But we'll try to assess what materials  
20 are being used, where and how they are being  
21 harvested, and then environmental impact. We'll  
22 try to determine what might be the most practical

1 approach for the short term and also the long  
2 term. I think we'll probably come out with a  
3 discussion document in the spring, in an ideal  
4 time frame; and if not, certainly by the fall.

5 But we'll discuss it as a discussion  
6 document first to solicit public feedback and try  
7 to include a wide variety of stakeholders.

8 MS. DE LIMA: Harriet?

9 MS. BEHAR: Well, I thought we were  
10 going to try to separate them out because maybe  
11 some of them can regenerate faster than others.  
12 There are so many different details, and I'm not  
13 a marine algae farmer, so I have very little  
14 experience. I do harvest watercress though, but  
15 that's not a -- well, it's not algae, it's a  
16 plant.

17 MR. RICE: Well, yes, it is difficult.  
18 I would like to think we could still do that in  
19 some capacity, and we'll certainly explore it.  
20 But again, I haven't seen the clearest path just  
21 yet, but I appreciate all the input that's come  
22 from public comment.

1 MS. DE LIMA: Emily?

2 MS. OAKLEY: I think that one of the  
3 possible clear forward paths forward may be to  
4 apply the wild crops standard to all of these  
5 inputs, which would probably also entail, to some  
6 extent, trying to elaborate on what that might  
7 mean.

8 I think that we have a unique  
9 situation where we have an input that's being  
10 harvested from a wild ecosystem. And so that's  
11 quite a bit different from some of the other  
12 inputs that are on our list, both handling and  
13 certainly in the crops section of it. It just  
14 sheds an important aspect of light onto this.

15 MS. DE LIMA: Scott?

16 MR. RICE: To add one other thought to  
17 this, maybe to encourage certification of these  
18 crops where possible, which would provide greater  
19 oversight and address some of the issues that  
20 we're talking about.

21 MS. DE LIMA: Okay, so we're going to  
22 be moving on to a verbal update from Tom on

1       tocopherols.

2                   CHAIRMAN CHAPMAN:  Tocopherols have  
3       been on our work agenda as a possible annotation  
4       change or classification change, or additional  
5       classifications since work in 2015.  We had  
6       received comments during the sunset process that  
7       tocopherols may be commercially available in a  
8       non-synthetic form in addition to its synthetic  
9       form, and so we should encourage its use as a  
10      non-synthetic.

11                   We tried to take that action and added  
12      it to the non-synthetic, and we received comments  
13      stating that non-synthetic may not be  
14      sufficiently available.

15                   So then we attempted to keep it on the  
16      non-synthetic list, and we received comments that  
17      it might be available as agricultural.  So we  
18      attempted to keep it on all three lists, and got  
19      into a debate around listing motions, and whether  
20      or not, if it's in a synthetic form, if it's  
21      commonly used as a non-synthetic or agricultural,  
22      if we were expecting certifiers to do that level

1 of review.

2 It seems that the general practice is,  
3 if it's listed as a synthetic, non-synthetic, and  
4 agricultural, forms are generally allowed by  
5 certification agents.

6 In the technical review of several  
7 materials, the reviews themselves state the most  
8 common production method, but may not outline 100  
9 percent of all production methods when we do  
10 these reviews.

11 In looking at this in its totality, it  
12 didn't seem like it sounded like a sensible move  
13 to make this annotation change. So the handling  
14 committee came to the conclusion not to move  
15 forward with the tocopherol annotation change at  
16 this time.

17 If there is sufficient commercial  
18 availability of this material in another form, we  
19 encourage members of the public or industry to  
20 petition the NOSB to make this change, and we  
21 would take it up at that time.

22 MS. DE LIMA: Thanks, Tom. I don't

1 know if I'm supposed to ask if there are any  
2 questions from the board about that, but it  
3 doesn't look like it.

4 We have one last verbal update on  
5 ancillary substances used in cellulose.

6 CHAIRMAN CHAPMAN: Yes, this an update  
7 on ancillary substances in general, but  
8 specifically about this work agenda item in  
9 cellulose.

10 Back in 2015 -- Dr. Brines, please  
11 correct me if I'm butchering these dates -- back  
12 in 2015, we proposed a work process for the  
13 review of ancillary substances. I don't remember  
14 if it was 2015 or 2016 when we actually passed  
15 it, but it was one those two dates, and forwarded  
16 that on to the program for review.

17 That was a work agenda item that had  
18 come to us from the program. And since that time  
19 and around that time, even before we had actually  
20 proposed that, we were also in our reviews and  
21 technical reviews. And in our questions to the  
22 public asking for ancillary substances that are

1 used in substances that are on the national list,  
2 and have been accumulating these in our reviews.

3 We had been asked to go forward with  
4 an ancillary substance review for one material,  
5 which was microorganisms, as I recall, and we  
6 went forward with that one.

7 However, this proposal was still with  
8 the program and we haven't received word back yet  
9 from the program on which direction they want to  
10 go with. And as we went forward with the  
11 cellulose one, we ran into a couple of issues.  
12 Some just related to mistakes during the  
13 transition between members and others. So we  
14 thought it wasn't prudent to proceed at this  
15 time, and we have received a lot of questions  
16 from certification agents on how to proceed with  
17 guidance, just from the NOSB with the lack of the  
18 overall proposal from the program.

19 So in discussion with the program, we  
20 decided that it wasn't an efficient use of our  
21 time to do these reviews without the program  
22 command with guidance on how to handle ancillary

1 substances in a finalized and formal format.

2 So what we agreed to do, and what we  
3 are doing is continuing to accumulate ancillary  
4 substances, either via technical review, sunset  
5 process, or comments from the public. And at  
6 such a time when the program finalizes their  
7 review of ancillary substances, we will then  
8 begin work on whatever that proposal may be.

9 So at this time, we will not be  
10 continuing work on the ancillary substances use  
11 in cellulose.

12 MS. DE LIMA: Thanks, Tom. Any  
13 questions? All right, that wraps it up for  
14 handling, and we'll go back to Tom.

15 CHAIRMAN CHAPMAN: Okay. It's 12:40  
16 right now; we will break for lunch, and we'll  
17 start back on time at 2:00 with the materials  
18 subcommittee. We are in recess.

19 (Whereupon, the above-entitled matter  
20 went off the record at 12:38 p.m. and resumed at  
21 2:03 p.m.)

22 CHAIRMAN CHAPMAN: All right. We're

1 going to come to order. Okay. We're going to  
2 come back to order and continue on with our  
3 agenda. Up first -- or up next is Materials.

4 Harriet. Harriet Behar for Materials.

5 MS. BEHAR: Hello, Materials  
6 Subcommittee. So first I'm going to start with  
7 Emily, with research priorities.

8 MS. OAKLEY: All right. This is a  
9 reiteration of last year's document, with a few  
10 changes, some items removed, some items added,  
11 particularly in crops. And before I kind of dug  
12 into the public comment, I wanted to reflect on  
13 what some of the Organic Farming Research  
14 Foundation mentioned with respect to this  
15 document.

16 It wasn't on the board when this line  
17 item got added in 2012, but I think it might be  
18 nice for us to think about a way to make this  
19 document a little more user-friendly as the years  
20 go on and the priorities get added, and you know,  
21 maybe think about having a certain number of  
22 years that they stay on, and then they rotate

1 off, to make it a little bit more user-friendly  
2 for the end readers.

3 There is included this year an  
4 executive summary, which, in the past, the NOP  
5 has created. And that hasn't been included in  
6 previous proposal listings, but we wanted to put  
7 it out there so people in the stakeholder  
8 community could see what the USDA is taking to  
9 other organizations and broader research  
10 community, because they really want a one-page  
11 summary. And we know that the broader  
12 stakeholder community understands and appreciates  
13 our more lengthy language, but we have kind of  
14 two different groups who are the ultimate users  
15 of this.

16 Also, we've discussed in the Materials  
17 Subcommittee trying to find ways to get this more  
18 widely distributed. And Dave, putting you on the  
19 spot, but you were going to help with exploring  
20 ways of getting this within the broader academic  
21 community, so that people understand that these  
22 priorities are out there. And I'll let you

1 comment on that later if you want to -- or now,  
2 if you want to. So basically --

3 MR. MORTENSEN: Yeah. Emily, I need  
4 to -- still to do that. I've shared -- I have  
5 shared it, this document, with the USDA National  
6 Institute of Food and Agriculture, which is  
7 basically the main competitive grants program for  
8 all organic programs, as well as Sustainable Ag  
9 and that sort of thing. But beyond that, I have  
10 not reached out beyond that group.

11 MS. OAKLEY: Yes, Tom?

12 CHAIRMAN CHAPMAN: Would it -- would  
13 it make more sense for it to come from you or to  
14 come from -- I mean, Paul's kind of serving in  
15 this role for us. I mean, I thought that you  
16 were going to provide those contacts to Paul, and  
17 then Paul in his capacity was going to  
18 communicate it -- communicate it out to them. I  
19 don't know what's more effective. I mean, your -  
20 - this is your world, not mine.

21 MR. MORTENSEN: Yeah. I think -- I  
22 think I probably said that I would share it back

1 to, I think, you, Tom, or Paul. But I was also  
2 talking with the National Program Leader folks,  
3 because I was running a program there recently,  
4 and -- but I will definitely share it with you in  
5 the future.

6 DR. LEWIS: Just let me respond to  
7 that. What I'll -- what we'll be doing after  
8 this is voted on and indeed approved, I'll be  
9 sharing with NIFA, National Institute of Food and  
10 Agriculture, leadership. So that's what we do  
11 every year. We share this with them, and if they  
12 have any further questions or discussion, we can  
13 work with you, but that's one thing that I'll be  
14 doing after this. And I've actually noted this  
15 to them, that their leadership is aware of this.

16 And let me say, I applaud the effort  
17 in terms of what the Board has done making an  
18 executive summary. I find that helpful to kind  
19 of explain very succinctly and easily what's  
20 really the gist of what you're preparing. So  
21 thank you for doing that.

22 CHAIRMAN CHAPMAN: And we just -- we

1 want to get it out there as widely as possibly.  
2 So any way to get it out there, we're probably  
3 very thankful for.

4 MS. OAKLEY: There's another comment  
5 that's been brought up the last two years that's  
6 not a new research priority but that I think is  
7 really germane to this. From the Organic Center  
8 asking for or demanding, whichever word you  
9 prefer, organic representation on U.S. research  
10 boards.

11 So that's really a question for Paul.  
12 How might we begin that conversation to ask for  
13 representation on USDA research boards? Because  
14 I don't think it's a specific research priority,  
15 but it's something that's been noted repeatedly  
16 and I think would help accelerate these goals.

17 DR. LEWIS: Thank you. So I know we  
18 spoke about this before. Let me kind of bring  
19 that back to the Department and think about how  
20 we can play a role in that. So thank you.

21 MS. OAKLEY: So I'm going to just  
22 bring up a couple of the new research priorities

1 that had been mentioned, both in public comment  
2 here and written comment and on the webinar.

3 Those are ecology of marine algae used  
4 in organic products and production that can lead  
5 to appropriate limitations on their harvest and  
6 culture.

7 The organic, economic development  
8 opportunities that exist, which I think Handling  
9 definitely illustrated today in our conversation.

10 Soil health, biodiversity, and  
11 potential impacts. And I would also add to that,  
12 the degree to which biodiversity is being  
13 explored and augmented on farms in positive ways.

14 And research -- this is also a more  
15 broad one, but emphasizing that research be done  
16 with farmers, which I think is important.

17 I think that, to kind of circle back  
18 to what the Organic Farming Research Foundation  
19 mentioned on the webinar, you know, as this now  
20 becomes in its fifth or sixth year, we want to  
21 think about, you know, what priorities have truly  
22 gotten research traction and which ones need more

1 focus in the future.

2 So in terms of priorities that are  
3 listed that got some pretty broad support,  
4 alternatives for methionine, alternatives for  
5 copper, biodegradable biobased mulch film  
6 research, organic livestock breeding --  
7 definitely a big one -- alternatives to  
8 antibiotics, celery powder, chlorine materials.

9 So I think, you know, rather than  
10 trying to go into too much degree of support for  
11 this, I think the general consensus is that the  
12 community appreciates this document. But I again  
13 just want to stress that we try to find maybe a  
14 more robust way of streamlining it in the future  
15 too, without taking out the heart and soul of it  
16 as well.

17 Any questions or a discussion?

18 Asa? I'm sorry. Yep.

19 MR. BRADMAN: Just one discussion  
20 item. I thought Mark Lipson's comments on the  
21 webinar were very interesting, and his suggestion  
22 that there be, perhaps, some sort of external or

1 peer review of the process. And it kind of  
2 echoes what you -- what you already said, but  
3 that seemed like, to me, like a good idea, to do  
4 that. And also, I think a similar review might  
5 be also conducted to the extension programs  
6 nationally, and you know, how a larger system can  
7 better serve organic.

8 I guess I'll take that one level  
9 higher too. In my world, for example, the  
10 Department of Pesticide Regulation in California  
11 asked the National Research Commission and the  
12 National Academy of Sciences to perform an  
13 external review of their own risk assessment  
14 procedures.

15 So you know, depending on what level  
16 this went to, we could even bring something to  
17 the National Academy of Sciences or the NRC and  
18 say we want a formal external review of resources  
19 going into research to support organic, what's  
20 effective, what's not. And maybe these  
21 recommendations are a piece of it, but it seems  
22 to me that could be a document both to understand

1 how to improve the system and also a basis for  
2 obtaining more resources to implement it.

3 MS. OAKLEY: Asa, I think you just  
4 volunteered for that.

5 (Laughter.)

6 MS. OAKLEY: Right? Seriously. Any  
7 other comments or discussions?

8 MS. BEHAR: This is another place for  
9 the open docket, again, to the greater community,  
10 if there are things that come to mind, you don't  
11 have to wait for us to have a discussion document  
12 to bring it to our attention.

13 MS. OAKLEY: Steve.

14 MR. ELA: Well, and I think Mark is  
15 great. And Organic Farmers Foundation -- I was  
16 on the board, and they do a lot of that bird-  
17 dogging of paying attention to how many, you  
18 know, dollars of research are going into  
19 organics. And I think, you know, they're a great  
20 liaison to both feed this into, but then also to  
21 pull data back out of.

22 I mean, just like Asa's talking about,

1 they do pay attention. Where are these dollars  
2 going? And we should probably get some of that  
3 data from them so that we know, you know, are  
4 some of these projects being funded through OREI,  
5 and you know, so I think maybe a little more  
6 linkage there, just on a data exchange, would be  
7 useful.

8 MS. OAKLEY: I think you just  
9 volunteered for that too.

10 (Laughter.)

11 MS. OAKLEY: Any other -- Yeah. Asa?

12 MR. BRADMAN: Just one follow-up  
13 comment. I mean, I think the estimation now that  
14 organic is about five percent of food sales in  
15 the U.S. So maybe five percent of the USDA  
16 research budget should be dedicated to supporting  
17 and you know, improving organic.

18 MS. BEHAR: There actually is a marker  
19 bill put in by Chellie Pingree. I'm not sure how  
20 many co-sponsors, but it's a bipartisan bill to  
21 increase organic research to \$50 million. And  
22 there was a lot of discussion in the community of

1 the -- kind of the policy side of whether to tie  
2 it to. And we, of course, felt that we should be  
3 even higher than our sales. But I believe we're  
4 like 0.2 percent right now, of the research  
5 dollars -- agricultural research dollars go to  
6 organic. But if our argument is, what we learn  
7 in organic is useful to conventional farmers, but  
8 it's not always vice versa.

9 MR. BRADMAN: Absolutely.

10 MS. OAKLEY: Anybody else?

11 Tom.

12 CHAIRMAN CHAPMAN: I know we've had  
13 NIFA at our meetings in the past before. Is it  
14 also a good idea to invite them, perhaps, to a  
15 meeting, as well?

16 MS. OAKLEY: Paul.

17 DR. LEWIS: You know, I'll leave it up  
18 to the board's discretion. I know we had Sonny  
19 at a Board meeting, I think about, maybe two  
20 years ago. Right, so I can present this to him,  
21 and I think it'd be great to kind of hear what  
22 they're doing. And, actually, I think, and kind

1 of sharing some of the dialogue that's not really  
2 reflected in the executive summary here, in terms  
3 of what Asa mentioned about an AMS review,  
4 getting researchers involved in other areas. So  
5 yeah. I'm happy to kind of talk about that and  
6 Sam consult about it. So that'd be very helpful.  
7 I think it -- I think I found it very helpful for  
8 the Board to kind of hear what's happening in  
9 that arena.

10 MS. OAKLEY: Thank you.

11 MR. MORTENSEN: I think it could be.  
12 If we were going to do that, I would suggest that  
13 maybe we take a step down or two from the  
14 National Program -- the guy in charge of the  
15 whole thing, so that we get a bit more of an on-  
16 the-ground connection. So, that would be someone  
17 like the person at the -- the National Program  
18 leader for the Organic Research Initiative or  
19 something like that, rather than Ramaswamy, in my  
20 opinion.

21 DR. LEWIS: Right. So, what -- when  
22 I've been on panels where there is a National

1 Program lead, and describing like the grant  
2 process -- so really getting into that component.  
3 That might be helpful. They're broken down, as  
4 you know, by disciplines. So we can talk about  
5 who would be the best -- or people to have that  
6 type of conversation.

7 MR. ELA: Just -- and one last  
8 comment, I mean, you know, in the research  
9 community, again, you know, all those proposals  
10 go in. And they need peer reviewers. And I've  
11 served in that capacity. And I think it's very  
12 useful for the organic community to continue to  
13 serve on those panels. Because the only way you  
14 can say, does this -- does this proposal have  
15 relevance to our constituents, is to be able to  
16 feed back through that. And those peer reviews -  
17 - or relevancy reviews, I should say, are -- you  
18 know, they carry a lot of weight in that decision  
19 process. So it takes more time, and we all have  
20 infinite time and you know, love to volunteer for  
21 more things. But I think that's -- getting on  
22 those lists I think is really -- I don't want to

1 say a back-door way, but it's another way to  
2 support the system for organic research. You  
3 know, making sure proposals fit.

4 MS. OAKLEY: Other comments or  
5 discussion?

6 Are we ready to vote?

7 CHAIRMAN CHAPMAN: Okay. We have a  
8 motion to adopt the proposal on the 2017 NOSB  
9 research priorities. It was made by Emily and  
10 seconded by Dave. Voting will start with A-Dae.

11 A yes vote is to approve the proposal.  
12 A no vote is to reject it.

13 MS. BRIONES: Yes.

14 MS. DE LIMA: Yes.

15 MR. BRADMAN: Yes.

16 MS. MOSSO: Yes.

17 MR. ELA: Yes.

18 MR. MORTENSEN: Yes.

19 MR. BUIE: Yes.

20 MS. SWAFFAR: Yes.

21 DR. SEITZ: Yes.

22 MR. RICE: Yes.

1 MS. BAIRD: Yes.

2 MS. BEHAR: Yes.

3 MS. OAKLEY: Yes.

4 DR. THICKE: Yes.

5 CHAIRMAN CHAPMAN: Chair votes yes.

6 Fifteen yes. Zero no. The proposal is adopted.

7 MS. BEHAR: The next item on the  
8 agenda is adding additional excluded methods to  
9 the Excluded Methods Guidance Document that we  
10 have requested the NOP put together. So, just to  
11 remind everyone, there was a lot of work done  
12 over the last couple of years on -- not  
13 redefining, but adding to our current definition  
14 of what an excluded method is, which, for if  
15 people don't know, it is -- relates to genetic  
16 modification. And the technologies around  
17 genetic modification have really changed and  
18 changed focus. A lot of it used to be taking a  
19 gene from a different species and plucking it  
20 into something different. But now there's a lot  
21 of internal gene manipulation, turning genes on  
22 and off, moving them here and there.

1 I, truthfully, am not a genetic  
2 scientist. So I can't even speak all of the  
3 language, but we knew that we needed to have  
4 something that would keep up with all those  
5 changes, so that we would hold that line to  
6 genetic manipulation by human methods, besides  
7 hybridization, to remain excluded in organic  
8 production.

9 So this proposal was to add  
10 cisgenesis, intragenesis, and agroinfiltration to  
11 the list of excluded methods. And we did get  
12 quite a few comments. The previous list had  
13 about ten items -- or no. One, two, three, four,  
14 five, six, seven, eight, nine items on it where  
15 we had evaluated them to a criteria -- four  
16 different criteria for deciding if an item is  
17 produced through an excluded method.

18 And so we did the same for these three  
19 items that are in this proposal. And we listed  
20 which criteria we used to make that  
21 determination. However, it was pretty universal  
22 public comment, that people wanted a clear

1 definition, especially around cisgenesis, to make  
2 sure that everyone knew what we were talking  
3 about when we were referring to these terms,  
4 especially around the -- anything that's a  
5 product of cell fusion.

6           And so we, I think, will talk about  
7 that here. I would like to have discussion  
8 amongst the Board to see if we feel that we need  
9 to be giving definitions to everything that we  
10 add. Do we need just for cisgenesis because  
11 there's confusion about whether or not it  
12 includes cell fusion? And if we decide to have  
13 definitions for everything that we want the  
14 National Organic Program to put in, do we need to  
15 go back and give definitions for the other seven  
16 items that we had approved to go in that document  
17 before?

18           So I guess I'll leave that open for  
19 discussion.

20           DR. SEITZ: So a process question,  
21 maybe to the NOP, can you adopt a document and  
22 then continue to work on it and put it out in

1 revised form? So for instance, if we thought  
2 this was basically correct, but we wanted to --  
3 so we wanted to adopt it, but we thought that it  
4 would be helpful to include some definitions down  
5 the road, could we do that in that two-step way,  
6 or would it be better to send it back to  
7 committee?

8 DR. LEWIS: Right. I mean, I think  
9 that the challenge will be if you -- if you have  
10 a document that the Board feels requires further  
11 clarity -- that requires further clarity. So you  
12 know, maybe a challenge, let's kind of move  
13 forward if noting that you're continuing work in  
14 the area.

15 MS. BEHAR: Tom.

16 CHAIRMAN CHAPMAN: I am a creature of  
17 consistency, or at least I like to think of  
18 myself that way. So because we didn't have  
19 definitions for the first set, I'm fine with  
20 moving this forward. If we do feel like we need  
21 definitions, I think we should go back and do  
22 them for all of them. And while I understand the

1 -- what was the exchange that happened just here,  
2 but this is somewhat a document that's in  
3 process, because it has several TBD materials  
4 that we're going to continue to work against.  
5 And so you know, it's not -- it's not as final  
6 as, say, some other proposals we put forward,  
7 because there's still -- there's clearly  
8 additional work that we plan to do.

9 MS. BEHAR: Emily.

10 MS. OAKLEY: If we were to include  
11 definitions, what definitions would we use?  
12 Where would we source them?

13 DR. LEWIS: So I can try to help with  
14 that. If you want to have a conversation with  
15 some experts in that area, I can reach out to  
16 colleagues at USDA, especially such as National  
17 Institute of Food and Agriculture and others,  
18 that would be people that either do research in  
19 this area or have that type of technical skills  
20 that -- to help you understand in terms of what  
21 the scope of the definitions that they are in the  
22 biotechnology arena.

1                   MR. MORTENSEN: And I'm of the opinion  
2                   that I think the definitions would be really  
3                   helpful. So -- and I think, it would seem to me  
4                   that we could take a crack at them with the  
5                   capacity of our group, consulting with  
6                   geneticists that could help inform, and then  
7                   maybe meeting with some -- one or two folks to  
8                   like, really go over it and see if they're  
9                   defensible and really accurate and consistently  
10                  rigorous across the definitions, which, right now  
11                  they're kind of a little uneven, I would say, the  
12                  ones that are in here. Yeah.

13                  MS. OAKLEY: I'm sorry. Could I ask  
14                  him a follow-up to that? So do you think that  
15                  there's any chance that if we came up with a  
16                  definition, it might not keep up with the times?  
17                  Because I guess that's my concern about it.

18                  MR. MORTENSEN: Is this okay that we  
19                  have a dialogue? Yeah. Yeah. Definitely. That  
20                  would be a concern, Emily. The field is  
21                  exploding. The number of new methods that are  
22                  coming. And I think we're only, like, on the

1 front edge of it. So I think Tom's exactly  
2 right. This is a -- I think we need to see this  
3 as a living document that we're constantly  
4 revisiting to update it to be sure that the  
5 latest things that people are doing are -- you  
6 know, whether we pass on those or not. Yeah.

7 MS. BEHAR: Sue. Then Tom.

8 MS. BAIRD: Yeah. I -- my feeling is  
9 that definitions definitely would help. I  
10 appreciate the Program's telling us that they can  
11 bring in some experts. And of course, Dave and  
12 his group are experts, but most of us are not.  
13 And it would -- and I'm thinking certifiers and  
14 things. So if they had a definition, something  
15 that they could at least hang their hat on, it  
16 would help. As to Tom's comment that we might  
17 have to go back -- because I agree, Tom, we need  
18 to be consistent, I think that it would be  
19 advantageous for us to go back and put  
20 definitions on all of them. I'm thinking as a  
21 certifier, as an uneducated person.

22 MS. BEHAR: Tom.

1                   CHAIRMAN CHAPMAN: Yeah. I mean, to  
2 respond to some of the points about needing  
3 flexibility -- I mean, it's -- you brought up  
4 some points I was going to bring up, Sue, that, I  
5 mean, we -- this is put out to the public, to  
6 certifiers to make, you know, the certification  
7 decisions. When adopted by the Program, we put  
8 out the certifiers to make certification  
9 decisions. So like, it needs to be clear to them  
10 what methods we're using. And definitions would  
11 probably help.

12                   So with the avenue of pursuing  
13 guidance as opposed to rulemaking was where, I  
14 think, we looked for the flexibility of being  
15 able to quickly address new materials, since it  
16 didn't have to go through the rigorous -- as  
17 rigorous and laborious of a review process as  
18 rulemaking does.

19                   And so you know, I don't think the  
20 intent was to not define these to make them wide  
21 and unclear. I think it was not -- I just don't  
22 think we -- it wasn't a critique that I remember

1 receiving when we passed this originally. But  
2 the flexibility came from the format that we were  
3 looking at for -- in the sense of guidance.

4 MS. BEHAR: Other comments?

5 Asa.

6 MR. BRADMAN: Just, in general, I  
7 think definitions are a good idea, just so  
8 there's clarity and you know, sometimes in our  
9 group we'll spend hours arguing over a single  
10 word -- and just to make sure there's a common  
11 understanding. But at the same time, I don't  
12 think this is something that has to be a huge  
13 effort, that we can get consultation, we can get,  
14 you know, properly defined terms, in terms of  
15 these methods, and then that can go into the  
16 guidance document. It doesn't have to be, you  
17 know, an extensive, you know, review and  
18 evaluation of what each method is.

19 MS. BEHAR: Scott. Then Dan.

20 MR. RICE: Yeah. Some of the comments  
21 I was going to make have already been made, but  
22 just to reiterate that, you know, there is --

1 it's much easier to make a decision when you have  
2 that clarity, but also recognize that as the  
3 technology evolves, those can become outdated.  
4 So I really like the idea of keeping this as that  
5 kind of working document idea. I think that  
6 would be very helpful and again, to be  
7 consistent, having for -- defining some, defining  
8 all.

9 DR. SEITZ: Yeah. I echo both of  
10 those comments -- the last two comments and would  
11 hope that this, we could put this out in six  
12 months, knowing that it might not be perfect, but  
13 that it's important to have a statement out there  
14 about genetic modification.

15 MS. BEHAR: Dave.

16 MR. MORTENSEN: Scott's point is a  
17 very good one, I think. And that is that -- what  
18 I'm hearing Scott say, that a definition alone  
19 may not provide enough information -- maybe I'm  
20 reading into it, but may not provide enough  
21 information to base the certification decision.  
22 So when we think about writing these up, maybe we

1 just be sure that we're communicating well enough  
2 that whatever else is needed would be provided in  
3 the updated document. For example, some obscure  
4 definition of a genetic manipulation technique  
5 may not be very helpful in making a certification  
6 decision. Maybe the thing that needs to be known  
7 is that there was a molecular intervention of  
8 some kind that, you know -- that, basically,  
9 these nine things fall out immediately. The  
10 definitions don't even matter that much.

11 MS. BEHAR: Well, I'm wondering if we  
12 just made a non-substantive change by saying  
13 cisgenesis, not to include cell fusion, which was  
14 never our intention, that we could then be able  
15 to pass this document now and then work on a  
16 further guidance document that would include  
17 definitions.

18 MS. OAKLEY: Actually, Harriet, you  
19 just said, like, exactly what I was going to say.  
20 So that's a good question.

21 MS. BEHAR: We are all looking at Dr.  
22 Lisa Brines.

1 DR. BRINES: So to clarify, the  
2 question is whether making a notation in the  
3 proposal that was put forward for public comment,  
4 that it was the intent of the Subcommittee to  
5 exclude the topic of cell fusion, would be a  
6 substantive change or not. Probably a matter of  
7 opinion. And the concern with delaying this for  
8 another six months till the next meeting.

9 MS. BEHAR: I suppose it wouldn't hurt  
10 to just put it off, but I know that that was not  
11 our intention, to have cisgenesis include cell  
12 fusion.

13 MS. OAKLEY: I don't know. I'm just a  
14 big fan of progress. And I also know that what  
15 happens when things come back is they require  
16 more work than we think they will, and it just  
17 delays us in other things. But I also want us to  
18 get it right. But -- so putting both those out  
19 there.

20 CHAIRMAN CHAPMAN: Let's give them a  
21 moment to consult, to huddle. We need some hold  
22 music.

1                   MR. RICE: Francis, do you have your  
2 trumpet?

3                   CHAIRMAN CHAPMAN: I think Dan offered  
4 to sing us a song.

5                   MS. BEHAR: And that was most of the  
6 public comment, was asking for that clarification  
7 on cisgenesis. There really wasn't public  
8 comment on, we need a better definition for  
9 intragenesis or agroinfiltration.

10                  CHAIRMAN CHAPMAN: Does -- before we  
11 get an answer on this, too -- we still have cell  
12 fusion listed as a TBD. Correct? And that's the  
13 same cell fusion we're talking about?

14                  MS. BEHAR: Yeah.

15                  CHAIRMAN CHAPMAN: So I mean, that --

16                  MS. BEHAR: So -- but many felt that  
17 it fit under the cisgenesis.

18                  CHAIRMAN CHAPMAN: Yeah. I get that.  
19 I just -- I want to make sure the Program's aware  
20 of that, before they're about to answer a  
21 question that, you know, as part of this  
22 document, we have it published that cell fusion

1 is separate and as a TBD.

2 DR. BRINES: Yes. That's true. And  
3 there's also a document in the Program handbook  
4 that addresses cell fusion and establishes  
5 current NOP policy on that issue. I think Paul  
6 wanted to say a few words in terms of timing.

7 DR. LEWIS: Right. It may be  
8 beneficial to have this topic discussed again at  
9 the next meeting so we can bring together other  
10 experts from the USDA community who are working  
11 in the biotechnology arena to help explain some  
12 of these technologies to you as a group. So I  
13 wanted to bring that up. Especially, I know that  
14 some parts of the department have interest in  
15 what you're doing here. So I just wanted to  
16 raise that to your attention.

17 MS. BEHAR: So what you're saying is,  
18 they -- will we have a panel? Or what are you  
19 looking -- looking at to help us understand?

20 DR. LEWIS: At a subcommittee level,  
21 if we have a subcommittee meeting, as an example,  
22 we can bring on an expert or two, in terms of

1 helping to explain what some of these topics are  
2 from a definition standpoint.

3 MS. BEHAR: Well, I think we have a  
4 pretty good understanding of what we were  
5 excluding, because we used the criteria. But we  
6 didn't specifically define it as a method. We  
7 said, it fit this criteria. And I know that we  
8 did actually receive, through public comment,  
9 quite a few good definitions.

10 But a lot of it was because there was  
11 internal nucleus manipulation in most of these.  
12 And that's what threw it into the criteria that  
13 made it an excluded method. The exact method of  
14 that nucleus manipulation is not being defined,  
15 but it is a human manipulation at a genetic level  
16 of the nucleus of those cells.

17 So I feel like we don't need so much  
18 of an education of what they are. We -- because  
19 obviously we wouldn't have decided if they met  
20 the criteria if we didn't have a pretty good  
21 understanding of what it was. But the public was  
22 saying that they felt that definitions would be

1 useful to them, rather than meeting criteria.

2 And Tom, I think, spoke to, rather  
3 than defining something and then saying it is not  
4 allowed, we set it up instead as -- as new  
5 methods met the criteria -- that's when they  
6 would be excluded. So that actually helps a lot  
7 with -- as they maybe change a little bit or  
8 whatever. But they still have that basic  
9 criteria that they meet that puts them into the  
10 excluded method list.

11 Am I making sense? Okay.

12 DR. SEITZ: You know, if this change  
13 that you mentioned, which was intended, it  
14 doesn't amount to a substantive change -- and I  
15 don't know if a decision was made on that -- it  
16 does seem to me that it would be preferable to go  
17 ahead with this and then have this with the  
18 understanding it's a working document.

19 But I don't know if it was a -- I  
20 mean, you said that it's a toss-up whether it's a  
21 substantive change or not. I mean, if you want  
22 to leave it to us, that's --

1 (Laughter.)

2 DR. SEITZ: -- that's fine.

3 DR. BRINES: Yeah. Some issues are  
4 not so black and white. They're more along a  
5 spectrum. I guess that my -- I don't know  
6 whether it would be a substantive change or not  
7 at this time.

8 I'm not clear on what the harm would  
9 be in delaying a decision on this topic, given  
10 that the Board has several items that could be  
11 added going forward. There's still a lot of TBD  
12 decided. It seems like the Board -- rather, the  
13 Subcommittee was clear on what their intent was  
14 with the proposal. So from that perspective, it  
15 would not be a substantive change.

16 But given that there might have been  
17 some confusion from other stakeholders about what  
18 is intended because of the lack of definition,  
19 I'm not sure what the harm is for exploring that  
20 at a future meeting. So -- that's just what to  
21 think about.

22 I don't -- timing-wise, I don't think

1 a delay of six months is going to impede progress  
2 by the Program in taking action on this, given  
3 that there's still more work to do before we  
4 would be able to implement any recommendations.

5 MS. BEHAR: Emily.

6 MS. OAKLEY: Well, I was just going  
7 to echo what Dan said.

8 MS. BEHAR: Other comments?

9 Well, my comment would be in response  
10 to Dr. Lisa, that I know that the organic  
11 community wants to see us moving forward on these  
12 items, and we try to take little bites for each  
13 meeting. And so I think we would like to move  
14 ahead and vote.

15 Joelle.

16 MS. MOSSO: Just something to ponder  
17 is that the USDA, with their team of experts, is  
18 offering to help with the definitions of a  
19 technical field that we may at a further point  
20 regret not having accepted.

21 MS. BEHAR: I think that we could go  
22 ahead and vote on this and then have on our work

1 agenda, providing definitions at the next  
2 meeting, as well as possibly taking yet another  
3 little bite on some of the other to-be-  
4 determined, perhaps even the cell fusion, just to  
5 address the public concern over clarity in that  
6 specific area. Because it was just that one that  
7 we received most of the comments on. It wasn't  
8 the other two items. It wasn't the other seven.  
9 It was specifically on that one.

10 Joelle.

11 MS. MOSSO: I will also say that a lot  
12 of these genetic techniques are very new, and  
13 there's probably not a lot of people in a  
14 community that's non-GMO that follow it. So I  
15 think we should just keep that in mind as well.  
16 Like, I constantly keep seeing new techniques  
17 that are in the news. And I mean, I took a lot  
18 of genetics. I never learned anything about  
19 them. So I just think we should keep that in  
20 mind too, because it is rapidly evolving, and our  
21 population base would be biased in that they  
22 don't pay attention to that necessarily.

1 MS. BEHAR: And I think the intention  
2 of this document is that the to-be-determined  
3 list will be, perhaps never-ending, but it will  
4 at least always be growing, as we become aware of  
5 new methods that we might want to consider.

6 Paul.

7 DR. LEWIS: I like the conversation  
8 about the flexibility, because I mean, I think  
9 what we're all seeing in this emerging  
10 technology, there's advances occurring daily that  
11 we're not aware of. And to have that flexibility  
12 in technologies coming about -- and even as you  
13 develop your definition, think about not having  
14 something that's so set, where you know that  
15 certain methodologies will be changing over time  
16 -- I think that will be a helpful exercise, I  
17 think, for all of us.

18 MS. BEHAR: Another thing that I can  
19 see, perhaps, would be when we are developing  
20 definitions, that we make sure we are including  
21 the criteria that we've used. And so that would  
22 then meld better with the current document that

1 we have, because there are definitions out there,  
2 but they may not be using the same criteria that  
3 we are having here. So that way, that would  
4 bring the consistency -- I see Tom shaking his  
5 head. So that's -- I always like to see him in  
6 assent.

7 Steve.

8 MR. ELA: I'm struggling with this,  
9 because I would like to see it passed. And yet  
10 given our track record of trying to develop  
11 definitions that are not -- I mean, these should  
12 be pretty straightforward, but it is an evolving  
13 technology that -- and I'm not sure it is a slam-  
14 dunk. And so I'm personally hesitant to pass  
15 something that we say we're going to define  
16 later, knowing that sometimes making definitions  
17 is not always as easy as it might seem. So it --  
18 I guess I'm torn, but I'm kind of leaning  
19 towards, I'd rather see it all in one document at  
20 the same time.

21 MS. BEHAR: Joelle.

22 MS. MOSSO: Just to, kind of, echo

1       what Steve is saying, is that the public also  
2       hasn't seen those definitions. So they haven't  
3       had comment. They've had comment on these terms,  
4       but not necessarily the actual definition.

5               MS. BEHAR: Yeah. Next -- at the next  
6       meeting, we would have it as a public docket to  
7       have those definitions in place. But we -- I  
8       mean, I feel like we do -- we have the criteria.  
9       We have reviewed it to the criteria, similar to  
10      what we did for the other seven. So I don't -- I  
11      think that it's -- and it's also very clear that  
12      cell fusion has been pulled out. So even though  
13      the public was confused, we have said that we  
14      haven't decided on cell fusion and not considered  
15      it part of cisgenesis.

16             MS. MOSSO: I think -- I mean, I think  
17      I'm just -- going from a process perspective,  
18      though, I find it rather odd. I mean, I have no  
19      opposition to any of -- getting rid of these  
20      things. It's just more from a process  
21      perspective, is that the public hasn't seen the  
22      definition. So they haven't commented on it.

1 Not that that would necessarily change the  
2 outcome. I wouldn't expect it to. I just think  
3 from a process perspective.

4 MS. BEHAR: Other comments?

5 Emily.

6 MS. OAKLEY: I would just say that  
7 it's better that we're unanimous on this vote.  
8 So if there's anyone who couldn't vote on it  
9 today, even though I think we -- I would like to  
10 vote on it, if there are others that couldn't,  
11 it'd be better to send it back -- which is not  
12 what I want to do, but I'm just saying.

13 MR. MORTENSEN: I'll just kind of  
14 throw my two cents in. I actually like the idea  
15 of having a document that is a living document,  
16 and it's quite clear here that the following  
17 methods are under review. In some ways, to me,  
18 that's inviting input from our community. We  
19 haven't -- we haven't finished that body of work  
20 yet, and I think it's inviting folks to  
21 contribute. It's also inviting folks, in my  
22 view, to say gosh, why didn't you include these

1 other three methods that are not in your -- in  
2 your table on methods -- will continue to be  
3 researched. So I'm of the opinion that it's sort  
4 of inviting comment and engagement with our  
5 community. And that's a good thing. So I'm  
6 ready to vote. So I guess it's a fundamental  
7 difference of view on how finished it should be.

8 MS. BEHAR: Steve.

9 MR. ELA: Sorry. As a matter of  
10 order, would it be appropriate to make a motion  
11 to send it back to committee, vote on that? If  
12 that vote fails, then I'm comfortable with going  
13 ahead and voting on the proposal, and you know,  
14 and I would probably vote for it at that point.  
15 My preference would be to send it back, but I'm  
16 not going to vote no.

17 CHAIRMAN CHAPMAN: Yeah. That's a  
18 method we could use. If you -- if we do not want  
19 to vote on this item at this meeting, we will  
20 need to send it back to the Subcommittee.  
21 Otherwise, you know, it's a seconded motion from  
22 the Subcommittee. So we will proceed to a vote

1 when we're done discussing it.

2 MR. ELA: I mean, I would be willing  
3 to make that motion and vote on it. If the vote  
4 fails, I'm willing to vote, you know, for it.  
5 But I sense some ambiguity in the Board of  
6 whether we want to vote on it today or not. So I  
7 would make a motion to send it back to committee.

8 CHAIRMAN CHAPMAN: I have a motion.  
9 Is there a second?

10 MS. MOSSO: Seconded.

11 CHAIRMAN CHAPMAN: So I have a motion  
12 to refer this proposal back to the Materials  
13 Subcommittee. It was made by Steve and seconded  
14 by Joelle. Any further discussion?

15 You're still running it, Harriet.

16 MS. BEHAR: I would like some clarity  
17 from the Program on what is an open document. So  
18 we have given this to you as guidance, and -- but  
19 yet there's many to-be-determined items. And we  
20 see that there could be a continuous flow of to-  
21 be-determined items on here. Are you waiting for  
22 everything to be decided before you would start

1 looking at writing guidance? Or -- because that  
2 would help me understand better -- if you're  
3 going to wait two years, then it wouldn't matter  
4 if we voted right now or not, because it's not  
5 going to happen. But I would hope that at some  
6 point, we'll -- they'll -- the Program would say  
7 okay, we're here. The things that have been  
8 voted, we can move forward with, and maybe even  
9 the guidance, we'll say these things are still  
10 under review by the NOSB for further guidance in  
11 the future. But I don't know what your process  
12 is.

13 DR. LEWIS: So from a Program  
14 standpoint, we haven't made any decisions about  
15 how best we want to proceed. But I think this  
16 topic is unique in certain ways, in that it's a  
17 technology that's evolving. So I think what we  
18 all can see is over time there will be new  
19 technologies, new items to be added. So at least  
20 to kind of go back to my initial point, is that,  
21 we haven't made any decisions yet how best we  
22 want to proceed at this time.

1 MS. BEHAR: Dan.

2 DR. SEITZ: I just want to say, I  
3 agree with Steve that if this is not sent back to  
4 committee, I would want to vote in favor of it,  
5 because I think it's a very carefully researched  
6 document and one that's going to be very useful  
7 for us.

8 MS. BEHAR: And I guess, I'd just like  
9 to say too that the public supported all of them  
10 to be listed as excluded methods, with the  
11 clarification that cell fusion was not included  
12 in cisgenesis. That was the main public issue.  
13 It was -- there was no one saying any of these  
14 three items should not be -- actually, it was  
15 great support to add them to the list.

16 Joelle.

17 MS. MOSSO: Yeah. I think my  
18 opposition is simply from a process as well as  
19 lacking clear definitions for the public prior to  
20 voting. But I did want to make a comment to the  
21 Program on the sense that this is a rapidly  
22 evolving, you know, field. And there's concern,

1 at least on my part, is that very quickly  
2 something could be included into the Program  
3 accidentally, because it moves faster in  
4 evolution than we do. And I'm just wondering if  
5 there's any sort of way to fast-track or create a  
6 system that can respond as quickly as the  
7 environment changes in that respect.

8 DR. LEWIS: Yeah. That's a good point  
9 for us to kind of think about how we can be fluid  
10 in this case -- is how can we be aware of these  
11 changes that are occurring? So we have -- we  
12 have conversations with experts in our  
13 organization department, and obviously with you  
14 as a board, in terms of raising these issues to  
15 us. I think that's a very valid point. That's,  
16 I think the theme I've been hearing for the past  
17 hour in terms of -- this is an area of science  
18 that's evolving very quickly. And we, as a  
19 Program, need to be aware of making those  
20 adjustments as needed.

21 MS. BEHAR: Ashley.

22 MS. SWAFFAR: Yes. So I would like to

1 see this go back. Not that I do not support this  
2 whatsoever, but I just come from the same place  
3 Joelle's coming from -- is from a process  
4 standpoint, is we really do need some definitions  
5 on this. And you know, I think it's wonderful  
6 that the Program has offered expertise within  
7 USDA to help us get those definitions right,  
8 because this is a very confusing world if you  
9 don't live in it. And you know, we need to get  
10 it right. Because everyone in this room wants to  
11 exclude the majority of all of these methods. So  
12 we need to make sure we get the definitions  
13 right.

14 MS. BEHAR: Other? Oh. Lisa.

15 MS. DE LIMA: So based on what Ashley  
16 just said, that is, is it a -- are people  
17 thinking that we go back and do definitions on  
18 the original ones that we passed, to Tom's point  
19 about being consistent?

20 What is the will of the board?

21 MS. BEHAR: Tom.

22 CHAIRMAN CHAPMAN: Yeah. I would say

1 we do all if we're doing them.

2 MS. BEHAR: I think though, too, that  
3 when we build the definition, we have to be  
4 prepared that they also will be living  
5 definitions as well. And that was the main point  
6 of looking at them through the criteria, is so  
7 there wouldn't be this constant changing and  
8 modification of a definition, but more of the  
9 overall method that is being used. Because -- I  
10 mean, I don't understand, you know, all the sub-  
11 particle, cell, you know, aspects, but the  
12 criteria are very clear and easy for me to  
13 understand somewhat where they come from.

14 And so I have Lisa and then Emily.

15 MS. DE LIMA: All right. So folks  
16 know where I'm on -- I'm standing on this, I'd  
17 rather not send it back, and I'd rather vote on  
18 it without the definitions. That's where I'm at  
19 right now.

20 MS. OAKLEY: I agree with that, and I  
21 also think that this is evidence of what happens  
22 when you lose historical knowledge. And Zea was

1 the one who worked on this. And I wish we could  
2 ask her why there weren't definitions, because  
3 I'm sure she addressed that at some point. Maybe  
4 Tom remembers. I'll just say quickly though  
5 that, ironically, I have a hesitation to include  
6 definitions, because I am concerned it could box  
7 us into something that we wouldn't necessarily  
8 want. But I'm not an expert.

9 MS. BEHAR: Tom.

10 CHAIRMAN CHAPMAN: Yeah. So I -- this  
11 whole time, and I think even while we were  
12 talking in Subcommittee assumed there weren't  
13 definitions in the previous proposal. And I  
14 pulled it up, and unfortunately, actually, I  
15 think we are incorrect in our statements. I  
16 always stop when I get to the part that says  
17 motion by, seconded, yes, no, yada yada yada, but  
18 looking back at the -- it's not the one on the  
19 screen. Looking back at the one we passed in  
20 2016, after that page, there's an Appendix A  
21 that's a brief description and additional  
22 citations for terms used in excluded methods,

1 terminology chart, of which, to call these  
2 definitions might be a stretch of the word  
3 definition, but they are a description of those  
4 terms. So I wasn't aware of this. So I was  
5 going on the basis of consistency. And now that  
6 I am aware of this, I guess I'm going to agree  
7 that we should send it back.

8 MS. BEHAR: Well, in this --

9 CHAIRMAN CHAPMAN: So this is in the  
10 2016. So for folks that don't fully remember or  
11 weren't here for the full history of this, we  
12 passed a proposal in 2016 to further define and  
13 go into detail around what excluded methods  
14 meant. And we passed principles and definitions  
15 of technique -- no. Not techniques. Definitions  
16 of certain terms that appear in the excluded  
17 methods, that we recommended for guidance. And  
18 then, in addition to that, had a chart. And  
19 then, in the chart, we applied the criteria to  
20 make a determination of whether it met those  
21 definitions under excluded methods. That's the  
22 kind of process we used to make these

1       determinations.  So at the end of that document -  
2       - not the one we have before us, but the one from  
3       2016, there's an Appendix A with some level of  
4       description of that chart.

5                   MS. BEHAR:  Is that the one you were  
6       talking about that has genetic engineering,  
7       genetically modified organisms?  That one?

8                   CHAIRMAN CHAPMAN:  No.  Here.  I'll  
9       just show it to you.

10                   Yeah.  Michelle can go to it.  If you  
11       have internet, it's part of our recommendations  
12       from Fall 2016.  You have it?  Okay.  Scroll  
13       down.  Is that this one?  That's the -- no.  Keep  
14       scrolling down.  Scroll down.  This is the 2016  
15       one?  Yeah.  Scroll down.  Down, down, down,  
16       down.  No.  That's 2017.  That's not the 2016  
17       one.

18                   MS. BEHAR:  So the original seven have  
19       descriptions of what they are, not necessarily  
20       listed as a definition.  So I guess, to be  
21       consistent, we could make further descriptions.  
22       We could bring out a document that called them

1 all definitions.

2 CHAIRMAN CHAPMAN: Yeah. I mean,  
3 whether we want to further work on these, or we  
4 determine that the descriptions here were  
5 sufficient and we provide similar descriptions  
6 for the three additional techniques. But I think  
7 we should be consistent. And so I was with you  
8 guys until I saw this. I'm sorry. I do think we  
9 should send it back.

10 MS. BEHAR: Sue.

11 MS. BAIRD: Would the Program want to  
12 look at our descriptions of the seven and review  
13 them with your experts, along with helping with  
14 the descriptions of these?

15 DR. LEWIS: We can review them, but I  
16 think what we're getting to as a group is clarity  
17 of how we're defining these technologies. So let  
18 me talk to folks in the Department who are  
19 experts in this area, this technology and kind of  
20 think about how we can best move forward in this.

21 Let me also add is that not only the  
22 three now and the ones previously, but the TBDs,

1 we can also use that opportunity to kind of move  
2 forward and to address the ones that -- in  
3 thinking about moving forward. So we can have  
4 this conversation retrospectively and also  
5 prospectively, if you will.

6 MS. BEHAR: Would it be acceptable,  
7 when we do further descriptions and definitions,  
8 to have a disclaimer at the top of that, that  
9 says these may be modified as the technologies --  
10 I wouldn't want to put something in the docket  
11 that was so -- that was too cast in stone,  
12 because things are so rapidly changing. So I  
13 just want to make sure that that kind of -- I  
14 think that could have been one of the reasons why  
15 they were descriptions instead of definitions,  
16 because we didn't want to be so prescriptive and  
17 leave ourselves open to more rapidly respond as  
18 things changed.

19 DR. LEWIS: And I would not be  
20 surprised when we -- when you begin that  
21 conversation with those experts, that's probably  
22 going to be the initial point of consensus is

1 that, having a definition at -- where there's  
2 agreement at a subcommittee level, as an example,  
3 knowing that the flexibility is required. Of  
4 course, the science is evolving as we speak.

5 MS. BEHAR: Emily.

6 MS. OAKLEY: I forgot.

7 MS. BEHAR: Well. Dave.

8 MR. MORTENSEN: I do feel -- I will  
9 just say -- and I totally respect the differences  
10 of opinion around the table. I feel a certain  
11 sense of urgency on things like this.

12 And let me just very briefly tell you  
13 why. I have some colleagues who last week were  
14 told they couldn't travel to present at a climate  
15 change conference because of a federal decree on  
16 federal scientists not speaking about climate  
17 change last week. I have a concern that we start  
18 having creep -- administration creep -- and I  
19 don't mean NOP here. But administration creep  
20 that starts to somehow try to shape our agenda.

21 So that's part, in the back of my mind  
22 of why I'd like to vote on this right now. But I

1 totally get the reason why we need complete  
2 definitions -- or would like complete definitions  
3 as well. So I see both sides.

4 MS. BEHAR: Emily.

5 MS. OAKLEY: I remembered. I don't  
6 want to put you on the spot, A-Dae, but I know  
7 this is an issue that's near and dear to your  
8 heart. So, I was just wondering if you had an  
9 opinion, and if you would share it if you did.  
10 But if you don't want to, that's fine.

11 MS. BRIONES: Yeah. Talking over with  
12 some of my colleagues here. I would love to vote  
13 on this. I -- I'm thinking about how you enforce  
14 this without definitions, given that we have  
15 other definitions for the previous seven, it does  
16 make me want to have definitions, just for  
17 enforcement and some guidance for the community.  
18 Because if we're wishy-washy, kind of, on this  
19 Board, I can only imagine how that translates  
20 when it comes to actually enforcing this  
21 document.

22 MS. BEHAR: Other comments? I know

1 the clock is ticking.

2 Dan.

3 DR. SEITZ: Yes. I mean, I think  
4 there's some temperamental differences too. I  
5 feel comfortable living with a certain amount of  
6 incompleteness, and I feel that the urgency  
7 outweighs that. And that because it's evolving,  
8 we might in six months be back here saying, it's  
9 still not quite clear. We still need some people  
10 to weigh in. And then, even experts disagree on  
11 things. And, so, I don't know that there's this  
12 other group that will have the definitive answers  
13 for us. So, I -- I certainly, as if this is a  
14 living document, would appreciate other people's  
15 perspectives on it, but I don't know that we  
16 would -- we should assume that because there's a  
17 group there that has some expertise, they  
18 necessarily would have a final word on this  
19 either. So, I would feel comfortable moving  
20 ahead. But, then again, I don't mind a little  
21 chaos. Okay. So -- anyway.

22 MS. BEHAR: Other comments?

1 Francis, you haven't said anything.

2 DR. THICKE: Let's just do it.

3 (Laughter.)

4 MS. BEHAR: Joelle.

5 MS. MOSSO: Just trying to get  
6 creative here. Is there any other way that we  
7 can address definitions, or a system that would  
8 be more fluid to address these rapidly evolving  
9 technologies? Because they literally happen  
10 overnight. Like, even if we passed this today,  
11 they're irrelevant in some ways because there's  
12 another method. I'm concerned -- I'm very much  
13 concerned about what we've heard about not making  
14 a -- you know, a decision, as well as not making  
15 a decision and then being in a position where it  
16 is like, well, it was in flux, two years later  
17 when we regret that we didn't. So, I --

18 MS. BEHAR: Yes. And it could be,  
19 like, within the methods that are being used,  
20 there's just a little tweak that we didn't  
21 anticipate and didn't have it in our definition.

22 MS. MOSSO: I'm just wondering if

1 there's some sort of process where we can have  
2 some portion of a document be more living.

3 MS. BEHAR: I believe Paul did say  
4 that that was possible.

5 DR. LEWIS: The document that you  
6 presented here is a living document, because you  
7 have three topics that you're voting on and  
8 knowing that there are other technologies that  
9 you identified TBD. So, I think you've already  
10 presented this as a living document.

11 MS. BEHAR: Sue.

12 MS. BAIRD: Just a question, and maybe  
13 this has been covered, but we've covered so many.  
14 We've gone back and forth. I'm confused. Can we  
15 pass this because we do have these TBDs, to-be-  
16 determined things? Can we pass it, and then,  
17 because it is a living document, we can go back  
18 and add definitions to what we've already passed?

19 MS. BEHAR: That is my understanding.  
20 The question, I think is, is it consistent --

21 MS. BAIRD: Right.

22 MS. BEHAR: -- to put something as an

1 excluded method without either a description or a  
2 definition?

3 MS. BAIRD: But, if it's to be  
4 determined, then --

5 MS. BEHAR: No. We have three things  
6 that we're trying to --

7 MS. BAIRD: Yes. I know you've got  
8 three now. But we've already said it's going to  
9 be a living document, to be added to.

10 DR. SEITZ: Maybe we just be TBD in  
11 the definition boxes.

12 MS. BEHAR: That's an option. So, I'm  
13 just wondering if we're ready to -- Jess, do you  
14 have anything to say. You're looking at me like  
15 you want to say something.

16 MR. BUIE: Yes. No. Because, it's a  
17 scientific document, you know, the definitions  
18 need to be there. But, I -- you know, since it's  
19 a living document, I think it's something we can  
20 go forward with and, you know, work within those  
21 bounds.

22 MS. BEHAR: Does anybody want to call

1 the question? Emily.

2 MS. OAKLEY: Just one, quickly. I  
3 think it's a living document much like the  
4 research priorities document is a living  
5 document.

6 MS. BEHAR: Anybody else?

7 CHAIRMAN CHAPMAN: Okay. So, we have  
8 a motion to refer this back to the subcommittee.  
9 The motion was made by Steve and was seconded by  
10 Joelle. Since this is not a vote to conduct  
11 business, as a procedural vote, it follows  
12 Robert's Rules of Order, which, for this, would  
13 be a simple majority. So, a yes vote on this  
14 motion would refer it back to subcommittee. A no  
15 vote would continue discussion of this document.  
16 The voting will start with Lisa.

17 MS. DE LIMA: Yes.

18 MR. BRADMAN: No.

19 MS. MOSSO: No.

20 MR. ELA: Ironically, no.

21 MR. MORTENSEN: That means we're going  
22 with it?

1 PARTICIPANT: Yes.

2 MR. MORTENSEN: No.

3 MR. BUIE: No.

4 MS. SWAFFAR: Yes.

5 DR. SEITZ: No.

6 MR. RICE: Yes.

7 MS. BAIRD: Yes.

8 MS. BEHAR: No.

9 MS. OAKLEY: No.

10 DR. THICKE: No.

11 MS. BRIONES: No.

12 CHAIRMAN CHAPMAN: Chair votes yes.

13 Five yes. Ten no. The motion fails.

14 Discussion continues, or we can move to the vote.

15 That's fine.

16 MS. BEHAR: Are we ready to vote,

17 then?

18 Okay.

19 CHAIRMAN CHAPMAN: Can you go back to

20 the other one? That was the Appendix A, by the

21 way.

22 All right. So, we have a motion from

1 the subcommittee to accept the two sections of  
2 the proposal as stated above, and that is the --  
3 that is the chart and the TBD. Is that correct?  
4 So, that's the revising the chart to add the  
5 yeses and to retaining the TBDs that we have in  
6 there already. Can you scroll back down?

7 The motion was made by Harriet and  
8 seconded by Dan. So, this is a motion to approve  
9 this proposal. So, a yes vote is to approve. A  
10 no vote is to reject it.

11 And the voting will start with Lisa.

12 MR. ELA: Can I have a question of  
13 order?

14 CHAIRMAN CHAPMAN: Yes.

15 MR. ELA: Are we making the change?

16 So, the motion is with the change to --

17 CHAIRMAN CHAPMAN: No. That would  
18 have to come as a separate amendment.

19 MR. ELA: Okay. I just wanted to put  
20 it --

21 MS. BEHAR: And the reason for that is  
22 that cell fusion is listed as still to be

1 determined, in the chart.

2 CHAIRMAN CHAPMAN: Are we still clear  
3 on what we're voting on? I'm seeing general head  
4 nodding. So, the voting will start with Asa.

5 MR. BRADMAN: Yes.

6 MS. MOSSO: Yes.

7 MR. ELA: Yes.

8 MR. MORTENSEN: Yes.

9 MR. BUIE: Yes.

10 MS. SWAFFAR: Yes.

11 DR. SEITZ: Yes.

12 MR. RICE: Yes.

13 MS. BAIRD: Yes.

14 MS. BEHAR: Yes.

15 MS. OAKLEY: Yes.

16 DR. THICKE: Yes.

17 MS. BRIONES: Yes.

18 MS. DE LIMA: Yes.

19 CHAIRMAN CHAPMAN: Chair votes yes.

20 Fifteen yes. Zero no. The motion  
21 passes.

22 MS. BEHAR: So, I will just say that

1 our subcommittee will continue to work on this  
2 document.

3 MS. BEHAR: So, the material  
4 subcommittee has one more item, a discussion  
5 document on seed purity. And Dan, maybe you  
6 would like to talk about how we've changed the  
7 name.

8 DR. SEITZ: Sure. Well, first of all,  
9 I just want to let everyone know, we're not  
10 trying to set a record with the number of  
11 discussion documents on this issue.

12 (Laughter.)

13 DR. SEITZ: The reason this is a  
14 discussion --

15 PARTICIPANT: The record?

16 DR. SEITZ: Oh, I don't know what the  
17 record is. But the reason this is a discussion  
18 document is we decided we really need to develop  
19 a proposal, but we weren't ready to develop a  
20 proposal. But we wanted to keep this on people's  
21 minds. So, we put this out as a discussion  
22 document referencing previous discussion

1 documents, and just inviting the general public  
2 if -- and stakeholders, if they have any further  
3 comments on this topic, they're welcome to submit  
4 those in the -- using the open docket. We had  
5 been calling this seed purity. And then, in the  
6 interest of causing confusion, I changed the name  
7 to seed integrity. But maybe we'll stick with  
8 seed purity, just because --

9 MS. BEHAR: No. Genetic integrity.

10 DR. SEITZ: Oh. Right. Well, okay.

11 I think we'll have to, you know --

12 MS. BEHAR: So, do we --

13 DR. SEITZ: -- finalize our  
14 terminology on this. But, in any event, whatever  
15 we call it, there were just a couple comments.  
16 Both referenced the request of the NOSB to the  
17 NOP that a task force be formed to look at this  
18 issue, because it is a very complex issue. And I  
19 don't know if there's been any movement on that,  
20 consideration of that. Perhaps, Paul, you might  
21 let us know.

22 DR. LEWIS: Sure. So, one thing we've

1       been saying since the beginning of the meeting,  
2       we have new leadership that's -- that arrived. A  
3       new acting deputy administrator. So, as Ruihong  
4       Guo comes on board, you'd want to share this with  
5       her. So, I'm looking forward to briefing her  
6       next week, in terms of what were discussed today,  
7       including this document.

8               DR. SEITZ: Great. Thanks.

9               PARTICIPANT: And the only other.

10              DR. SEITZ: The only other piece is  
11       that people recognize that this is a very complex  
12       issue, one that would benefit by gathering data.  
13       It's not something that will be easily solved in  
14       a short period. But it is the subcommittee's  
15       intent to at least try to bring a proposal to the  
16       spring meeting.

17              MS. BEHAR: I have a comment. One of  
18       the reasons why we were looking at changing the  
19       name of seed purity is that a lot of times that  
20       has to do with whether there's foreign matter,  
21       weed seed, or whatever in the seed. And that  
22       really is not what we're trying to get at here.

1 We're trying to get at the genetic integrity of  
2 the seed, and specifically that it is free of  
3 genetic modification -- genetic contamination.

4 DR. SEITZ: Thank you Harriett. Any  
5 other comments?

6 MS. BEHAR: Okay. Guess what? We  
7 don't have to vote on that one. Go forth and  
8 prosper, Dan.

9 CHAIRMAN CHAPMAN: Thank you, Harriet.  
10 That concludes the material subcommittee portion  
11 of the agenda. And we'll move on down the  
12 agenda.

13 Up next would be deferred proposals  
14 and final votes. So, we went from just on time  
15 to ahead of time. Jumping ahead, we're now on  
16 subcommittee work agendas. And we'll be pulling  
17 it up. Once it's up, we'll run through the  
18 subcommittee agendas in order, asking the  
19 subcommittee chairs to briefly discuss their  
20 upcoming work.

21 So, up first is CACS. Scott.

22 MR. RICE: Thanks, Tom. As I

1 mentioned earlier and in our discussion, we had a  
2 request from the Program to add the issue of  
3 imports to our work agenda. And that's something  
4 that we'll be heading into the winter to work on.  
5 We are coming back to our document on -- well, we  
6 re-scoped our look dealing with inspectors, to  
7 focus in on inspector qualifications. So, we'll  
8 be taking a look at that as well. And that is it  
9 at this time.

10 Oh. Excuse me. Thank you, Harriet.

11 And we did refer native ecosystems back to the  
12 subcommittee. So, there is that as well.

13 Thank you.

14 CHAIRMAN CHAPMAN: Yes. I will --  
15 we'll add that in here.

16 Any questions for Scott?

17 Emily.

18 MS. OAKLEY: I know that there are  
19 some on our committee who are interested in  
20 looking at the possibility of adding fracking to  
21 our work agenda. And, so, I wanted to ask a  
22 question to Paul, specifically, what that might

1 take.

2 DR. LEWIS: Sure. Thank you. So, in  
3 terms of the developing work agenda, I don't --  
4 like other work agenda items, you know, develop a  
5 proposal, have a conversation about that,  
6 socialize that with leadership, and then see how  
7 best they want to proceed on that. So, that is  
8 something that I know that has been brought up in  
9 previous conversations. I know, Scott, you and I  
10 spoke about this. So, you know, kind of, look in  
11 terms of how you want to scope this, and then,  
12 for us to socialize it internally.

13 MR. RICE: One more comment on that.  
14 We were looking at not just that fracking issue,  
15 but -- just for clarity, looking at water and  
16 just inputs -- or not inputs per se, but just  
17 beyond water, produced water, et cetera --

18 MS. BEHAR: Oil and gas  
19 infrastructure.

20 MR. RICE: Oil and gas infrastructure.  
21 And just from that couple of sentences, you can  
22 see that's a tough one to scope. But I wanted to

1 encourage on all these fronts, and as we move  
2 through these agendas, that we do have open  
3 docket and appreciate the input.

4 CHAIRMAN CHAPMAN: Steve.

5 MR. ELA: And I'd just like to echo  
6 for the Program. I mean, Ohio has presented on  
7 this public comment a number of times. But it's  
8 certainly an issue in Colorado. I mean, North  
9 Dakota we hear about, but Colorado has a huge oil  
10 and gas extraction industry that's all being  
11 fracked now. So, it's not -- I just want to feed  
12 back into, on the public comment that it is not  
13 just a regional thing in Ohio. It is a much  
14 broader topic that, like, our Valley and Organic  
15 Growers Association has come out on the record to  
16 the BLM on or around our Valley to try and  
17 protect our, you know, our water supplies and  
18 things. So, I just want to make sure you realize  
19 it's not isolated.

20 MR. RICE: Thank you for that.

21 MR. MORTENSEN: And the same -- the  
22 same exact thing is true in Pennsylvania and West

1 Virginia, Eastern Ohio. Yes. For sure.

2 MR. RICE: A-Dae.

3 MS. BRIONES: Yes. And I just want to  
4 add to that, where the same issue is relevant in  
5 New Mexico and North Dakota and Virginia.

6 MR. RICE: Keep sneaking up on me.  
7 Emily.

8 MS. OAKLEY: I would be remiss if I  
9 didn't mention Oklahoma. And I know an organic  
10 farmer personally, who has had fracking on her  
11 farm and the impacts that that's had on her.

12 MR. RICE: Harriet.

13 MS. BEHAR: I think, concerning oil  
14 and gas infrastructure, pipelines and such, it's  
15 pretty much every state in the Union.

16 CHAIRMAN CHAPMAN: All right. Okay.  
17 We'll move onto the crops subcommittee work  
18 agenda.

19 Francis. Francis, you're going to --  
20 you're taking lead on all of these. Is that  
21 correct?

22 DR. THICKE: Right. Run out the door.

1       Okay.  So, the crops subcommittee has five  
2       materials that are petitioned that will be on  
3       target, we hope -- or they hope for spring 2018.  
4       Polyoxin D zinc salt, allyl isothiocyanate,  
5       sodium citrate, natamycin, and sulfur as a  
6       molluscicide.  And other things that are being  
7       worked on that may or may not be on the agenda  
8       for next spring are manure treatments, which is  
9       some continuation of work on animal with  
10      biodegradable, biobased mulch, marine materials.  
11      And then the two container and hydroponics  
12      issues, which the subcommittee will have to  
13      wrestle with somehow.  And then the sunsets.  Do  
14      you want me to read you the list of sunsets?

15                   CHAIRMAN CHAPMAN:  Yes.

16                   DR. THICKE:  Okay.  So, for our 2020  
17      sunsets, we have alcohols, ethanol and  
18      isopropanol, sodium carbonate peroxyhydrate,  
19      newspaper or other recycled material, plastic  
20      mulch and covers, aqueous potassium silicate,  
21      elemental sulfur, lime sulfur, sucrose octanoate  
22      esters, hydrated lime, liquid fish products,

1       sulfurous acid, ethylene, microcrystalline  
2       cheesewax, and potassium chloride.

3                     Dan.

4                     DR. SEITZ: I had the impression  
5       yesterday that people on both sides of the  
6       hydroponics issue had some interest potentially,  
7       in looking into the idea of a label that would  
8       indicate hydroponics. So, I'm curious, if we  
9       were to explore that as a work agenda item, how  
10      that -- I'm sorry. I am not talking into the mic  
11      consistently here. So, I want to -- just want to  
12      ask how it -- that might be considered as a work  
13      agenda item.

14                    DR. TUCKER: Yes. I think I would  
15      sort of repeat what I shared this morning, in  
16      that we'll go back and sort of take the events of  
17      this meeting back to our leadership team, get  
18      their feedback, and then share their thoughts  
19      with the board.

20                    MS. BEHAR: So, if we were to explore  
21      a label, my confusion is, what committee does it  
22      go in? Because we don't typically have labeling

1 in crops, but it's really not handling. So,  
2 that's somewhat my confusion. Because, I might  
3 be willing to put together a work agenda request,  
4 but I'd have to figure out what committee I have  
5 to go through.

6 CHAIRMAN CHAPMAN: Well, if it wasn't  
7 your committee, it would most likely be CA -- or,  
8 sorry, if it wasn't in the crops committee, it  
9 would likely be the CACS committee, which you  
10 also luckily serve on at this time. So, at least  
11 one of those two -- generally the requests start  
12 at a subcommittee, go through the executive to  
13 the -- to the Program. The Program makes a  
14 determination. Or if the Program wants to ask  
15 directly, they just ask and refer it down to us.  
16 But then the chair assigns it out to the  
17 appropriate subcommittee. I -- whoever the  
18 future chair is -- and I hear your -- as current  
19 chair, I hear your concerns, but I think that get  
20 resolved if and when some proposal goes forward,  
21 and depending on what originates it, if it's us  
22 or the Program.

1 DR. TUCKER: Yes. I would say, if you  
2 could let us get some feedback on this, I think  
3 that would be a logical next step.

4 MR. BRADMAN: I just want to echo what  
5 Harriet said. I think this would be a good  
6 agenda item for the board.

7 CHAIRMAN CHAPMAN: All right. Thank  
8 you, Francis. I just made you go through all the  
9 sunsets, just because I wanted more than, let's  
10 do it, to be your last words here on the board.

11 DR. THICKE: Not quite last.

12 CHAIRMAN CHAPMAN: I know.

13 So, up next is handling. We also  
14 wanted to make Lisa pronounce all these things.

15 MS. DE LIMA: I've got two more years.

16 (Laughter.)

17 MS. DE LIMA: All right. Well, we'll  
18 start with petitions. SDBS. So, first petition.

19 (Laughter.)

20 CHAIRMAN CHAPMAN: Can you read it out  
21 in its entirety?

22 MS. DE LIMA: Maybe. Sodium

1 dodecylbenzene sulfonate. And we've got sodium  
2 chlorite for the generation of chlorine dioxide  
3 gas, silver dihydrogen citrate, the two pepper  
4 petitions, which we are still going -- we're  
5 coming forward with them, but we are still going  
6 back and forth with the petitioner -- getting  
7 some information out of them -- and then tamarind  
8 seed gum.

9 Other projects we're working on, BPA,  
10 which Asa's taking the lead on. We'll continue  
11 working on marine materials, and then a re-  
12 classification of magnesium chloride.

13 And then we have 18 sunset materials.  
14 Are you going to make me read those?

15 Calcium carbonate, flavors, gellan  
16 gum, oxygen, potassium chloride, alginates,  
17 calcium hydroxide, epolene, glycerides, mono and  
18 di, magnesium stearate, phosphoric acid,  
19 potassium carbonate, sulfur dioxide, xanthan gum.  
20 I'm not going to say that one. FOS.

21 CHAIRMAN CHAPMAN:

22 Fructooligosaccharides.

1 MS. DE LIMA: That. What Tom said.  
2 Gums, Arabic, Carob bean, Guar, and Locust bean,  
3 lecithin de-oiled, and tragacanth gum.

4 CHAIRMAN CHAPMAN: Any questions for  
5 Lisa?

6 Yes. Harriet?

7 MS. BEHAR: Is this the flavors that  
8 we had public comment about, that there was an  
9 annotation that was proposed?

10 CHAIRMAN CHAPMAN: So, we -- the -- we  
11 were petitioned to change the annotation to  
12 flavors. I don't remember when we received the  
13 petition, but we voted on it in the fall of 2015.  
14 And that's what's in the Program right now. At  
15 the same time, we did a sunset review, and it's  
16 also part of the sunset reorganization. But it's  
17 flavors, as currently listed.

18 MS. BEHAR: We're still waiting for  
19 the --

20 CHAIRMAN CHAPMAN: The Program to move  
21 forward.

22 MS. BEHAR: -- the Program to -- Okay.

1                   CHAIRMAN CHAPMAN: Yes. And I don't  
2 know if the Program wants to make a comment on  
3 where the flavors annotation change proposal is  
4 at.

5                   PARTICIPANT: That is not done.

6                   CHAIRMAN CHAPMAN: So, still under  
7 review?

8                   PARTICIPANT: Yes.

9                   CHAIRMAN CHAPMAN: Okay. Steve.

10                  MR. ELA: And I, for Lisa, I lose  
11 track, but you've put a -- several other new  
12 petitions in front of the handling committee,  
13 haven't you? Or am I -- I've seen a few things  
14 come through my email that I haven't quite  
15 internalized. Am I just? Or was it crops?  
16 Okay. Sorry. I haven't been paying real close  
17 attention to that. I have to admit. So, sorry.

18                  CHAIRMAN CHAPMAN: Yes. That's for  
19 the next semester. All right. We'll move on to  
20 livestock.

21                  Ashley.

22                  MS. SWAFFAR: Okay. In livestock we

1 have a few petitions. The first is thymol.  
2 We're still kind of going back and forth on that  
3 one. Glycolic acid as a teat dip, and then we  
4 just received oxalic acid for beekeeping last  
5 week. So, we'll probably be bringing that one  
6 forward.

7 Our 2020 sunsets are alcohols,  
8 ethanol, and isopropanol, aspirin, vaccines,  
9 electrolytes, glycerine, phosphoric acid,  
10 hydrated lime, mineral oil, and sucrose octanoate  
11 esters. And that's all we have for now. So --  
12 any questions?

13 CHAIRMAN CHAPMAN: Questions for  
14 Ashley?

15 All right. Up next is materials and  
16 GMO subcommittee.

17 MS. BEHAR: So, we will be working on  
18 the non-GMO organic seed integrity, contamination  
19 issues of farm inputs is still on our agenda, as  
20 well as the continued work on the living document  
21 of excluded methods terminology.

22 CHAIRMAN CHAPMAN: Questions?

1 All right. Thank you. And --

2 MS. BEHAR: And maybe sanitizers.

3 CHAIRMAN CHAPMAN: And up next is  
4 policy development with Dan.

5 DR. SEITZ: So, there are no major  
6 revisions that are needed. There may be a couple  
7 small tweaks to just make the manual consistent  
8 with how a procedure here or there may have  
9 evolved.

10 CHAIRMAN CHAPMAN: Thank you, Dan.  
11 Questions for Dan?

12 All right. I think that's it. Okay.  
13 So, up next, we have a presentation of  
14 certificate of appreciation. I also have a  
15 motion here I forgot to read off. But it's a  
16 motion to sunset Francis Thicke.

17 (Laughter.)

18 CHAIRMAN CHAPMAN: I think it takes a  
19 two-thirds vote from the board --

20 MS. BEHAR: I --

21 CHAIRMAN CHAPMAN: -- to allow this to  
22 occur. They remain on the list unless voted off.

1 MS. BEHAR: I speak against that  
2 motion.

3 MR. RICE: So, deferred sunset, or  
4 would we have him until March of 2022?

5 CHAIRMAN CHAPMAN: So, generally, we -  
6 - there's a presentation of a plaque. And we  
7 open it up to the Program to do that, and then we  
8 give Francis an opportunity to say a few words if  
9 you'd like.

10 So, Jenny.

11 DR. TUCKER: Thanks. I've got to move  
12 over and sit next to Francis for this  
13 presentation. We do have a plaque for Francis.  
14 It says, certificate of appreciation, presented  
15 to Dr. Francis Thicke for five years of dedicated  
16 service as a member of the USDA's national  
17 organic standards board, 2013-2018. And I just  
18 want to say that since I've been working with  
19 Francis and hearing about his impact on the  
20 board, it really is phenomenal, the insights,  
21 experience, and expertise that this group has  
22 come to rely on him so much for. And I know that

1 that will be dearly missed by this group and by  
2 the Program. Your depth of knowledge, of  
3 thoughtfulness, of commitment.

4 Francis and I share one -- well,  
5 probably a lot of things in common, but one thing  
6 I particularly value in this moment is Francis is  
7 a trumpet player, and I am a trumpet player. So,  
8 we have part of the brass section covered. And  
9 it reminds me that often in music -- I'm a big  
10 fan of music metaphors. And we often have  
11 dissonant chords. Right? And often we don't  
12 know how a chord is quite going to resolve, but  
13 sometimes the most discordant and unresolved  
14 music can end up resulting in the most beautiful  
15 harmonies ever. And I think that that can be a  
16 good metaphor for our community and orchestra  
17 here today.

18 So, Francis, thank you for your gifts,  
19 for your commitment, and your total devotion to  
20 this community.

21 DR. THICKE: Thank you, Jenny.  
22 Appreciate it.

1 (Applause.)

2 DR. THICKE: Well, I hope it isn't too  
3 discordant what I might say here, but I hope you  
4 can take it in the spirit of what I'm giving it  
5 in.

6 First of all, I want to thank all the  
7 board members for all your hard work, and all the  
8 staff. I really appreciate it. And we really  
9 appreciate Michelle. She's the glue that holds  
10 it all together. And whatever you're paying her,  
11 it's not enough.

12 So, there are two important things I  
13 learned being on the board for five years.  
14 First, I learned that the NOSB review process for  
15 materials petition, is really quite rigorous.  
16 Technical reviews and careful scrutiny by the  
17 subcommittees and by the full board.

18 The second thing I've learned over  
19 time is that the industry has an outsized and  
20 growing influence on USDA and on the NOSB,  
21 including through NOSB appointments, compared to  
22 the influence of organic farmers, who started

1 this organic farming movement.

2           Perhaps that is not surprising, given  
3 the growing value of organic sales. As organic  
4 is becoming a 50-billion-dollar business, the  
5 industry not only wants a bigger piece of the  
6 pie, sometimes it seems they want the whole pie.  
7 Now, we have organic chicken CAFOs with 200,000  
8 birds crammed into a building with no real access  
9 to the outdoors, and a chicken industry working  
10 behind the scenes to make sure that the animal  
11 welfare standards, weak as they were, never make  
12 it to see the light of day, just like the  
13 chickens. The image consumers today of organic  
14 chickens ranging outside has been relegated to  
15 pictures on egg cartons. We have CAFO dairies  
16 with 15,000 cows with compelling evidence by  
17 investigative reporter that the CAFO was not  
18 meeting the grazing rule, not by a long shot.

19           But when USDA did its obligatory  
20 investigation, instead of a surprise visit, they  
21 got a heads up, so that they could move the cows  
22 to the feed lots, to pasture, on the day of

1 inspection, which gives a green lot to that dairy  
2 CAFO to move forward with his plans to establish  
3 a 30,000-cow facility in the Midwest.

4 We have large grain shipments coming  
5 into the US that are being sold as organic, but  
6 lack organic documentation. Some shipments have  
7 been proven to be fraudulent. The USDA has been  
8 a bit slow to take action to stop this. The  
9 organic crop farmers in the US are suffering  
10 financially a great deal as a result. And I  
11 spoke with the reporter who broke the story on  
12 the fraudulent organic grain imports. When I ask  
13 him how he's able to document that fraud, when  
14 USDA said it was very difficult, he said it was  
15 easy.

16 We have a rapidly growing percentage  
17 of the organic fruits and vegetables on grocery-  
18 store shelves being produced hydroponically,  
19 without soil, and mostly in huge, industrial-  
20 scale facilities. And we have a hydroponics  
21 industry that has deceptively renamed hydroponic  
22 production, even with 100 percent liquid feeding,

1 as container production. With their clever  
2 deception, they have been able to bamboozle even  
3 the majority of NOSB members into complicity with  
4 their goal of taking over the organic fruit and  
5 vegetable market with their hydroponic products.

6 Perhaps we shouldn't be surprised to  
7 find that big business has taken over the USDA  
8 organic Program, because the influence of money  
9 is corroding all levels of our government. At  
10 this point, I really can't see any -- I can only  
11 see one way to bring the organic label back in  
12 line with the original vision of organic farmers  
13 and consumers.

14 I think we need an add-on organic  
15 label for organic farmers who are willing to meet  
16 the expectations of discerning consumers who are  
17 demanding real organic food. A year ago, I  
18 wouldn't have supported that idea of an add-on  
19 organic label, because I, like many others, saw  
20 the USDA organic label as the gold standard and  
21 had hoped that through our vision of the process  
22 of continuous improvement, we could really make

1 it to be that gold standard.

2 Now, I see that the influence of big  
3 business is not going to let that happen. The US  
4 is increasingly exerting -- the USDA is  
5 increasingly exerting control over the NOSB, and  
6 big business is tightening its grip on the USDA  
7 and on Congress. Recently, the industry  
8 representatives called publicly on the US Senate  
9 to weaken the NOSB and give industry a stronger  
10 role in the National Organic Program. And  
11 sympathetic centers promised to do just that.

12 Now, I support the establishment of an  
13 add-on organic label that will enable real  
14 organic farmers of discerning organic consumers  
15 to support on another through a label that  
16 represents real organic food. I support the  
17 creation of a label such as the proposed  
18 regenerative organic certification that will  
19 ensure organic integrity, for example, that  
20 animals have real access to the outdoors and to  
21 be able to express their natural behaviors, and  
22 that food is grown in soil. My hopes are that

1 this add-on certification can be seamlessly  
2 integrated with the NOP certification, so that a  
3 single-farm organic system plan and inspection  
4 can serve to verify both NOP and the higher level  
5 organic certification by certifiers that are  
6 credited at both certification systems.

7 I'm also pleased that the organic  
8 farmers have recently organized themselves into  
9 the Organic Farmers Association, to better  
10 represent themselves in the arena of public  
11 policy. Too often in the past, the interests of  
12 big business have overruled the interests of  
13 organic farmers and consumers when organic  
14 policies are being established in Washington.

15 I hope this new organization will  
16 allow organic farmers to gain equal footing with  
17 industry on issues that affect the organic  
18 community.

19 So, in summary, organic is at a  
20 crossroad. We can either continue to allow the  
21 industry to -- their interests to bend and delude  
22 the organic rules to their benefit, or for

1 organic farmers, working with the organic  
2 consumers, you can step up and take action to  
3 ensure organic integrity in the future.

4 Thank you.

5 CHAIRMAN CHAPMAN: Thank you, Francis.

6 Any board members want to say any last words to  
7 Francis?

8 Harriet.

9 MS. BEHAR: I'll be seeing you,  
10 Francis.

11 MS. SWAFFAR: So, Francis, you've been  
12 my vice chair in livestock, and you've been such  
13 a valuable member to our committee. I will miss  
14 you so much and your knowledge of the dairy  
15 industry. And you know, we'll really have hole  
16 in our committee for quite some time, but I just  
17 want to remind you, your term does not end until  
18 January. So, we still have a lot of meetings  
19 left. But thank you so much for your service.

20 DR. THICKE: Thank you, Ashley.

21 CHAIRMAN CHAPMAN: Emily.

22 MS. OAKLEY: When I first got

1 appointed to this position, we were asked to  
2 subcommittee calls, and I did. And I was also  
3 told that we would probably have mentors if we  
4 wanted them. And I listened to all the people  
5 speaking, and I just always gravitated towards  
6 Francis, as I think many of us do, for the kind  
7 and thoughtful way that he speaks. Even when he  
8 says things that are contentious, it always comes  
9 out sounding nice. And I just had an affinity  
10 for everything that he said.

11 So, I just wanted to thank Francis for  
12 being my mentor. And even though it's my second  
13 year, I still feel like you're mentor, and you  
14 will be even when you're gone. I'll still ask  
15 you questions and how to pronounce things. But,  
16 thank you.

17 You bring your perspective as a  
18 farmer, as a soil scientist, as a former USDA  
19 employee, and as a consumer, to this role that I  
20 don't think anybody else can bring to this table.  
21 And you will be sorely missed. Thank you.

22 CHAIRMAN CHAPMAN: Michelle.

1 MS. ARSENAULT: Yes. So, I just  
2 wanted to say thank you to Francis. Francis and  
3 I share a birthday, and I've gotten a couple of  
4 trumpet serenades over the years. So, thank you,  
5 Francis. But I will hold a grudge that you've  
6 been on this board for five years, and as a dairy  
7 farmer you make ice cream, and I have not gotten  
8 any ice cream yet. So --

9 CHAIRMAN CHAPMAN: Well, you still  
10 have until January 23rd.

11 Steve.

12 MR. ELA: Francis, this is the, I  
13 think, the second board I've served on with you.  
14 And even though there's a small overlap, I just  
15 want to say, I appreciate your free thinking and  
16 your public comments, your ability to analyze  
17 issues and bring out, you know, the real gist of  
18 it. And I know you're not going to disappear,  
19 and I am looking forward to your continued  
20 involvement in all things organic and moving all  
21 everything forward. Thank you, so much.

22 MR. MORTENSEN: I would like to echo

1 what Emily said about the mentorship. Francis, I  
2 -- probably ten times we talked on the phone  
3 about things that I was just unclear on, or --  
4 two times Francis called from his tractor with  
5 questions about cover crops that we discussed  
6 while I was in cover crop fields in Pennsylvania.  
7 But we will definitely miss you, and we will  
8 clearly miss your leadership in seeing a holistic  
9 system and articulating it in such a beautiful  
10 way that you do.

11 Thank you, Francis.

12 MR. BRADMAN: Yes. I just want to  
13 thank you too for your presence. I mean, I  
14 really feel like you're a gentleman in the real  
15 meaning of the word. You know, I've only been  
16 now to two meetings, and I've been on the phone  
17 calls, and I really feel like there's been fair  
18 discussion. And I just really appreciate that.  
19 And it's kind of a role model for my role here.  
20 So, thank you.

21 CHAIRMAN CHAPMAN: Have we -- have we  
22 made you blush, Francis?

1 (Laughter.)

2 CHAIRMAN CHAPMAN: All right.

3 Francis, thank you very much.

4 Okay. Up next, we have officer  
5 elections. Michelle, can you pull up? Yikes.

6 All right. Hold on.

7 All right. So, briefly I want to  
8 review the election procedures from our policy  
9 and procedures manual. So, we do officer  
10 elections every fall for all positions. There's  
11 three officer positions, chair, vice chair, and  
12 secretary.

13 And I'll briefly run through the  
14 process. So, first it starts with nominations.  
15 And any NOSB members eligible for consideration  
16 for any officer position. The second one is that  
17 any NOSB member may self-nominate or be nominated  
18 by another member of the NOSB. The third one  
19 isn't really relevant here, but it's basically  
20 saying no quitters. Once you're in, you're in.  
21 The fourth one states that members may serve more  
22 than one term in any officer position.

1           The voting schedule. So, officers  
2           should be elected to one-year terms by a majority  
3           vote in the fall at the NOSB meeting. Newly  
4           elected officers will assume their positions at  
5           the conclusion of the fall NOSB meeting and  
6           assume the responsibilities thereof at that time.  
7           Outgoing NOSB officers will assist incoming  
8           officers with their transition to their new  
9           roles, to be completed no more than the 23rd of  
10          January of the following year.

11           So, counting of the votes. Votes are  
12          done by secret ballot. Jesse and Ashley just  
13          passed them out. So, we have a green, a yellow,  
14          and a red. I'll use the green for chair, the  
15          yellow for vice chair, and then the secretary.  
16          The ballots are cast, and we do elections in that  
17          order. So, we start with the chair, move on to  
18          the vice chair, and finish with the secretary.

19                    Yes?

20           MS. OAKLEY: Could you repeat those  
21          colors?

22           CHAIRMAN CHAPMAN: We'll start --

1 we'll do it when we -- as we go through, just to  
2 make it clear. But, green -- green for chair.  
3 Yellow for vice chair. Pink for secretary.

4 Ballots will be counted for one office  
5 at a time. The secretary will announce the tally  
6 before the next office is open for nominations.  
7 The secretary and the vice chair will prepare and  
8 distribute the ballots and then collect them  
9 after each vote. One thing to note here. If one  
10 of those officers are running for election --  
11 it's not specified here, but it's probably  
12 prudent that they don't collect the ballots. So,  
13 we'll either choose another officer, or perhaps  
14 an outgoing member.

15 The secretary will tally votes with  
16 the chair, and the chair will verify the results.  
17 Again, if one of those officers are running for  
18 election, we'll use another officer or an  
19 outgoing member as necessary.

20 The first nominee to receive a  
21 majority of votes will be elected. If no nominee  
22 receives the majority of votes, the nominee with

1 the least number of votes, assuming there's more  
2 than two, will be eliminated, and a revote will  
3 occur with the remaining candidates. This  
4 process will be repeated until a nominee obtains  
5 a majority. In the event of a tie, there will be  
6 a revote until the nominee obtains a majority.  
7 And all nominees will be included in the revote.

8 So, we do vote by majority. So,  
9 plurality requires a revote, if that makes sense  
10 to folks.

11 Votes will remain confidential, and  
12 ballots will be disposed of by the chair or  
13 secretary. And a nominee may withdraw at their  
14 discretion at any time. In the event of only one  
15 nominee for office, the vote may be done by  
16 acclamation.

17 So, at this time, we'll open it up for  
18 nominations for the first position, which is  
19 chair.

20 Francis.

21 DR. THICKE: I nominate Harriet Behar.

22 CHAIRMAN CHAPMAN: Lisa.

1 MS. DE LIMA: I nominate Tom Chapman.

2 CHAIRMAN CHAPMAN: Emily.

3 MS. OAKLEY: Can I second both?

4 CHAIRMAN CHAPMAN: Yes. There's no  
5 need to second, but yes. Perfect.

6 MS. OAKLEY: All right. Got it.

7 CHAIRMAN CHAPMAN: Okay. If people  
8 are comfortable or uncomfortable with me running  
9 because I was nominated, I'll pull it over to  
10 Ashley, but Ashley can -- I mean, we just -- we  
11 all have ballots.

12 MS. SWAFFAR: Okay. So, we're going  
13 to use the green ballots. Please write on them  
14 either Harriet's name or Tom's name, fold them in  
15 half, and Jesse and I will be around to pick them  
16 up.

17 (Voting.)

18 CHAIRMAN CHAPMAN: Francis, you got  
19 that trumpet?

20 MS. BEHAR: Can it be a requirement  
21 that Francis' replacement play a musical  
22 instrument.

1                   CHAIRMAN CHAPMAN: Yes. That seems  
2 like a good idea. We should let the secretary  
3 know to add that to the criteria.

4                   MR. MORTENSEN: Harriet, you don't  
5 know this about me, but I play the accordion.

6                   CHAIRMAN CHAPMAN: Did you bring it  
7 with you?

8                   MS. BEHAR: Along with wine and tofu,  
9 I like the accordion.

10                  PARTICIPANT: We could have played

11                  MR. MORTENSEN: I almost brought it  
12 with me.

13                  CHAIRMAN CHAPMAN: I'm not sure how  
14 the public would feel about that. This is going  
15 to make for some really good transcripts.

16                  MS. SWAFFAR: Okay. We have tallied  
17 the votes, and Tom, you will be our chair again  
18 next year.

19                  CHAIRMAN CHAPMAN: Okay. The next  
20 officer up for election is vice chair. Any  
21 nominations for vice chair?

22                  Emily?

1 MS. OAKLEY: Harriet.

2 CHAIRMAN CHAPMAN: All right.

3 MR. BUIE: I'd like to nominate  
4 Ashley.

5 CHAIRMAN CHAPMAN: Okay. I have a  
6 nomination for Harriet and a nomination for  
7 Ashley.

8 MR. BRADMAN: Can I ask a question?

9 CHAIRMAN CHAPMAN: Yes.

10 MR. BRADMAN: What does the vice chair  
11 do?

12 CHAIRMAN CHAPMAN: Hoo, hoo. Seems  
13 like a kind of an esoteric question or one of the  
14 ones you can't really answer. You want me to  
15 pull out my -- give me a second. This seems like  
16 an excellent time to be able to refer back to the  
17 --

18 MR. BRADMAN: Give me the short  
19 version.

20 CHAIRMAN CHAPMAN: -- the policies and  
21 procedures.

22 PARTICIPANT: So, there's a

1 definition, correct?

2 CHAIRMAN CHAPMAN: There is a  
3 definition. Just give me a half a second here.

4 MR. BRADMAN: I assume in the absence  
5 of the chair they act as chair, but is there  
6 anything else?

7 CHAIRMAN CHAPMAN: All right. The  
8 vice chair acts in the absence of the chair. The  
9 primary duties of the vice chair are as follows,  
10 serves as a member of the executive subcommittee,  
11 participates in the administrative team meetings,  
12 serves a member of the policy development  
13 subcommittee, and helps maintain the policies and  
14 procedures manual and ensure its accuracy.

15 Any other nominations? Okay. Seeing  
16 none, we'll use the yellow card. And, similarly,  
17 please write down a name, either Ashley or  
18 Harriet. Fold it in half, and Jesse and I will  
19 collect them.

20 (Voting.)

21 CHAIRMAN CHAPMAN: The vice chair will  
22 be Harriet. Congratulations.

1           Up next is secretary. And since we  
2 had the question, I am going to read and have it  
3 before me. The primary of the secretary are as  
4 follows, serves a member of the executive  
5 subcommittee, participates in administrative team  
6 meetings, records all NOSB votes at NOSB meetings  
7 in collaboration with the advisory committee  
8 specialist, and circulates that record to the  
9 NOSB members for approval, assists with annual  
10 elections of NOSB officers, and may delegates  
11 tasks to others but retains responsibility for  
12 the official record. In addition to this, we've  
13 had the secretary also monitoring the open docket  
14 and providing updates to the board. It's not  
15 officially in the job description, but that's  
16 been a task as assigned from the chair.

17           Any nominations for secretary?

18           Harriet?

19           MS. BEHAR: I don't know. Jesse just  
20 gave me a side-wise glance. I'm not sure I was  
21 going to nominate Jesse. Do -- would you like to  
22 continue serving?

1 MR. BUIE: Not really. No. I'm not.

2 MS. BEHAR: Well, then, I'll nominate  
3 Dan Seitz.

4 DR. SEITZ: You know, I'll pass for  
5 the time being. But thank --

6 CHAIRMAN CHAPMAN: Joelle?

7 MS. MOSSO: I'll nominate Scott.

8 CHAIRMAN CHAPMAN: Scott, you going to  
9 pass too, or you --

10 MR. RICE: I'll accept. Thank you.  
11 Was it the duties as assigned by the chair that's  
12 scaring everyone here?

13 MR. RICE: I think that qualifies.

14 CHAIRMAN CHAPMAN: Any other  
15 nominations? Yes, A-Dae?

16 MS. BRIONES: I would like to nominate  
17 Ashley.

18 MS. SWAFFAR: No, thank you. I think  
19 Scott will be a fabulous secretary.

20 CHAIRMAN CHAPMAN: Okay. We only have  
21 one nominee. So, we can save our pink pieces of  
22 paper, and we'll take the vote by acclamation.

1 All in favor of Scott, say aye.

2 (Chorus of aye.)

3 CHAIRMAN CHAPMAN: Scott. Okay. So,  
4 we have our new officers for next year. And with  
5 that, we'll move on to -- Yes. Thank you. With  
6 that, we'll move onto other business and closing  
7 remarks. I don't -- I'm unaware of other  
8 business before the board. Closing remarks, I'd  
9 like to ask the Program if they have any closing  
10 remarks to make.

11 DR. TUCKER: Thank you very much. I'm  
12 going to actually first turn it to Paul here.

13 DR. LEWIS: Thank you, Jenny. I want  
14 to make a few remarks. I want to first thank the  
15 board for all your work, appearing for  
16 deliberations, and this week's work. I know it  
17 was a lot of public comments, and we appreciate  
18 all the effort in terms of balancing your  
19 professional responsibilities and also your work  
20 here. Also want to thank the public. So, the  
21 public plays a valuable role in terms of  
22 providing information to the board, but also to

1 us, the Program, in terms of helping us in terms  
2 of decisions that we make, any other work that's  
3 important for us with National Organic Programs.  
4 So, we appreciate the valuable comments that you  
5 make, both via the web -- our two public comment  
6 webinars we just had recently, and the public  
7 comment process that we had today.

8           Finally, also, I want to thank  
9 Francis. I didn't make any remarks when people  
10 were going around, because I wanted to save the  
11 time here. Really enjoyed working with you,  
12 Francis -- working with you, learning with you,  
13 the conversations that we had. It was really a  
14 valuable and rewarding experience. I just want  
15 to thank you for serving on the board these  
16 years. And for my two years here, it was really  
17 a very rewarding experience. So, thank you for  
18 that.

19           Also, the new leadership, or  
20 continuing leadership, certain parts, for the  
21 National Organic Standards Board, for Tom,  
22 Harriet, and Scott. I'm looking forward to

1 working with you over the next year.

2 But I would be remiss in terms of not  
3 thanking my NOP colleagues, to Doctor Tucker,  
4 Michelle, Lisa, and Devon. The work that they do  
5 behind the scenes to get us to this place today  
6 and during the course of the week, is phenomenal.  
7 So, I just want to thank them for the work that  
8 they do and just for being a great team. So,  
9 thank you.

10 As Dr. Tucker's DFO, I turn the  
11 meeting to you.

12 DR. TUCKER: Okay. And I would love  
13 it if all of us would give Tom Chapman a huge  
14 hand for doing such a wonderful job with this  
15 meeting. So, Tom, thank you.

16 And, again, thanks to all of you who  
17 invested your time and energy in being here  
18 during this meeting. Thank you for being here.  
19 And I think the meeting is officially --

20 CHAIRMAN CHAPMAN: Quick comments, if  
21 you will let me. So, thank you to the public for  
22 your participation in our meeting. Thank you to

1 the board members, again, for your time and  
2 dedication. Thank you to our audio support, and  
3 transcriptionist. Thank you to the Program. And  
4 I think, especially, we would be remiss if we  
5 didn't specifically call out Michelle and thank  
6 you for all her hard work to make this seamless.

7 Another flawless meeting with great  
8 execution. So, thank you, Michelle. Always  
9 appreciated.

10 Oh, yes. And thanks to our outgoing  
11 officers as well, for their time and service  
12 during this last year. They've been a great help  
13 and support. And welcome to the oncoming  
14 officers as well.

15 With that, we'll close the meeting.

16 DR. TUCKER: We are adjourned. Thank  
17 you very, very much.

18 (Whereupon, the above-entitled matter  
19 went off the record at 3:58 p.m.)  
20  
21  
22

## A

**A-** 55:5**A-dae** 1:14 118:22

125:1 126:4 133:14

135:4 153:12 203:8

206:10 209:22 242:10

279:6 295:2 326:15

**a.m** 1:9 5:2 83:18 84:6

123:21,22

**ability** 79:22 315:16**able** 27:15,21 37:16

59:17 179:15 241:15

250:15 253:14 260:4

309:13 310:2 311:21

323:16

**above-entitled** 123:20

228:19 330:18

**absence** 324:4,8**absent** 101:15 110:13

115:8 148:18 150:19

153:4 219:14

**absolutely** 86:1 116:4

120:22 184:12 196:16

239:9

**absorb** 148:7**abstain** 135:9,16

219:13

**abstentions** 96:3

110:13 135:21

**abstract** 78:5**abuse** 93:9**ACA** 74:3**academic** 230:20**Academy** 236:12,17**accelerate** 233:16**accept** 47:14 55:6

168:1 218:20 286:1

326:10

**acceptable** 115:13

180:4 277:6

**accepted** 260:20**access** 133:6 193:20

308:8 311:20

**accidentally** 118:10

270:3

**acclamation** 320:16

326:22

**accordion** 322:5,9**account** 59:19 72:13

73:19,20 143:8

**accounting** 59:17**Accreditation** 22:16**Accredited** 42:22**accumulate** 138:11

228:3

**accumulating** 227:2**accumulation** 105:19**accuracy** 324:14**accurate** 248:9**acid** 3:12,20 4:3 136:2,4

136:6 139:1 140:2

158:11 176:10,14,18

177:9 178:19 189:14

217:10 218:16 297:1

300:18 303:3,4,9

**acidified** 3:18 158:4,8

158:10,17 159:21

**acidity** 156:13**acids** 212:17**acknowledge** 74:15**acquired** 165:10**acre** 33:11 34:11**acres** 33:14 52:21**act** 23:10,14 43:7 88:8

98:14 122:3 163:1

209:16 324:5

**acting** 290:3**action** 69:4,6,8,14,17

71:7 81:4 102:3,4,7

109:17 113:17 224:11

260:2 309:8 313:2

**actions** 65:6 67:16 69:5

69:9 70:19 71:3 72:18

73:5 82:2,7

**active** 85:16**activities** 68:16**activity** 51:15 64:18

173:18

**actor** 71:13**actors** 71:9,11,16 81:12

81:14,15

**acts** 324:8**actual** 63:13 180:17

264:4

**actuality** 181:7**acute** 72:22 73:12

74:15

**add** 11:22 16:2 19:16

20:21,21 29:2 34:12

40:12 45:2 52:15

68:19 79:16 82:21

135:2 140:1,4 166:12

179:18 198:15 203:2

212:13 213:16 221:7

223:16 234:11 244:9

245:10 269:15 276:21

282:18 286:4 292:2

292:15 295:4 322:3

**add-on** 310:14,18

311:13 312:1

**added** 67:18 189:4

224:11 229:10,17,20

259:11 268:19 283:9

**adding** 24:16 28:16

80:5 137:17 243:8,13

292:20

**addition** 29:2 49:14

57:6 78:15 124:14

136:6,11 166:20

224:8 274:18 325:12

**additional** 4:5 40:3

49:16 136:15 189:16

191:4,6 224:4 243:8

247:8 273:21 276:6

**additive** 179:16**address** 8:4 25:13 26:9

40:5,17 43:4 44:9

54:16 76:16,17 77:7

127:8 185:20 223:19

250:15 261:5 277:2

281:7,8

**addressed** 44:2 49:14

95:15 197:1 273:3

**addresses** 256:4**addressing** 74:6 76:18

145:5

**adds** 29:4**adhere** 20:9**Adjourn** 4:20**adjourned** 330:16**adjust** 43:20**adjuster** 156:20**adjusting** 67:11**adjustment** 44:10**adjustments** 66:20

270:20

**administering** 100:10

100:13 109:11,13

113:10,12

**administration** 78:21

100:3 278:18,19

**administrative** 324:11

325:5

**administrator** 2:19

290:3

**administrator's** 66:6,10**admit** 302:17**adopt** 242:8 245:21

246:3

**adopted** 243:6 250:7**adsorb** 148:7**adsorptive** 148:6**adulterated** 73:10**advances** 262:10**advantage** 44:20**advantageous** 249:19**advise** 64:7**advisory** 2:10 152:11

154:14 199:21 325:7

**advocate** 183:19 214:2**aeroponics** 5:21 6:4**affect** 129:9 312:17**affidavit** 76:7**affidavits** 76:2**affinity** 314:9**ag** 36:1 54:6 231:8**agencies** 32:6 85:11**Agency** 56:12 65:20**agenda** 4:12 5:9 22:21

39:17 50:4 51:8 56:2

83:15 84:2,18 124:5

166:13 168:6 173:14

189:3 196:7 224:3

226:8,17 229:3 243:8

261:1 278:20 291:11

291:12 292:3,21

293:3,4 295:18 296:7

297:9,13 298:3 299:6

303:19

**agendas** 291:16,18

294:2

**agent** 156:12,13 161:7

202:11 211:9 212:18

**agents** 41:13 85:4

225:5 227:16

**ago** 30:3 36:2 52:20

60:10,12 141:9

154:19 214:9 239:20

310:17

**agree** 10:16 14:21

25:20 27:6 32:1 36:20

49:17 68:11 70:17

97:2 111:3 128:21

129:13 138:15 166:15

183:4 184:11 192:16

195:12 196:15 249:17

269:3 272:20 274:6

**agreed** 228:2**agreement** 6:5 13:4

278:2

**agricultural** 5:17

191:11 194:8 208:6

217:16,22 218:17

224:17,21 225:4

239:5

**agriculture** 1:1 23:21

199:12 200:13 212:5

231:6 232:10 247:17

**agroinfiltration** 244:10

255:9

**ahead** 8:10 45:20 72:5

258:17 260:14,22

266:13 280:20 291:15

291:15

**aid** 148:1 152:10,20

158:19 161:8

**aids** 152:16**air** 164:22**alcohol** 184:5**alcohols** 296:17 303:7**algae** 221:1 222:13,15

234:3

- alginates** 300:16  
**aligned** 52:7  
**allergens** 73:9  
**alleyways** 17:22  
**Alliance** 24:7 28:21  
**allow** 97:8 98:6 126:2  
 138:10 181:1 187:15  
 304:21 312:16,20  
**allowed** 6:9 10:21 11:15  
 18:18 37:20 84:16  
 85:2,3 95:9 125:4  
 132:21 147:18,18  
 150:2 152:9 154:13  
 156:7 158:7 161:1  
 162:18 168:10 174:6  
 176:13 178:11 186:10  
 191:12 213:20 225:4  
 258:4  
**allowing** 20:16,16  
 137:20  
**allyl** 296:4  
**aloe** 139:12,13  
**alternative** 85:4 127:16  
 127:22 180:19,20  
 202:9  
**alternatives** 86:3 88:20  
 98:4 105:5 106:18  
 107:11,17 127:14  
 129:15 131:12 170:12  
 170:22 180:3 181:5  
 181:14 202:20 235:4  
 235:4,7  
**altogether** 114:5  
**ambiguity** 267:5  
**AMDUCA** 100:1 111:15  
**amenable** 137:17  
**amend** 46:3  
**amended** 55:2  
**amendment** 45:10  
 47:10,14 125:7  
 286:18  
**America** 131:10  
**American** 187:6,10  
 188:1  
**amidated** 214:13,17,22  
**Amish** 107:22  
**amount** 76:5 171:4  
 193:12 206:13 258:14  
 280:5  
**amounts** 212:11  
**amphibians** 37:13  
**AMS** 65:18 240:3  
**analgesia** 100:8  
**analysis** 59:15 126:16  
 184:3  
**analyze** 315:16  
**ancillary** 4:6 156:14  
 212:14 226:5,7,13,22  
 227:4,22 228:3,7,10  
**and/or** 98:15 122:3  
 197:3  
**anecdote** 52:16,19  
**anesthesia** 109:17  
**anesthetic** 104:1 108:8  
 109:10 113:9,16  
 117:19  
**angle** 35:13  
**animal** 76:8 95:19  
 110:18 117:4 118:4  
 119:16 127:3 128:6  
 132:6 133:11 139:7  
 148:2 296:9 308:10  
**animals** 100:13 109:13  
 109:22 113:12 116:22  
 125:11 126:20 129:9  
 138:8,17 192:21  
 199:5,10 311:20  
**Ann** 24:6 25:18  
**Annie's** 187:8  
**annotated** 178:17  
**annotation** 4:4 18:10  
 18:17,20 19:8,13 20:5  
 20:7,10 21:11 86:9  
 93:3,8 101:6 105:10  
 105:16 110:4 114:1  
 183:7 188:22 189:8  
 191:5,7 212:2 224:3  
 225:13,15 301:9,11  
 302:3  
**annotations** 189:12  
**announce** 319:5  
**annual** 325:9  
**answer** 16:3 57:8,9  
 119:2 195:18 206:14  
 207:18 255:11,20  
 323:14  
**answered** 60:14 115:19  
**answers** 280:12  
**anti-caking** 156:13  
**antibiotic** 114:13 116:5  
 117:12,17 118:1,16  
 119:15 139:5  
**antibiotics** 97:5 114:11  
 114:22 116:12 117:2  
 117:3 119:13 120:11  
 120:20 235:8  
**anticipate** 281:21  
**anticipated** 53:4  
**antimicrobial** 137:2  
 139:13 158:9  
**anybody** 96:22 111:11  
 119:1 128:21 203:20  
 207:1 239:10 283:22  
 284:6 314:20  
**anymore** 22:5  
**anyway** 280:21  
**APHIS** 61:4  
**Apparently** 114:14  
**appeal** 66:3,7  
**appeals** 65:5  
**appear** 184:22 274:16  
**appearing** 327:15  
**appears** 84:20  
**appellant** 66:8  
**Appendix** 273:20 275:3  
 285:20  
**applaud** 232:16  
**Applause** 307:1  
**applicability** 182:13  
**applicable** 41:5 80:22  
 84:22 104:1 122:3  
 167:3  
**application** 29:19 93:4  
 125:12 164:16 187:1  
 194:16  
**applications** 31:2 92:19  
 171:2 183:8,10 187:2  
 188:3 194:9 204:14  
**applied** 128:5 274:19  
**applies** 208:10  
**apply** 223:4  
**applying** 128:14  
**appointed** 314:1  
**appointments** 307:21  
**appreciate** 5:22 19:14  
 21:15 25:16 75:7  
 222:21 249:10 280:14  
 294:3 306:22 307:8,9  
 315:15 316:18 327:17  
 328:4  
**appreciated** 45:4 83:11  
 143:10 144:21 330:9  
**appreciates** 230:12  
 235:12  
**appreciation** 304:14  
 305:14  
**approach** 13:4 73:14  
 220:4 222:1  
**appropriate** 81:3  
 104:19 171:2 183:5  
 234:5 266:10 298:17  
**appropriately** 56:18  
 106:2,2  
**approval** 114:18 169:8  
 325:9  
**approve** 55:2 191:18,20  
 242:11 286:8,9  
**approved** 86:5 107:7  
 169:12 191:19 217:11  
 232:8 245:16  
**aquaponic** 6:6  
**aquaponics** 5:20  
**aquatic** 221:11  
**aqueous** 296:20  
**Arabic** 301:2  
**area** 20:17 26:9 37:18  
 42:21 63:2,15 67:1,10  
 109:19 113:18 186:3  
 246:14 247:15,19  
 261:6 270:17 276:19  
**areas** 7:3 26:6 33:18  
 62:2 88:16 116:18  
 138:9 167:10 180:4  
 194:8 240:4  
**arena** 240:9 247:22  
 256:11 312:10  
**argue** 183:14  
**arguing** 251:9  
**argument** 78:17 184:3  
 184:8 239:6  
**Arkansas** 31:17  
**arrests** 73:5  
**arrived** 290:2  
**ARSENAULT** 2:10  
 315:1  
**articulate** 166:10  
**articulated** 167:19  
**articulating** 316:9  
**artificial** 7:8 8:13 11:4  
 11:17 13:9,12,16  
**Asa** 1:14 89:20 157:7  
 164:4 166:10,16,19  
 167:18,21 186:6  
 191:16 235:18 237:3  
 238:11 240:3 251:5  
 287:4  
**Asa's** 188:21 237:22  
 300:10  
**Ashley** 1:12 31:8 46:11  
 84:8 86:20 89:16  
 98:18 112:10 124:6  
 147:8 149:1 151:7  
 153:9 155:5 157:4  
 158:16 159:22 161:18  
 163:7 169:13 170:2  
 172:11 175:12 177:10  
 177:12 206:9 209:19  
 215:22 218:20 270:21  
 271:15 302:21 303:14  
 313:20 318:12 321:10  
 321:10 323:4,7  
 324:17 326:17  
**Asia-based** 203:13  
**asked** 34:21 60:13,21  
 72:12 168:4 181:4  
 202:13 227:3 236:11  
 314:1  
**asking** 10:18 21:19  
 76:7,13 126:20  
 134:17 164:3 226:22  
 233:8 255:6 291:18  
**aspect** 41:1 223:14

**aspects** 272:11  
**aspirin** 303:8  
**assent** 263:6  
**assess** 78:12 221:19  
**assessment** 37:11  
 236:13  
**asset** 45:3  
**assigned** 325:16  
 326:11  
**assigns** 298:16  
**assist** 318:7  
**assistance** 29:14  
**assists** 325:9  
**Associate** 2:18  
**associated** 164:18,22  
**association** 42:22 43:3  
 94:15,19 164:20  
 197:18 211:17 294:15  
 312:9  
**associations** 194:14  
 211:16,17  
**assume** 280:16 318:4,6  
 324:4  
**assumed** 273:12  
**assuming** 320:1  
**asthma** 165:10  
**asthmagen** 164:19  
**attached** 116:6  
**attapulgit** 3:15 147:14  
 147:22 148:5,21  
**attempted** 224:15,18  
**attended** 64:2  
**attention** 8:5 63:3 218:3  
 237:12,17 238:1  
 256:16 261:22 302:17  
**auctions** 43:11  
**audience** 144:14  
**audio** 330:2  
**audit** 48:19,21 68:9  
 77:14  
**audits** 67:3,9  
**augmented** 234:13  
**authority** 40:2 57:4  
 74:20  
**availability** 120:1  
 141:15 197:15 205:5  
 208:10,18 218:8  
 225:18  
**available** 36:9 65:4 86:5  
 104:14 114:16,22  
 115:12 117:16 120:5  
 120:10,20,22 132:13  
 136:12,16 137:9  
 139:10 163:18 170:11  
 185:12 191:8 192:1  
 193:17 208:14 211:8  
 224:7,14,17  
**avenue** 250:12

**avenues** 188:8  
**avoid** 27:1 132:5  
**aware** 49:18 64:21  
 202:20 208:22 232:15  
 255:19 262:4,11  
 270:10,19 274:4,6  
**awful** 132:8  
**awkward** 102:1  
**aye** 327:1,2

---

**B**


---

**b** 1:8 98:15 103:22  
 109:9 113:8 158:6,7  
 161:1 162:18  
**back** 5:6 6:12,13 10:17  
 11:8 15:5 24:14,20  
 26:15 27:7,20 38:13  
 38:17 40:15 52:21  
 56:6,13 72:11 82:4  
 83:13 93:18 106:3  
 123:9 124:5,6 143:8  
 145:1,14,20 146:1  
 147:4,6 189:20  
 197:18 209:3 215:16  
 216:19 226:10,11  
 227:8 228:14,17  
 229:2 231:22 233:19  
 234:17 237:21 241:16  
 245:15 246:6,21  
 249:17,19 254:15  
 265:11 266:11,15,20  
 267:7,12 268:20  
 269:3 271:1,17  
 272:17 273:18,19  
 274:7 276:9 278:21  
 280:8 282:14,17  
 284:8,14 285:19  
 286:6 292:5,11  
 294:12 297:16,17  
 300:6 303:2 310:11  
 323:16  
**back-door** 242:1  
**background** 9:6 109:16  
**backwards** 70:14  
**bacteria** 138:10  
**bad** 19:10 147:10  
 165:22  
**BAIRD** 1:13 33:9 36:20  
 39:12 48:5 54:4 55:18  
 87:11 90:7 92:5 99:5  
 103:1 107:20 108:16  
 112:14 120:17 121:6  
 123:5 128:19 133:1  
 135:7 140:6 147:1  
 149:16 151:20 154:1  
 155:18 157:17 160:11  
 162:5 172:20 175:20  
 177:16 190:9 196:18

201:3 209:22 216:16  
 219:10 243:1 249:8  
 276:11 282:12,21  
 283:3,7 285:7 287:13  
**baked** 156:19  
**baking** 176:20  
**balance** 67:3 209:1  
**balancing** 327:18  
**ball** 77:2  
**ballot** 318:12  
**ballots** 318:16 319:4,8  
 319:12 320:12 321:11  
 321:13  
**ballpark** 61:19  
**Ballrooms** 1:8  
**bamboozle** 310:2  
**bananas** 62:12  
**bar** 80:16 169:10  
**barrier** 220:17  
**barriers** 85:5 195:11  
 196:1  
**base** 252:21 261:21  
**based** 41:7 98:12 122:1  
 133:18 192:1 209:15  
 209:22 211:5 217:2  
 271:15  
**basic** 258:8  
**basically** 12:9 96:13  
 110:14 178:21 179:14  
 217:11 231:2,7 246:2  
 253:8 317:19  
**basis** 32:4 57:13 237:1  
 274:5  
**bath** 104:9 105:22  
 106:11,20 107:6  
 108:2  
**baths** 106:14,22  
**Baumgartner** 24:7  
**be-determined** 267:21  
**bean** 301:2,2  
**beautiful** 306:14 316:9  
**becoming** 308:4  
**bedevils** 44:5  
**beekeeping** 303:4  
**beer** 83:16  
**beers** 152:16  
**began** 188:2  
**beginning** 290:1  
**behalf** 211:13  
**behaving** 69:16  
**behavior** 10:9  
**behaviors** 311:21  
**believe** 16:14 54:13  
 79:11 103:15 183:2  
 239:3 282:3  
**belong** 123:13  
**bend** 312:21  
**beneficial** 256:8

**benefit** 32:6 78:12  
 290:12 312:22  
**benefits** 78:6,12,15  
**bentonite** 3:16 150:2  
 151:5  
**best** 73:17 119:19  
 163:11 166:17 185:18  
 185:20 198:9 220:4  
 241:5 268:15,21  
 276:20 293:7  
**Betsy** 64:3  
**better** 25:17 59:9 60:14  
 60:18 63:6 69:21 70:7  
 70:12 144:13 167:15  
 181:19 193:15,19,20  
 194:11 196:10 236:7  
 246:6 255:8 262:22  
 265:7,11 268:2 312:9  
**better-** 19:10  
**beverage** 161:7  
**beverages** 151:1  
 152:17 174:14  
**beyond** 73:1 126:11  
 136:9 231:9,10  
 293:17  
**biased** 261:21  
**big** 11:18 22:13 53:2,5  
 73:19 76:14 79:5  
 235:7 254:14 306:9  
 310:7 311:2,6 312:12  
**bigger** 21:2 49:7 130:11  
 308:5  
**biggest** 27:14 116:17  
**bill** 43:8 238:19,20  
**billion** 60:11  
**binder** 202:10  
**binomials** 220:6 221:15  
**biobased** 235:5 296:10  
**biodegradable** 235:5  
 296:10  
**biodiversity** 28:16  
 29:10 33:1,3 234:10  
 234:12  
**biological** 142:15  
**biotechnology** 247:22  
 256:11  
**bipartisan** 238:20  
**bird-** 237:16  
**birds** 128:12,15 134:5  
 308:8  
**birthday** 315:3  
**bit** 7:22 10:13 26:16  
 31:5,12,18 35:2,7  
 64:12 65:8 76:8  
 144:12 185:5 213:9  
 215:6 223:11 230:1  
 240:15 258:7 309:8  
**bite** 261:3

**bites** 260:12  
**black** 19:3 123:16,17  
 259:4  
**bleach** 164:19 165:11  
 165:17 169:17  
**blind** 128:14  
**blinded** 128:12  
**BLM** 294:16  
**blue** 10:20  
**blueberries** 14:12,13  
 16:6  
**blush** 316:22  
**board** 1:3,8 2:10 5:19  
 6:3,5 8:22 11:11,20  
 18:13,14,15 28:2  
 36:12 50:18 51:2  
 56:16 61:16 64:1 69:7  
 69:19 70:13 110:22  
 121:16 124:2,20  
 136:10,18 153:6  
 156:22 161:12 176:21  
 180:1 226:2 229:16  
 232:17 237:16 239:19  
 240:8 245:8 246:10  
 259:10,12 267:5  
 270:14 271:20 279:19  
 290:4 297:19 299:6  
 299:10 304:19 305:17  
 305:20 307:7,13,17  
 313:6 315:6,13  
 325:14 327:8,15,22  
 328:15,21 330:1  
**board's** 6:10 239:18  
**boards** 233:10,13  
**Bob** 35:17 54:9  
**body** 265:19  
**body-** 95:4  
**bolster** 29:15 69:19  
**boots** 68:13  
**bothers** 172:1  
**bought** 52:20  
**bounds** 283:21  
**box** 128:4 129:8 187:10  
 273:6  
**boxes** 128:21 129:4  
 131:4 283:11  
**BPA** 300:9  
**BRADMAN** 1:14 39:4  
 47:19 55:10 87:3  
 89:21 92:11 99:11  
 103:7 108:22 112:20  
 122:16 135:13 140:12  
 146:15 149:8 151:12  
 153:15 155:10 157:8  
 159:12 160:17 162:11  
 164:5 168:1,19 173:4  
 176:4 177:22 186:7  
 190:15 191:17 193:13

194:22 196:15 201:9  
 210:7 216:8 219:4  
 235:19 238:12 239:9  
 242:15 251:6 284:18  
 287:5 299:4 316:12  
 323:8,10,18 324:4  
**brain** 22:7  
**brand** 130:19  
**brass** 306:8  
**bread** 76:22  
**break** 60:13 83:20  
 123:8 228:16  
**breakdown** 16:16  
**breeding** 235:6  
**breeze** 31:3  
**brief** 6:19 88:14 90:21  
 170:20 205:12 273:21  
**briefing** 290:5  
**briefly** 25:22 43:19  
 64:11 65:10 278:12  
 291:19 317:7,13  
**bright** 31:11  
**Brines** 2:12 84:12,13  
 85:8 87:19,20 88:12  
 90:16,17,20 92:15,16  
 99:16,17,18 100:17  
 103:15,19,20 104:5  
 109:7,8 113:6,7  
 121:11,14 124:8,9,22  
 136:2,3 141:6 147:14  
 147:15 149:21,22  
 152:6,7 154:9,11  
 156:4,5 158:4,5  
 160:21,22 162:16,17  
 173:10 174:3,4  
 176:11,12 178:8,9  
 191:2,3 201:19,20  
 210:19,20 216:20,22  
 217:5 226:10 253:22  
 254:1 256:2 259:3  
**bring** 8:5 39:18 81:18  
 81:20 116:20 233:18  
 233:22 236:16 237:12  
 249:11 250:4 256:9  
 256:13,22 263:4  
 275:22 290:15 310:11  
 314:17,20 315:17  
 322:6  
**bringing** 82:3 174:20  
 303:5  
**brings** 36:22  
**BRIONES** 1:14 39:2  
 47:17 55:8 87:15  
 90:11 92:9 99:9 103:5  
 108:20 112:18 119:1  
 122:14 125:2 126:10  
 133:15 135:11 140:10  
 146:13 149:6 151:10

153:13 155:22 157:21  
 160:15 162:9 173:2  
 176:2 177:20 190:13  
 201:7 203:9 204:5,8  
 206:14 210:5 216:6  
 219:2 242:13 279:11  
 285:11 287:17 295:3  
 326:16  
**broad** 234:15 235:3  
**broader** 142:4 230:9,11  
 230:20 294:14  
**broke** 309:11  
**broken** 241:3  
**brokers** 43:10 44:13  
 54:11 206:6  
**brought** 64:16 75:8  
 106:4 189:5 199:3  
 221:9 233:5 250:3  
 293:8 322:11  
**brushy** 138:9  
**budget** 238:16  
**buffer** 180:18 181:13  
**bugger** 69:1  
**BUIE** 1:12 39:8 48:1  
 55:14 87:7 90:3 92:1  
 99:1 102:19 104:7  
 106:6 108:12 113:2  
 122:20 135:17 140:16  
 146:19 149:12 151:16  
 153:19 155:14 157:13  
 160:7 162:1 172:16  
 175:16 178:4 190:19  
 201:13 210:11 216:12  
 219:7 242:19 283:16  
 285:3 287:9 323:3  
 326:1  
**build** 63:21 64:14 118:9  
 129:18 272:3  
**building** 63:19 95:4  
 308:8  
**built** 64:16  
**bunch** 194:7  
**bundle** 21:18  
**bundled** 89:12  
**business** 83:12 198:6,8  
 284:11 308:4 310:7  
 311:3,6 312:12 327:6  
 327:8  
**Business/Closing** 4:18  
**butchering** 226:11  
**button** 123:16,18,18  
**buy** 53:7  
**buyers** 48:17 94:10  
**buying** 80:11 82:11  
 187:22  
**buys** 79:9  
**by-statement** 41:4,12  
**byproduct** 176:19

---

**C**


---

**C** 1:8  
**C-O-N-T-E-N-T-S** 3:1  
**CA** 298:7  
**CACS** 5:7 56:13,14  
 83:12 291:21 298:9  
**CAFO** 308:15,17 309:2  
**CAFOs** 308:7  
**calcium** 3:6,19 88:9  
 91:4 163:2 300:15,17  
**California** 165:8 236:10  
**call** 75:2 119:18 130:17  
 186:4 194:13 198:2  
 204:1 274:1 283:22  
 289:15 330:5  
**called** 13:6 197:19  
 275:22 311:8 316:4  
**calling** 289:5  
**calls** 31:19 314:2  
 316:17  
**calves** 109:21 113:19  
**canaries** 62:18  
**candidates** 320:3  
**capability** 70:21  
**capacity** 10:8 180:18  
 181:13 222:19 231:17  
 241:11 248:5  
**capel** 107:1  
**carbon** 3:18 9:17 19:3  
 160:20 161:2,5,17  
**carbonate** 3:17 156:4,8  
 156:11 157:3 296:18  
 300:15,19  
**carbonation** 161:7  
**carcinogen** 165:2  
**card** 324:16  
**care** 129:1 165:16,16  
 168:21  
**careful** 307:16  
**carefully** 269:5  
**cares** 52:3  
**caring** 24:3,3  
**Carob** 301:2  
**carried** 65:6  
**carry** 241:18  
**cartons** 308:15  
**carve** 72:17  
**CAS** 99:20 201:21  
**case** 61:19 64:14,16  
 73:3 137:7 142:22  
 165:20 166:11 169:16  
 182:5 207:16,20  
 270:10  
**cases** 169:10 205:16  
**casings** 3:21 191:1,14  
 191:17,22 192:6,11  
 192:22 193:1,2  
 197:11 198:3 200:19

212:22  
**cast** 277:11 318:16  
**catch** 152:5  
**category** 196:22 212:15  
**cattle** 104:10,16 125:11  
 130:10 194:3  
**cause** 100:8 182:7  
**causing** 138:8 289:6  
**cautionary** 185:2  
**CCOF** 143:11 203:3  
**celery** 194:15 235:8  
**cell** 245:5,12 253:13  
 254:5,11 255:11,13  
 255:22 256:4 261:4  
 264:12,14 269:11  
 272:11 286:22  
**cells** 257:16  
**cellulose** 4:6 187:18,19  
 188:11 226:5,9  
 227:11 228:11  
**center** 20:20 21:14  
 233:7  
**centers** 311:11  
**cents** 265:14  
**certain** 116:4 120:4  
 168:13 180:4 182:17  
 203:11 229:21 262:15  
 268:16 274:16 278:10  
 280:5 328:20  
**certainly** 28:20 29:6  
 57:11,20 78:8 79:20  
 144:9 167:7,14 171:6  
 180:16 181:6 215:3  
 222:4,19 223:13  
 280:13 294:8  
**certificate** 304:14  
 305:14  
**certification** 6:6,8  
 22:16 27:20 28:5,12  
 44:14,17 57:13 85:10  
 141:19 207:22 223:17  
 225:5 227:16 250:6,8  
 252:21 253:5 311:18  
 312:1,2,5,6  
**certified** 41:3,12,13  
 43:11 71:1,8 76:3,10  
 76:11 174:12 185:9  
 197:10 200:8 204:4  
**certifier** 34:5,13 67:9,21  
 68:4 101:8 198:2  
 208:13 249:21  
**certifier's** 198:2  
**certifiers** 15:5 29:1  
 31:20 33:2 35:1,8  
 42:4,10,22 66:14,21  
 67:5 68:1,14,15 71:1  
 79:20 80:1 83:3 91:2  
 93:13 141:20 143:11

203:6 211:13 224:22  
 249:13 250:6,8 312:5  
**certify** 30:9  
**certifying** 32:6 41:13  
**cetera** 293:17  
**CFR** 98:16 100:2,4  
 122:3  
**chain** 39:18 44:15  
 51:13,18 55:3 62:14  
 74:12 75:2 77:14  
 80:21 81:2 82:13,16  
 143:4 192:22 193:11  
**chains** 72:20 73:16  
**chair** 1:10,11,12 22:17  
 39:14 48:8 55:22 84:8  
 87:16 90:13 92:12  
 99:13 103:10 109:4  
 113:3 122:22 135:20  
 140:20 147:2,11  
 149:18 152:1 154:5  
 156:1 158:1 160:18  
 162:13 173:7 176:8  
 178:5 190:21 199:21  
 201:16 210:15 216:17  
 219:12 243:5 285:12  
 287:19 298:16,18,19  
 313:12 317:11,11  
 318:14,15,17,18  
 319:2,3,7,16,16  
 320:12,19 322:17,20  
 322:21 323:10 324:5  
 324:5,8,8,9,21 325:16  
 326:11  
**chairs** 291:19  
**challenge** 171:15,19  
 205:20 246:9,12  
**challenges** 33:21 181:4  
 213:13  
**challenging** 205:15  
**chance** 30:4 66:8  
 248:15  
**chances** 93:9  
**change** 4:4 14:7 18:10  
 19:7,13 21:11 39:21  
 42:19 50:13 114:1  
 191:7 215:14 218:17  
 224:4,4 225:13,15,20  
 253:12 254:6 258:7  
 258:12,14,21 259:6  
 259:15 265:1 278:15  
 278:17 286:15,16  
 301:11 302:3  
**changed** 18:20 40:5  
 110:4 150:11 214:13  
 243:17,18 277:18  
 288:6 289:6  
**changes** 49:19 50:13  
 191:5 229:10 244:5

270:7,11  
**changing** 24:14,15  
 212:2 262:15 272:7  
 277:12 290:18  
**channel** 148:7  
**chaos** 280:21  
**charge** 50:16 54:9  
 80:17 136:21 198:5  
 240:14  
**chart** 274:1,18,19 275:4  
 286:3,4 287:1  
**check** 56:4 118:21  
**checked** 85:15 93:11  
**checklist** 85:13 195:20  
 196:11  
**checklists** 93:11  
**cheese** 178:20,21 179:5  
 182:1,2 186:18 187:5  
 187:11,14,15,21,22  
**cheesewax** 297:2  
**Chellie** 238:19  
**chemical** 181:12  
**chemical-functional**  
 180:21  
**chicken** 128:2 129:3  
 131:10 134:1 308:7,9  
**chickens** 62:9 125:10  
 129:1,2 130:8,21  
 308:13,14  
**chiggers** 132:7  
**child** 165:16,16 168:21  
**chips** 16:17  
**chlorhexidine** 3:6  
 84:19,19 85:1 86:18  
**chloride** 173:10 174:6  
 174:10 175:11 297:2  
 300:12,16  
**chlorine** 3:6,7,19,19  
 87:19,21 88:2,5,10,13  
 88:15,21 89:14  
 159:13,15 162:15,19  
 162:21 163:3,8,11  
 165:1 167:4,15 170:8  
 170:10 171:1,5,9  
 172:1,8,9 173:13  
 199:7 235:8 300:2  
**chlorite** 3:18,20 158:4,8  
 158:18 159:21 300:2  
**Chloroform** 164:22  
 165:1  
**choice** 171:5 183:21  
 184:2 188:6  
**choose** 319:13  
**choosing** 30:22  
**chord** 306:12  
**chords** 306:11  
**Chorus** 327:2  
**circle** 54:7 234:17

**circulates** 325:8  
**cisgenesis** 244:10  
 245:1,10 253:13  
 254:11 255:7,17  
 264:15 269:12  
**citations** 273:22  
**cited** 125:22  
**citrate** 180:6,20 181:8  
 184:14 296:5 300:3  
**citric** 158:11 212:17  
**citrus** 211:5  
**claim** 95:8  
**clarification** 15:16  
 42:11 111:7 120:19  
 123:1 188:21 191:4  
 255:6 269:11  
**clarify** 110:20 127:12  
 184:12 206:2 254:1  
**clarifying** 3:12 57:3  
 141:3 145:18  
**clarity** 143:17 144:5  
 246:11,11 251:8  
 252:2 261:5 267:16  
 276:16 293:15  
**classes** 221:17  
**classic** 16:3  
**classification** 134:22  
 189:14 193:4 224:4  
 300:12  
**classifications** 224:5  
**classified** 124:20 135:1  
 136:18 139:22 152:20  
 217:15  
**classify** 139:21  
**clay** 148:6 150:6  
**clays** 150:5 152:15  
**clean** 106:21 168:22  
 169:4  
**cleaned** 44:8  
**cleaner** 88:21  
**cleaning** 165:11  
**clear** 9:18 21:1 26:2  
 33:6 46:16,22 49:5  
 52:6 166:12 190:2  
 194:22 215:14 217:21  
 223:3 244:22 250:9  
 259:8,13 264:11  
 265:16 269:19 272:12  
 280:9 287:2 319:2  
**clearest** 222:20  
**clearly** 25:14 49:13  
 64:6 174:1 247:7  
 316:8  
**clever** 310:1  
**click** 67:18  
**client** 198:4  
**clients** 211:14  
**Cliff** 80:16

- climate** 40:3 278:14,16  
**Clinics** 164:21  
**clock** 280:1  
**close** 43:8 141:9 195:13  
     302:16 330:15  
**closed** 207:3  
**closely** 8:20 181:9  
**closer** 147:6  
**closest** 180:19  
**closing** 49:1 77:13  
     203:19 327:6,8,9  
**cloth** 15:7 16:8  
**cloths** 17:2  
**co-** 199:20  
**co-mingling** 199:14  
**co-sponsors** 238:20  
**coagulant** 174:11  
**coal** 62:18  
**coal-fired** 132:15  
**coffee** 62:12 184:6  
**cognizant** 36:21  
**cold** 85:17,21  
**collaboration** 144:8  
     325:7  
**colleagues** 247:16  
     278:13 279:12 329:3  
**collect** 319:8,12 324:19  
**color** 20:18,19 21:16  
     22:3  
**Colorado** 294:8,9  
**colored** 18:18 19:19,21  
**colors** 318:21  
**combined** 114:10,21  
     133:19  
**combining** 114:13  
**come** 5:4 6:5,13 7:16  
     8:14 19:12 21:9 29:14  
     37:21 44:14,17 58:21  
     114:12 123:9,14,18  
     132:3 145:1 167:1  
     168:2 188:22 189:3  
     196:5 198:13 204:13  
     217:13 222:2,21  
     226:18 229:1,2  
     231:13,14 237:10  
     254:15 271:2 272:13  
     286:18 294:15 302:14  
     305:22  
**comes** 73:2 105:13  
     132:15 163:18 192:20  
     279:20 290:4 314:8  
**comfortable** 11:3,7  
     266:12 280:5,19  
     321:8  
**comfrey** 139:12,14  
**coming** 61:1,8 63:13  
     66:21 81:21 82:7  
     85:18 179:1 184:9  
     189:13 203:11 207:7  
     213:5 248:22 262:12  
     271:3 292:5 300:5  
     309:4  
**command** 227:22  
**comment** 7:6,8 8:12  
     9:12 10:15 15:1 23:17  
     23:19 27:6 42:8,16  
     43:13 73:22 78:19  
     83:6 93:14 97:21  
     101:9,10 114:6,7  
     116:10 118:15,15,18  
     121:20 125:15 131:20  
     132:22 144:22 148:10  
     152:22 156:16,17  
     158:22 159:4 161:10  
     163:10 164:2 174:15  
     174:17 176:21 179:3  
     179:4,8 183:13  
     192:19 197:11 202:18  
     209:6 211:11 212:9  
     215:12,13 217:18  
     219:20,22 220:1  
     222:22 229:12 231:1  
     233:4 234:1,2 238:13  
     241:8 244:22 249:16  
     254:3 255:6,8 257:8  
     260:9 264:3,3 266:4  
     269:20 290:17 293:13  
     294:7,12 301:8 302:2  
     328:5,7  
**commented** 133:3  
     143:12 264:22  
**commenter** 106:5  
     125:16,22 126:7,10  
     126:15 133:16 180:8  
     182:21  
**commenters** 8:16,18  
     24:13 27:9 44:4 57:17  
     93:6 94:16 101:5  
     105:9 114:9,15,20  
     125:19 126:21 214:14  
**comments** 11:10,13  
     12:19 13:3 14:2 18:5  
     21:7 22:10 23:6 24:10  
     24:13,14,19 25:9  
     26:17,18 35:17 43:19  
     49:11 51:5,11 80:7  
     81:6 88:19 89:4 101:2  
     101:3 105:2 110:7  
     114:5 125:14 137:19  
     138:1 143:5,9,10  
     145:5,11 148:13  
     150:10,15 153:2  
     154:21 163:20 164:6  
     176:22 177:3 180:17  
     187:5 192:2,19  
     196:18 197:19 203:16  
     205:4 209:7,8 211:19  
     212:16 214:11 215:17  
     217:12 218:7 220:9  
     220:16 224:6,12,16  
     228:5 235:20 237:7  
     242:4 244:12 251:4  
     251:20 252:10,10  
     260:8 261:7 265:4  
     279:22 280:22 289:3  
     289:15 291:5 315:16  
     327:17 328:4 329:20  
**commercial** 181:11  
     197:15 207:21 208:10  
     208:18 212:12 225:17  
**commercially** 114:15  
     115:12 139:10 224:7  
**commingled** 20:22 21:6  
**Commission** 236:11  
**commissioned** 104:12  
**commitment** 306:3,19  
**committee** 5:6,7 56:14  
     104:13 106:3 150:18  
     153:3 159:6 191:20  
     195:7 196:8 225:14  
     246:7 266:11 267:7  
     269:4 292:19 297:21  
     298:4,7,8,9 302:12  
     313:13,16 325:7  
**committee's** 105:12  
**commodity** 73:7  
**common** 187:2,4 225:8  
     251:10 306:5  
**commonly** 114:10  
     116:16 176:19 224:21  
**communicate** 80:1  
     231:18,18  
**communicating** 70:12  
     253:1  
**communication** 59:1,6  
     79:17,18,19  
**community** 24:9 28:12  
     81:12 200:11 230:8  
     230:10,12,21 235:12  
     237:9 238:22 241:9  
     241:12 256:10 260:11  
     261:14 265:18 266:5  
     279:17 306:16,20  
     312:18  
**companies** 80:14,15  
     198:12  
**company** 57:7,7 80:13  
     187:8  
**compared** 53:4 194:7  
     307:21  
**comparison** 167:10  
     180:19  
**compatibility** 126:12  
**compelling** 308:16  
**competitive** 231:7  
**complaints** 64:20,21  
**complete** 35:11 279:1,2  
**completed** 85:7 92:21  
     100:15 104:3 148:3  
     158:13,14 161:3  
     163:6 174:8 178:13  
     211:2 318:9  
**complex** 71:21 289:18  
     290:11  
**compliance** 22:15  
     71:10 81:8 100:1  
     171:11  
**compliant** 159:9  
**complicates** 20:1  
**complication** 19:17  
**complicity** 310:3  
**comply** 41:21,22 159:2  
**complying** 80:22  
**component** 241:2  
**comprehensive** 74:6  
     89:5 159:5 164:3  
     166:3,21 167:20  
     168:6 170:4 172:3  
**computer** 152:4  
**concentrate** 106:17  
**concentrations** 214:5  
**concern** 17:5 26:5,21  
     28:10,13 61:20 66:15  
     70:8 101:4 119:6  
     127:2,7 167:5 179:9  
     182:8 192:3 199:4  
     207:14 209:8 248:17  
     248:20 254:7 261:5  
     269:22 278:17  
**concerned** 10:7 62:16  
     105:21 129:7 181:19  
     199:13 273:6 281:12  
     281:13  
**concerning** 295:13  
**concerns** 26:10,13  
     27:14 49:13,15  
     179:14 298:19  
**concludes** 147:5  
     291:10  
**conclusion** 225:14  
     318:5  
**conclusive** 179:15  
**conditions** 125:17  
**conduct** 284:10  
**conducted** 85:2 236:5  
**confectioners** 211:22  
**conference** 278:15  
**confidence** 69:19  
**confident** 137:21  
**confidential** 320:11  
**confidentiality** 64:15  
**confidentially** 171:3

**confirmation** 42:11  
**conflict** 132:8  
**confused** 117:13  
 264:13 282:14  
**confusing** 271:8  
**confusion** 26:3 45:13  
 117:3 143:16 245:11  
 259:17 289:6 297:21  
 298:2  
**Congratulations**  
 324:22  
**Congress** 311:7  
**connected** 70:1  
**connection** 240:16  
**consensus** 235:11  
 277:22  
**conserve** 8:18  
**consider** 16:12 43:21  
 77:9 115:2 136:15  
 170:15 262:5  
**consideration** 183:6  
 289:20 317:15  
**considerations** 137:12  
**considered** 16:11 40:14  
 40:22 132:11 136:10  
 153:1 164:19 183:2  
 264:14 297:12  
**considering** 220:3  
**considers** 6:9  
**consistency** 141:19  
 220:4 246:17 263:4  
 274:5  
**consistent** 14:22 34:15  
 34:16 249:18 252:7  
 271:19 275:21 276:7  
 282:20 304:7  
**consistently** 220:19  
 248:9 297:11  
**constant** 64:18 272:7  
**constantly** 249:3  
 261:16  
**constituents** 241:15  
**constraint** 57:21  
**consult** 240:6 254:21  
**consultation** 251:13  
**consulting** 248:5  
**consume** 184:18,19  
**consumer** 43:7 75:9  
 79:9 80:13,15 159:2  
 183:18 314:19  
**consumer's** 79:6  
**consumers** 62:8,22  
 79:7,15 95:7 141:21  
 182:10 185:7 188:5  
 308:13 310:13,16  
 311:14 312:13 313:2  
**consumers'** 188:3  
**consuming** 184:1

**consumption** 10:2  
 185:19  
**cont** 4:1  
**contact** 158:10 162:20  
 163:9  
**contacts** 231:16  
**contain** 116:11  
**container** 3:2 6:21 7:21  
 8:4 13:7,19 14:4  
 15:18,19,21 17:7,12  
 296:11 310:1  
**containers** 7:4,17,21  
 13:21 14:13 17:22  
 41:7,20  
**contamination** 163:19  
 171:17 291:3 303:18  
**contentious** 314:8  
**context** 36:7  
**continual** 29:1  
**continually** 166:5  
**continuation** 296:9  
**continue** 5:7 6:16 38:18  
 40:16 50:8,18 51:2  
 67:6 72:3 75:3 146:2  
 229:2 241:12 245:22  
 247:4 266:2 284:15  
 288:1 300:10 312:20  
 325:22  
**continued** 114:8 303:20  
 315:19  
**continues** 285:14  
**continuing** 88:1 99:19  
 150:1 152:8 162:17  
 169:20 176:13 221:10  
 228:3,10 246:13  
 328:20  
**continuous** 192:3  
 267:20 310:22  
**contribute** 265:21  
**control** 104:9 125:6  
 159:1 161:8 164:14  
 181:10 311:5  
**controversy** 26:8  
**convenience** 187:22  
**conventional** 128:3  
 130:22 163:16 199:4  
 199:12 208:7 209:10  
 209:10 212:4 214:5  
 239:7  
**conventionally-sour...**  
 212:5  
**conversation** 16:10  
 83:8 173:12 180:15  
 233:12 234:9 241:6  
 247:14 262:7 277:4  
 277:21 293:5  
**conversations** 59:4  
 63:22 124:3 270:12

293:9 328:13  
**convert** 3:3 23:1  
**convinced** 60:1,20  
**Cooperative** 94:11  
**coordinates** 37:17  
**copper** 3:9 99:15  
 103:18 104:2,7,19  
 107:15 108:6 235:5  
**copy** 206:20  
**corn** 53:16 199:9  
**Cornucopia** 126:17  
**correct** 45:13,14 46:4  
 47:1 121:19 130:10  
 205:8 206:4 221:5,6  
 226:11 246:2 255:12  
 286:3 295:21 324:1  
**corroding** 310:9  
**cost** 32:19 44:17 78:12  
 78:15 132:17  
**cost-** 32:5  
**costs** 78:7  
**Council** 199:22  
**counted** 319:4  
**counting** 318:11  
**countries** 12:2,4 71:21  
**country** 35:21 36:15  
 67:21 68:4 94:22  
 116:18  
**couple** 10:14 52:20  
 58:19 79:9 105:9  
 114:15 115:20 197:13  
 209:7 218:6 227:11  
 233:22 243:12 289:15  
 293:21 304:6 315:3  
**course** 13:8 33:13  
 40:11 139:7 169:6  
 182:2 239:2 249:11  
 278:4 329:6  
**Court** 69:18  
**cover** 17:21 120:8  
 316:5,6  
**covered** 282:13,13  
 306:8  
**covering** 16:19  
**covers** 296:20  
**cow** 33:15  
**cows** 33:11 34:10 82:10  
 308:16,21  
**CPG** 80:13  
**crack** 248:4  
**crammed** 308:8  
**crazy** 48:21 75:20  
 170:12  
**cream** 176:20 181:18  
 181:20,22 182:21  
 183:7 218:5 315:7,8  
**create** 218:10 270:5  
**created** 230:5

**creating** 173:19 195:16  
**creation** 311:17  
**creative** 281:6  
**creature** 246:16  
**credited** 312:6  
**creep** 278:18,18,19  
**criteria** 37:6 98:13  
 122:2 169:11 209:16  
 244:15,16,20 257:5,7  
 257:12,20 258:1,5,9  
 262:21 263:2 264:8,9  
 272:6,12 274:19  
 322:3  
**critical** 131:18 150:16  
 153:1 167:7 171:10  
 171:21  
**critically** 170:7  
**critique** 250:22  
**crop** 15:12,12,20 22:12  
 23:1 30:9 52:17 53:4  
 53:10 94:11 130:3  
 142:6 171:17 221:5  
 221:10 309:9 316:6  
**CROPP** 117:7  
**cropping** 199:15  
**crops** 5:6 6:17 8:7  
 14:19 15:3 17:21 53:1  
 53:2 105:10 125:5  
 132:3 142:13 220:22  
 223:4,13,18 229:11  
 295:17 296:1 298:1,8  
 302:15 316:5  
**crossed** 89:6  
**crossroad** 312:20  
**crushed** 152:15  
**crystal** 166:11  
**cultivation** 36:4  
**cultural** 37:5,8 142:15  
**culture** 234:6  
**cupboard** 187:11  
**curd** 202:7  
**curious** 8:21 28:3 56:22  
 106:10 115:19 208:20  
 297:8  
**current** 20:9 138:5,13  
 216:22 218:11 243:13  
 256:5 262:22 298:18  
**currently** 12:11 14:8  
 114:7 125:4 178:17  
 202:19 217:14 301:17  
**curve** 33:17  
**customer** 75:14 173:19  
**customers** 76:13  
 181:21  
**cycles** 12:6

---

**D**


---

D 296:4

- Dae** 55:6  
**daily** 262:10  
**dairies** 107:1 308:15  
**dairy** 82:11 89:1 94:1,2  
 94:19,22 95:7,12 96:1  
 96:11 97:11 98:5  
 100:13 104:10,16  
 106:19 109:13 112:3  
 113:12 178:12,17  
 309:1 313:14 315:6  
**Dakota** 294:9 295:5  
**Dan** 1:18 56:19 100:16  
 101:17 102:14 109:14  
 110:20 112:7 113:14  
 115:9,21 122:5,8  
 190:6 207:12 208:2  
 251:19 255:3 260:7  
 269:1 280:2 286:8  
 288:5 291:8 297:3  
 304:4,10,11 326:3  
**Danone** 94:12  
**data** 165:7 198:16,19  
 205:15 237:21 238:3  
 238:6 290:12  
**database** 205:11 206:2  
**date** 103:14 121:13,14  
 121:18 216:20 217:1  
**dated** 152:12 154:15  
 156:8  
**dates** 226:11,15  
**Dave** 1:16 9:12 35:15  
 36:20 56:19 58:17  
 102:17 115:17 144:3  
 145:22 169:13 172:14  
 199:1 230:18 242:10  
 249:11 252:15 278:7  
**David** 72:12  
**day** 13:13 167:11  
 308:12,22  
**daylight** 12:5,6  
**days** 27:20 100:10,12  
 109:11,12 111:8,9  
 113:10,12  
**DDT** 164:13  
**de-oiled** 301:3  
**deal** 7:3 15:9 23:10 43:5  
 129:17 168:20 195:8  
 220:9 309:10  
**dealing** 7:15 61:7 94:8  
 171:17 292:6  
**dear** 279:7  
**dearly** 306:1  
**debate** 224:19  
**debt** 53:6  
**debud** 109:21 113:19  
**deception** 310:2  
**deceptively** 309:21  
**decide** 245:12  
**decided** 40:16 227:20  
 257:19 259:12 264:14  
 267:22 288:18  
**deciding** 244:16  
**decision** 66:4,7,11  
 217:20 241:18 252:1  
 252:21 253:6 258:15  
 259:9 281:14,15  
**decisions** 182:13  
 213:14 250:7,9  
 268:14,21 328:2  
**declared** 166:10  
**decree** 278:15  
**dedicated** 238:16  
 305:15  
**dedication** 330:2  
**deeper** 204:17  
**defensible** 248:9  
**deferred** 4:11 291:13  
 305:3  
**deficiency** 195:8  
**define** 25:21 26:2 142:1  
 142:8 144:20 250:20  
 257:6 263:15 274:12  
**defined** 27:3 71:4  
 251:14 257:14  
**defining** 26:21 142:3  
 252:7,7 258:3 276:17  
**definitely** 11:3,16 12:14  
 16:1 20:12 22:13  
 25:11 29:12 31:21  
 34:17 49:8 51:7 82:2  
 96:19 143:16 166:15  
 167:4 170:21 171:5  
 232:4 234:9 235:7  
 248:19 249:9 316:7  
**definition** 24:15,16  
 27:13 40:20 145:7,10  
 243:13 245:1 248:16  
 249:14 252:18 253:4  
 255:8 257:2 259:18  
 262:13 264:4,22  
 272:3,8 274:3 275:20  
 278:1 281:21 283:2  
 283:11 324:1,3  
**definitions** 245:9,13,15  
 246:4,19,21 247:11  
 247:11,21 248:2,10  
 249:9,20 250:10  
 251:7 253:10,17  
 257:9,22 260:18  
 261:1 262:20 263:1  
 263:11,16 264:2,7  
 269:19 271:4,7,12,17  
 272:5,18 273:2,6,13  
 274:2,14,15,21 276:1  
 277:7,15 279:2,2,14  
 279:15,16 281:7  
 282:18 283:17  
**definitive** 280:12  
**degrading** 16:8  
**degree** 10:22 234:12  
 235:10  
**delay** 260:1  
**delaying** 254:7 259:9  
**delays** 254:17  
**delegates** 325:10  
**deliberations** 327:16  
**delisted** 115:6  
**delude** 312:21  
**demand** 53:16,18 54:1  
**demanding** 75:15 233:8  
 310:17  
**demonstrates** 203:10  
**denying** 66:7  
**department** 1:1 50:12  
 54:6 78:4 80:17  
 173:21 200:12 233:19  
 236:10 256:14 270:13  
 276:18  
**Department's** 51:16  
**depending** 7:19 236:15  
 298:21  
**depends** 16:4  
**depth** 32:7 306:2  
**deputy** 2:18 290:3  
**derived** 174:7 178:18  
 202:3  
**describing** 241:1  
**description** 273:21  
 274:3 275:4 283:1  
 325:15  
**descriptions** 275:19,21  
 276:4,5,12,14 277:7  
 277:15  
**design** 33:22  
**Designated** 2:20  
**designs** 34:5  
**desire** 213:1  
**despite** 51:21  
**desserts** 156:19 204:9  
**destroy** 35:4  
**destroyed** 30:11  
**detail** 7:9,22 25:2 27:2  
 51:9 93:13 274:13  
**detailed** 24:12  
**details** 67:13 222:12  
**detecting** 58:3  
**detergents** 156:21  
**determination** 38:2  
 244:21 274:20 298:14  
**determinations** 34:16  
 275:1  
**determine** 73:17 81:8  
 221:22 276:4  
**determined** 261:4  
 282:16 283:4 287:1  
**determining** 37:15  
**develop** 193:18 262:13  
 263:10 288:18,19  
 293:4  
**developed** 94:3 189:5  
 198:13  
**developing** 42:5 262:19  
 293:3  
**development** 136:13  
 192:5 200:12,13  
 234:7 304:4 324:12  
**Devon** 2:16 329:4  
**devotion** 306:19  
**DFO** 329:10  
**di** 300:18  
**dialog** 59:5 68:22  
**dialogue** 212:7 240:1  
 248:19  
**diatomaceous** 3:16  
 127:15,18 129:20  
 131:12,15 149:20  
 152:10 153:8  
**dicey** 15:2  
**diet** 199:7  
**dietary** 174:12  
**difference** 111:10 120:1  
 137:6 186:20 266:7  
**differences** 36:22 107:4  
 278:9 280:4  
**different** 7:9 9:2,6 11:1  
 14:8 16:5 17:14 27:12  
 31:12,16 42:3 61:7  
 72:19 73:8 77:2 82:15  
 94:7 130:8 137:11  
 222:12 223:11 230:14  
 243:19,20 244:16  
**differently** 145:6  
 192:18  
**difficult** 82:15 193:6,11  
 215:3 220:18 222:17  
 309:14  
**difficulty** 194:6 212:8  
 212:10 215:5  
**digging** 49:9 74:10  
**dihydrogen** 300:3  
**diligence** 58:11  
**diligent** 167:1  
**dilution** 128:8  
**dioxide** 3:7,18,19 88:10  
 160:20 161:2,5,17  
 163:3 300:2,19  
**dip** 85:3,17,21 303:3  
**direct** 49:20 56:18  
 158:9  
**directed** 77:4  
**direction** 8:15 9:19 52:8  
 227:9

**directions** 9:2  
**Directives** 66:13  
**directly** 21:19 105:14  
 118:17 298:15  
**Director** 2:14  
**disagree** 107:20 280:10  
**disagreed** 215:14  
**disappear** 315:18  
**discard** 100:12  
**discerning** 310:16  
 311:14  
**discharge** 167:6  
**disciplines** 241:4  
**disclaimer** 277:8  
**disclosed** 73:9  
**disclosure** 186:3,4  
 214:17  
**disconnect** 17:20 18:1  
**discordant** 306:13  
 307:3  
**discourage** 58:11  
**discretion** 239:18  
 320:14  
**discuss** 21:10 24:18  
 25:21 143:19 222:5  
 291:19  
**discussed** 142:3  
 230:16 256:8 290:6  
 316:5  
**discussing** 11:13  
 221:12 267:1  
**discussion** 3:2 4:3,10  
 5:20 6:12,20,22 7:2  
 7:13 8:13 16:15 18:17  
 20:14 23:8 25:7 38:19  
 39:20 45:1,17,21  
 46:10 47:4,8 48:11  
 54:21 56:3 59:1,8  
 86:14 89:10 91:12  
 93:21 96:8 97:4 98:9  
 101:18 102:10 108:3  
 110:16 111:5 112:3  
 115:10,17 117:5  
 121:7 126:5 134:14  
 144:3 146:2,7 148:19  
 150:20 151:3 153:5  
 155:1 159:11 161:14  
 164:4 169:22 175:2,5  
 177:6 180:8 186:20  
 186:22 189:21 192:2  
 192:9,14 200:17  
 203:1 209:12 212:20  
 219:16 220:11 222:3  
 222:5 227:19 232:12  
 235:17,19 237:11  
 238:22 242:5 245:7  
 245:19 267:14 284:15  
 285:14 288:4,11,14

288:17,21,22 292:1  
 316:18  
**discussions** 237:7  
**disease** 125:6 165:22  
**diseases** 104:10,16  
**disinfect** 163:9 169:1,5  
**disinfectant** 88:7,16  
 162:22 165:12  
**disinfectants** 84:21  
**disinfected** 85:17  
**disinfecting** 88:3  
 158:20 162:19  
**disinfection** 169:7  
**dislike** 171:22  
**disposal** 13:2 105:16  
 106:11  
**disposed** 104:20  
 105:18 106:2 320:12  
**disregard** 207:8  
**dissonant** 306:11  
**distribute** 319:8  
**distributed** 230:18  
**distribution** 41:16  
**distributors** 62:20  
**dive** 51:9  
**diverse** 72:20  
**diversity** 24:4  
**Division** 2:15  
**docket** 7:11 207:4,10  
 237:9 264:6 277:10  
 289:4 294:3 325:13  
**docket's** 207:3  
**Doctor** 329:3  
**document** 3:2 4:3,10  
 6:20 7:2,13 16:15  
 40:15 43:16 44:6  
 46:13 64:9 145:1  
 219:16,19 220:8  
 222:3,6 229:9,15,19  
 231:5 235:12 236:22  
 237:11 243:9 245:16  
 245:21 246:10 247:2  
 249:3 251:16 252:5  
 253:3,15,16 255:22  
 256:3 258:18 262:2  
 262:22 263:19 265:15  
 265:15 267:17 269:6  
 275:1,22 279:21  
 280:14 282:2,5,6,10  
 282:17 283:9,17,19  
 284:3,4,5,15 288:2,5  
 288:18,22 290:7  
 292:5 303:20 309:13  
**documentation** 57:6  
 68:12 309:6  
**documented** 32:17  
**documents** 71:20  
 288:11 289:1

**dodecylbenzene** 300:1  
**dogging** 237:17  
**doing** 27:17 67:3 68:5  
 69:20 70:7 75:16,21  
 76:21 79:6 81:9,13  
 85:18 131:1 158:18  
 170:15 200:6 228:3  
 232:7,14,21 239:22  
 249:5 256:15 272:1  
 329:14  
**dollars** 237:18 238:1  
 239:5,5  
**domestic** 51:13 74:17  
 74:19 125:10 213:2  
**domestically** 30:17  
 51:19 213:11  
**door** 185:7,8 203:19  
 295:22  
**doubled** 111:16,17  
**dovetail** 33:6  
**dozen** 46:14  
**dozens** 73:13  
**draw** 57:11  
**dream** 197:20  
**dried** 187:5  
**drink** 184:5  
**Drinking** 88:7 163:1  
**drove** 48:20  
**drug** 99:21 100:2 102:2  
**drugs** 116:22  
**ducks** 125:10  
**due** 58:10 141:8 148:12  
 219:19  
**dug** 229:11  
**dump** 106:16  
**dumped** 106:15  
**dumping** 105:22  
**dunk** 263:14  
**duration** 109:18 113:17  
**dust** 128:4,20 129:4,8  
 130:14 131:4 133:20  
**duties** 324:9 326:11  
**dying** 167:11

---

**E**


---

**ear** 46:12  
**earlier** 202:12 292:1  
**early** 38:21 103:16  
 121:17 154:21 156:11  
 158:18  
**earth** 3:16 10:9 127:15  
 127:18 129:20 131:13  
 131:15 149:21 152:10  
 153:8  
**easier** 74:19 171:21  
 184:15 252:1  
**easily** 207:6 232:19  
 290:13

**East** 64:3  
**Eastern** 295:1  
**easy** 130:5 263:17  
 272:12 309:15  
**eat** 167:12 184:6 194:19  
**eaten** 82:10  
**echo** 11:12 12:8,14  
 20:13 79:3 130:3  
 171:14,22 186:5,7  
 196:18 215:10 252:9  
 260:7 263:22 294:5  
 299:4 315:22  
**echoes** 236:2  
**ecology** 234:3  
**economic** 44:16 77:6,9  
 78:1 200:12,13 234:7  
**ecosystem** 24:17 25:21  
 26:6,21 30:6 31:15  
 33:4 35:3 36:12 37:19  
 223:10  
**ecosystems** 3:4 23:1  
 23:22 27:16,22 29:11  
 30:19 32:8 292:11  
**edge** 249:1  
**educated** 34:11  
**education** 257:18  
**effect** 53:14 77:19,22  
 89:1 139:14 181:15  
**effective** 115:3 116:15  
 116:16 181:9 198:11  
 231:19 236:20  
**effectiveness** 85:5  
**effects** 100:7,19  
**efficiencies** 173:19  
**efficiency** 10:7,11  
 170:22  
**efficient** 227:20  
**effort** 232:16 251:13  
 327:18  
**egg** 128:17 308:15  
**eggs** 62:9 76:16  
**eight** 100:10 111:9  
 244:14  
**either** 65:5 94:5 114:20  
 118:21 127:22 183:15  
 203:16 213:8 228:4  
 247:18 280:19 283:1  
 312:20 319:13 321:14  
 324:17  
**ELA** 1:15 15:2 17:5  
 20:13 39:6 47:21  
 55:12 87:5 90:1 91:21  
 98:21 103:9 109:2  
 112:22 122:18 130:2  
 135:15 140:14 146:17  
 149:10 151:14 153:17  
 153:22 155:12 157:11  
 160:5,10 161:21

- 171:13 173:6 176:6  
176:18 178:2 190:17  
192:16 201:11 205:2  
210:9 214:9 216:10  
217:11 218:6 219:6  
237:14 241:7 242:17  
263:8 266:9 267:2  
284:20 286:12,15,19  
287:7 294:5 302:10  
315:12  
**elaborate** 126:6 223:6  
**elected** 318:2,4 319:21  
**election** 317:8 319:10  
319:18 322:20  
**elections** 4:16 317:5,10  
318:16 325:10  
**electrolytes** 303:9  
**elegant** 27:11  
**element** 132:13  
**elemental** 296:21  
**elephant** 202:4  
**Eleven** 210:16  
**eligible** 317:15  
**eliminated** 320:2  
**eliminating** 3:3 22:22  
**email** 75:14 302:14  
**emails** 206:19  
**emerge** 40:9  
**emergence** 192:4,10  
**emergency** 3:12 141:4  
141:17 142:1,4,5,9  
145:8,19  
**emerging** 79:8 262:9  
**Emily** 1:17 11:11 20:2  
25:7 31:9,22 38:3,11  
38:16,20,21 45:18  
46:9 47:12 63:18 79:2  
111:20 120:6 126:5  
126:18 131:20 144:6  
149:3 166:8 182:4  
184:10 206:9,16  
213:15,22 221:6  
223:1 229:7 231:3  
242:9 247:9 248:20  
260:5 265:5 272:14  
278:5 279:4 284:1  
292:17 295:7 313:21  
316:1 321:2 322:22  
**Emily's** 130:3 185:15  
**emphasis** 167:14  
**emphasize** 68:7 72:7  
166:17,22 171:10  
**emphasizing** 67:4  
234:15  
**employee** 314:19  
**empower** 50:12  
**emulsifier** 178:21 179:5  
**enable** 311:13  
**enclosure** 12:21  
**encounter** 27:22 32:4,9  
**encourage** 7:12 8:1  
50:18 51:2 77:9 97:10  
197:3 207:2 214:14  
223:17 224:9 225:19  
294:1  
**encouraged** 51:14  
**encouragement** 40:1  
**endangered** 24:5  
**ended** 181:7  
**energy** 8:18 10:2,7,11  
329:17  
**energy-intensive** 9:20  
**enforce** 26:10 279:13  
**enforcement** 50:21,22  
51:17 52:4 64:5,10,13  
64:18 65:5,11,19  
74:20 82:4,7 279:17  
**enforcing** 279:20  
**engaged** 63:16  
**engagement** 266:4  
**engages** 78:4  
**engineering** 275:6  
**enjoyed** 328:11  
**ENO** 77:15,16  
**ensure** 75:16,21 76:21  
163:14 167:8 311:19  
313:3 324:14  
**entail** 223:5  
**entire** 51:18 62:18  
67:10 70:22  
**entirety** 299:21  
**entities** 43:10  
**entrepreneur** 197:22  
**entrepreneurial** 197:20  
**entrepreneurs** 192:5  
**entrusting** 36:14  
**entry** 61:5,5,11 63:7  
**environment** 36:13  
37:8 50:14 169:18  
270:7  
**environmental** 37:10  
126:14 164:21 167:5  
221:14,21  
**EPA** 165:13 169:9  
173:17  
**epolene** 300:17  
**equal** 60:10,11 312:16  
**equate** 33:4  
**equipment** 53:7 88:4  
158:20  
**equivalent** 171:9  
**esoteric** 323:13  
**especially** 17:1,6 49:11  
62:1 85:17,20 107:22  
119:13 120:12 173:14  
188:4 193:6 245:1,4  
247:16 256:13 330:4  
**essential** 86:1 95:10  
156:18 163:22 164:8  
164:18 165:19 166:18  
167:7 168:11 179:5  
183:15,17 184:5,5,6  
211:20  
**essentiality** 98:16  
122:4 179:10 182:17  
183:14 184:4 209:17  
**establish** 193:11 309:2  
**established** 312:14  
**establishes** 256:4  
**establishment** 311:12  
**esters** 296:22 303:11  
**estimation** 238:13  
**et** 293:17  
**ethanol** 296:17 303:8  
**ethylene** 297:1  
**Europe** 97:5 186:13,14  
186:19 187:3 213:18  
**European** 12:2 213:19  
**evaluated** 244:15  
**evaluation** 104:12  
124:16 136:14 251:18  
**event** 289:14 320:5,14  
**events** 297:16  
**eventually** 14:7 25:5  
**everybody** 5:16 66:19  
**everyone's** 220:19  
**evidence** 130:11  
204:13 272:21 308:16  
**evolution** 270:4  
**evolved** 304:9  
**evolves** 252:3  
**evolving** 261:20 263:12  
268:17 269:22 270:18  
278:4 280:7 281:8  
**exact** 257:13 294:22  
**exactly** 193:14 205:17  
218:7 249:1 253:19  
**example** 53:18 75:13  
76:4 82:14 109:20  
144:7 206:20 236:9  
253:3 256:21 278:2  
311:19  
**exceed** 88:6 162:22  
**excellent** 42:17 52:2  
323:16  
**exchange** 238:6 247:1  
**excited** 10:4  
**exclude** 254:5 271:11  
**excluded** 4:9 39:17  
40:6 44:4 46:5,18  
49:17 50:8 55:3 74:11  
208:8 243:8,9,14  
244:7,11,17 257:13  
258:6,10 269:10  
273:22 274:13,16,21  
283:1 303:21  
**excluding** 257:5  
**exclusions** 39:22  
**exclusively** 199:7  
**Excuse** 292:10  
**execution** 330:8  
**executive** 64:1 230:4  
232:18 240:2 298:12  
324:10 325:4  
**exempt** 40:20,22 41:2  
41:17 44:4 46:4,19,20  
**exempt-excluded**  
45:13  
**exempted** 54:11  
**exercise** 262:16  
**exerting** 311:4,5  
**exist** 25:16 198:19  
234:8  
**existing** 40:2  
**exists** 35:21  
**expect** 27:21 80:21  
265:2  
**expectation** 33:2  
**expectations** 310:16  
**expected** 32:9  
**expecting** 224:22  
**expense** 29:5  
**experience** 128:1,11  
131:12 222:14 305:21  
328:14,17  
**expert** 256:22 273:8  
**expertise** 198:20 271:6  
280:17 305:21  
**experts** 247:15 249:11  
249:12 256:10 260:17  
270:12 276:13,19  
277:21 280:10  
**explain** 120:11 143:15  
232:19 256:11 257:1  
**explicitly** 114:7 117:11  
**exploding** 248:21  
**explore** 222:19 297:9  
297:20  
**explored** 40:5 234:13  
**exploring** 36:8 230:19  
259:19  
**Expo** 64:2  
**export-import** 60:10  
**exports** 60:4  
**express** 311:21  
**expressed** 26:12 29:8  
212:9  
**expressing** 59:13  
**extended** 23:11  
**extends** 73:1  
**extension** 236:5  
**extensive** 211:11

251:17  
**extent** 35:20 223:6  
**external** 103:22 108:7  
 131:16 235:22 236:13  
 236:18  
**extracted** 132:12 211:5  
 211:7  
**extracting** 161:7 215:6  
**extraction** 156:19  
 294:10  
**extracts** 221:11  
**extremely** 150:16 193:6  
**eye** 67:15 127:1,6 137:1  
 137:11,14 138:4,17  
 138:19,22  
**eye-opener** 35:20  
**eyes** 34:4 129:6 130:5  
 130:14 138:10

---

**F**


---

**fabric** 15:14  
**fabulous** 326:19  
**face-to-face** 67:7  
**facilities** 88:3 165:17  
 170:18 197:3,4  
 199:20 309:20  
**facility** 170:16 195:14  
 309:3  
**fact** 48:18  
**factor** 79:5 179:17  
**facts** 97:2 185:22  
**fails** 87:17 90:14 92:13  
 103:11 109:5 113:4  
 140:21 149:19 152:2  
 154:6 156:2 158:2  
 160:19 162:14 173:8  
 176:9 178:6 190:22  
 201:17 216:18 266:12  
 267:4 285:13  
**fair** 76:4 316:17  
**fairly** 5:10 13:4 27:11  
 45:7 211:11  
**fall** 1:5 37:5 53:2 150:14  
 153:1 222:4 253:9  
 275:12 301:13 317:10  
 318:3,5  
**familiar** 116:19 119:14  
 139:11 203:17  
**fan** 254:14 306:10  
**far** 27:20 48:19 52:10  
 72:15 73:1 75:8  
 119:20 163:17 171:8  
 179:14 196:11 220:5  
**farm** 24:7 28:20 37:9  
 43:8 119:7 131:22  
 295:11 303:19  
**farmer** 35:17 222:13  
 295:10 314:18 315:7

**farmers** 22:4 52:17  
 53:10,15,19 70:2 79:6  
 82:9 85:14,20 88:20  
 93:11 94:2,22 96:1  
 106:19 134:16 188:8  
 197:5 200:2 206:18  
 234:16 237:15 239:7  
 307:22 309:9 310:12  
 310:15 311:14 312:8  
 312:9,13,16 313:1  
**farming** 24:1 43:7  
 229:13 234:18 308:1  
**farms** 31:13 95:17  
 234:13  
**fast** 53:11  
**fast-track** 270:5  
**faster** 222:11 270:3  
**fat** 178:20  
**favor** 15:11 102:4 110:7  
 116:14 137:20 154:22  
 161:11 174:16 176:22  
 211:11 215:4 217:18  
 269:4 327:1  
**FBI** 73:5  
**FDA** 111:16,18 114:17  
 185:22  
**fear** 35:7  
**feathers** 125:13 128:9  
 133:10  
**February** 42:10 104:11  
**fed** 62:10  
**federal** 2:20 56:12  
 99:20 197:2 200:10  
 278:15,16  
**feed** 62:10 76:7 82:8  
 237:20 241:16 294:11  
 308:22  
**feedback** 42:6 83:9  
 222:6 297:18 299:2  
**feeding** 54:5 197:6  
 309:22  
**feel** 43:15,17 44:7 58:22  
 61:14 64:6 69:11  
 88:12 98:1 130:15  
 131:18 137:21 139:16  
 144:15 203:18 245:8  
 246:20 257:17 264:8  
 278:8,10 280:5,6,19  
 314:13 316:14,17  
 322:14  
**feeling** 249:8  
**feels** 104:18 246:10  
**felt** 9:5 94:16 114:20  
 180:9 196:10 239:2  
 255:16 257:22  
**female** 95:5  
**fenbendazole** 141:10  
**fermented** 150:22

**fever** 91:5  
**fewer** 163:17  
**fiber** 202:5  
**field** 3:2 6:21 7:3 13:6,9  
 13:18,18 14:19 28:18  
 248:20 260:19 269:22  
**fields** 316:6  
**Fifteen** 99:14 147:3  
 243:6 287:20  
**fifth** 234:20  
**figure** 30:5 31:1 37:16  
 59:17 70:11 298:4  
**fillings** 211:10  
**film** 235:5  
**films** 17:1  
**filter** 67:20 148:7  
 152:16  
**filtering** 150:7  
**final** 65:21 66:1,1 67:16  
 67:22 156:6 212:14  
 247:5 280:18 291:14  
**finalize** 289:13  
**finalized** 40:10 228:1  
**finalizes** 228:6  
**finally** 15:20 54:16  
 328:8  
**financially** 309:10  
**find** 13:10 21:13 23:8  
 23:15 81:18 97:12  
 114:11 123:14,18  
 133:12 167:14 181:5  
 185:15 194:5 197:17  
 206:12 215:5 230:17  
 232:18 235:13 264:18  
 310:7  
**finding** 213:1  
**fine** 246:19 259:2  
 279:10 285:15  
**fingers** 89:6  
**finish** 124:3 318:18  
**finished** 22:11 41:14  
 70:16 152:19 265:19  
 266:7  
**first** 5:15,17 6:20 11:21  
 22:21 30:3,8 33:9  
 34:11 43:18 47:9  
 48:14 49:1 53:3 54:6  
 62:17 83:22 84:18  
 93:6,17,18 99:21  
 102:9 128:22 142:3  
 142:14 143:1 147:22  
 191:13 202:12 222:6  
 229:3,6 246:19 288:8  
 291:21 299:18 303:1  
 307:6,14 313:22  
 317:14 319:20 320:18  
 327:12,14  
**firsthand** 128:1,11

**fish** 296:22  
**fit** 9:8 242:3 255:17  
 257:7  
**five** 60:10,12 101:14  
 110:13 112:2 153:2  
 211:15 238:14,15  
 244:14 285:13 296:1  
 305:15 307:13 315:6  
**fix** 47:10 50:11  
**fix-all** 185:16  
**fixes** 194:12,17  
**flag** 30:1  
**flash-freezing** 154:18  
**flat** 60:5 70:14  
**flavors** 300:15 301:7,12  
 301:17 302:3  
**flawless** 330:7  
**fleas** 125:9  
**flexibility** 250:3,14  
 251:2 262:8,11 278:3  
**floor** 105:7 115:10  
 126:5 146:5  
**Florida** 1:8,9 164:15  
**flour** 3:22 201:19 202:2  
 203:12 206:12 209:15  
 216:19  
**flow** 267:20  
**flowers** 205:3  
**flows** 71:19  
**fluid** 270:9 281:8  
**flux** 281:16  
**focus** 59:18 200:5  
 235:1 243:18 292:7  
**focused** 40:19  
**focuses** 29:9  
**focusing** 41:1 75:1  
**fold** 321:14 324:18  
**folks** 20:11 28:1 45:10  
 56:12 89:2 98:5  
 105:21 106:10 121:20  
 134:18 144:14 159:9  
 204:2 205:10 232:2  
 248:7 265:20,21  
 272:15 274:10 276:18  
 320:10  
**follow** 48:21 116:8  
 169:4 214:15 217:20  
 261:14  
**follow-up** 238:12  
 248:14  
**followed** 62:3  
**following** 61:19 98:13  
 122:2 142:11 209:15  
 220:21 265:16 318:10  
**follows** 284:11 324:9  
 325:4  
**food** 10:5,8 23:9,14  
 36:6 63:1 73:11 100:2

147:20 158:9,10,20  
 162:20 163:9,14,16  
 163:19 164:1,8 165:7  
 166:18 167:8,9 171:6  
 179:16 181:15 182:16  
 185:17 231:6 232:9  
 238:14 247:17 310:17  
 311:16,22  
**food-borne** 159:1  
**food-filtering** 152:10  
**foods** 98:13 122:2  
 154:18 161:6 178:12  
 183:19 187:18 202:6  
 209:16  
**foot** 104:9 105:21  
 106:19,20,22 107:5  
 108:1  
**foot-related** 104:10  
**footing** 312:16  
**footprint** 9:17  
**force** 289:17  
**foreign** 213:10 290:20  
**foresee** 25:12  
**forever** 54:15  
**forgot** 136:21 197:14  
 278:6 304:15  
**form** 114:16 115:13  
 116:5,11 130:19  
 133:20 205:7,11  
 208:7 214:18,22  
 224:8,9,20 225:18  
 246:1  
**formal** 228:1 236:18  
**format** 228:1 251:2  
**formed** 289:17  
**former** 314:18  
**forms** 4:2 208:13  
 210:22 212:3 214:13  
 225:4  
**forth** 72:11 282:14  
 291:7 300:6 303:2  
**forward** 7:14,16 36:11  
 42:11 43:16,18 44:8  
 45:15 50:12 54:17  
 79:1 144:1 173:20  
 174:20 189:11 204:13  
 220:3 223:3,3 225:15  
 227:3,6,10 246:13,20  
 247:6 254:3 259:11  
 260:11 268:8 276:20  
 277:2,3 283:20 290:5  
 298:20 300:5 301:21  
 303:6 309:2 315:19  
 315:21 328:22  
**forwarded** 226:15  
**FOS** 300:20  
**fouling** 182:22  
**found** 12:19 41:6 116:5

123:11,15 133:1  
 173:13 240:7  
**Foundation** 229:14  
 234:18 237:15  
**four** 60:6,12 100:12  
 101:2 150:15 210:16  
 244:13,15  
**Fourteen** 123:6  
**fourth** 317:21  
**fracked** 294:11  
**fracking** 292:20 293:14  
 295:10  
**fraction** 184:1 193:5  
**frame** 174:1 222:4  
**framing** 68:10  
**Francis** 1:18 6:16 22:12  
 47:13,15 52:11 53:13  
 96:9 101:18 106:11  
 107:21 111:2,12,22  
 112:7 116:13 117:14  
 120:3 136:20 138:14  
 140:3,22 151:8  
 167:16 181:16 186:11  
 188:9 218:22 255:1  
 281:1 295:19,19  
 299:8 304:16 305:8  
 305:12,13,15,19  
 306:4,6,18 313:5,7,10  
 313:11 314:6,11  
 315:2,2,5,12 316:1,4  
 316:11,22 317:3  
 320:20 321:18 328:9  
 328:12  
**Francis'** 321:21  
**frank** 59:1  
**fraud** 58:3 72:21 73:11  
 81:2 82:16 309:13  
**fraudulent** 40:9 62:1,6  
 81:14,15 309:7,12  
**free** 83:15 291:2 315:15  
**freezing** 161:6  
**frequent** 32:4  
**friend** 107:21  
**friendly** 40:3  
**friends** 194:21  
**fringe** 30:12  
**frog** 37:12  
**front** 19:21 34:2 35:1  
 45:5 249:1 302:12  
**fronts** 294:1  
**froze** 152:5  
**frozen** 156:19  
**Fructooligosacchari...**  
 300:22  
**fruit** 15:13 36:9 211:21  
 310:4  
**fruits** 211:5 214:6  
 309:17

**frustrating** 214:20  
**frustration** 191:22  
 193:16,21 194:2,3  
 195:4  
**FSMA** 159:3,9 171:15  
**full** 8:19 10:19 13:18  
 44:1 100:1 214:16  
 274:11 307:17  
**full-fledged** 79:14  
**fully** 180:2 208:6  
 274:10  
**fumigated** 63:11  
**fumigation** 63:10  
**functions** 86:8  
**fundamental** 266:6  
**funded** 238:4  
**funding** 198:7  
**fungi** 163:12  
**funny** 59:13 84:3  
**further** 10:17 27:8  
 34:17 41:18 43:6 47:3  
 48:10 49:20 54:21  
 56:7 73:18 79:11 80:5  
 80:7 91:12 93:13  
 96:18 111:5 120:19  
 150:11 202:16 205:21  
 207:19 219:21 220:8  
 220:10 232:12 246:10  
 246:11 253:16 260:19  
 267:14 268:10 274:12  
 275:21 276:3 277:7  
 289:2  
**fusion** 245:5,12 253:13  
 254:5,12 255:12,13  
 255:22 256:4 261:4  
 264:12,14 269:11  
 286:22  
**future** 185:12 196:2,6  
 207:10 232:5 235:1  
 235:14 259:20 268:11  
 298:18 313:3

## G

**gain** 312:16  
**gained** 22:7  
**gallery** 196:9  
**game** 77:2  
**gaps** 48:22 49:2  
**gardens** 22:8  
**garlic** 139:12,13  
**gas** 293:18,20 294:10  
 295:14 300:3  
**gathering** 290:12  
**GE** 209:9  
**gellan** 300:15  
**gelling** 202:10 211:9  
**gene** 243:19,21  
**general** 10:19 76:20

78:18,19 101:9  
 117:10 137:7 225:2  
 226:7 235:11 251:6  
 287:3 289:1  
**generally** 26:11 44:12  
 98:1 110:9 125:19  
 189:18 191:18 225:4  
 298:11 305:5  
**generation** 300:2  
**generic** 78:18  
**genes** 243:21  
**genetic** 243:15,17  
 244:1,6 252:14 253:4  
 257:15 261:12 275:6  
 289:9 291:1,3,3  
**genetically** 207:15  
 275:7  
**genetically-modified**  
 199:8  
**geneticists** 248:6  
**genetics** 118:7,8  
 261:18  
**gentleman** 316:14  
**Georgia** 133:16  
**germane** 233:7  
**germicidal** 85:4  
**getting** 16:9 19:14 56:6  
 61:14 71:13 74:4  
 86:16 93:22 128:12  
 168:20 200:14 230:20  
 240:4 241:2,21  
 264:19 276:16 300:6  
**gifts** 306:18  
**gist** 232:20 315:17  
**give** 5:13 21:19 24:1  
 26:16 28:8 52:19 60:6  
 63:1 75:11,13 97:22  
 98:2 115:22 152:5  
 196:3 220:15 245:15  
 254:20 305:8 311:9  
 323:15,18 324:3  
 329:13  
**given** 40:2 64:7,8 74:14  
 122:4 126:22 204:19  
 211:6 221:17 259:9  
 259:16 260:2 263:10  
 267:18 279:14 308:2  
**gives** 309:1  
**giving** 35:5 245:9 307:4  
**glad** 83:7 221:9  
**glance** 325:20  
**glasses** 123:11,12  
**Global** 43:5  
**glossy** 18:18 19:11  
**gluconate** 91:4  
**glucose** 3:7 90:16,19  
 91:15  
**glue** 307:9

**glycerides** 300:17  
**glycerine** 303:9  
**Glycolic** 303:3  
**GM-dependent** 199:14  
**GMO** 199:9,10 303:16  
**goal** 71:10 310:4  
**goals** 233:16  
**goats** 125:11  
**gold** 310:20 311:1  
**goods** 44:18 60:5,9  
 80:13 156:19  
**Google** 114:11  
**gorilla** 61:8  
**gosh** 265:22  
**gotten** 198:11 234:22  
 315:3,7  
**government** 78:13  
 310:9  
**governmental** 194:12  
**grab** 116:21 117:1  
**grade** 82:8 193:10  
**grades** 154:14  
**grain** 40:9 53:16,19,20  
 54:11 57:1 58:21 62:1  
 62:7 65:3 77:1 161:8  
 309:4,12  
**grain-growers** 62:7,15  
**grains** 53:17 199:8  
**grant** 241:1  
**grants** 231:7  
**grasses** 37:1  
**grate** 187:21  
**gravitated** 314:5  
**grazing** 106:19 126:2  
 308:18  
**greater** 44:19 79:19  
 126:16 134:4 223:18  
 237:9  
**greatly** 80:3  
**green** 10:20 309:1  
 318:13,14 319:2,2  
 321:13  
**greenhouse** 3:2 6:21  
 7:4 13:7  
**grip** 311:6  
**grocery-** 309:17  
**Gross** 74:1  
**ground** 12:21 13:19  
 24:11 32:13 35:3  
 61:10,12 68:13  
 105:22  
**group** 49:12 74:1,2,3  
 81:7 86:2 95:22 212:2  
 231:10 248:5 249:12  
 251:9 256:12 276:16  
 280:12,17 305:21  
 306:1  
**grouped** 172:10

**groups** 147:21 230:14  
**grow** 10:8 36:6 188:7  
**Growers** 294:15  
**growing** 10:5 14:10,11  
 14:15 66:18 262:4  
 307:20 308:3 309:16  
**grown** 202:4 311:22  
**growth** 67:12 78:9  
 194:8  
**grudge** 315:5  
**Guar** 301:2  
**guess** 9:3 12:22 21:10  
 58:18 59:7 61:16  
 127:7 189:8 192:14  
 199:2 205:4 220:21  
 236:8 245:18 248:17  
 259:5 263:18 266:6  
 269:8 274:6 275:20  
 291:6  
**guidance** 5:13 33:1  
 40:7 78:1 144:14,15  
 144:17,19 208:17  
 227:17,22 243:9  
 250:13 251:3,16  
 253:16 267:18 268:1  
 268:9,10 274:17  
 279:17  
**gum** 300:8,16,19 301:3  
**Gums** 301:2  
**Guo** 290:4

---

**H**


---

**hair** 125:13  
**half** 321:15 324:3,18  
**Hampshire** 35:18 36:3  
**hand** 6:16 22:18 33:19  
 50:16 63:19 64:12  
 65:9 84:7 107:19  
 124:6 329:14  
**handbook** 256:3  
**handle** 194:5 227:22  
**handled** 131:22  
**handler** 41:13 170:10  
 184:17  
**handlers** 44:13 71:1  
 163:15,17,17 171:14  
**handling** 3:14 4:1 81:12  
 147:10,11,16 148:1  
 170:17 195:6 223:12  
 225:13 228:14 234:8  
 298:1 299:13 302:12  
**hands** 188:3  
**hang** 249:15  
**happen** 63:8 189:6  
 196:1 268:5 281:9  
 311:3  
**happened** 6:12 110:6  
 247:1

**happening** 51:22 58:12  
 68:6 128:10 240:8  
**happens** 60:22 63:6  
 73:7 138:17 254:15  
 272:21  
**happy** 28:8 112:1  
 124:10 240:5  
**hard** 19:7 78:13 82:12  
 131:17 307:7 330:6  
**harder** 213:9  
**harm** 116:7 259:8,19  
**harmonies** 306:15  
**Harriet** 1:13 6:22 8:6  
 9:13 21:8 23:3,4 25:6  
 32:1,12 33:21 34:18  
 36:18 38:15 47:4  
 48:12 55:5 56:20  
 58:17 61:21 63:20  
 75:6,8 77:3 79:4 85:9  
 86:13,19 90:21 91:11  
 91:16 92:22 96:7,22  
 98:17 106:8 107:2  
 108:9 110:16 115:10  
 115:18 117:21 119:5  
 129:12 132:9 134:8  
 138:2 140:3 141:6  
 145:3,12,22 146:3,9  
 150:21 167:17 171:12  
 175:2 180:1 184:10  
 185:4 186:5,7 195:5  
 199:18 212:21 216:2  
 218:1 220:12 222:8  
 229:4,4 253:18  
 267:15 286:7 291:9  
 292:10 295:12 299:5  
 301:6 313:8 320:21  
 322:4 323:1,6 324:18  
 324:22 325:18 328:22  
**Harriet's** 18:10 116:2  
 321:14  
**Harriett** 291:4  
**harsh** 169:3  
**harvest** 14:10,16 220:6  
 222:14 234:5  
**harvested** 221:21  
 223:10  
**hat** 249:15  
**hate** 120:21  
**Hawaii** 203:12 204:9  
**hay** 37:3  
**head** 207:16 263:5  
 287:3  
**heading** 292:4  
**heads** 308:21  
**healing** 139:15  
**health** 89:5 126:14  
 133:9,11 137:8 159:2  
 164:9,13 165:6 166:1  
 167:4 179:9,14  
 183:16 234:10  
**hear** 28:3,6 44:3 52:3  
 123:4 132:6 164:8  
 170:5 194:2 205:21  
 239:21 240:8 294:9  
 298:18,19  
**heard** 17:7 42:20 43:13  
 44:11 57:16 129:5  
 192:17 193:8 200:1  
 202:14,17 205:4,19  
 281:13  
**hearing** 9:4 66:9,11  
 70:2 98:2 252:18  
 270:16 305:19  
**heart** 235:15 279:8  
**heating** 16:21  
**held** 42:3  
**Hello** 229:5  
**help** 8:2 9:6 10:12  
 29:15 34:22 38:2  
 45:21 68:17 70:6  
 78:11 81:21 104:9  
 120:11 127:12 142:20  
 173:22 200:7 218:10  
 230:19 233:16 247:13  
 247:20 248:6 249:9  
 249:16 250:11 256:11  
 256:19 260:18 268:2  
 271:7 330:12  
**helped** 26:1  
**helpful** 12:12 68:22  
 116:3 169:15 173:13  
 219:21 232:18 240:6  
 240:7 241:3 246:4  
 248:3 252:6 253:5  
 262:16  
**helping** 257:1 276:13  
 328:1  
**helps** 78:16 188:6  
 213:13 258:6 324:13  
**hen** 128:17  
**herbs** 94:6  
**herd** 95:19 118:5 139:8  
**herds** 118:9  
**hesitant** 263:14  
**hesitation** 273:5  
**Hey** 188:20 198:3  
**Hi** 50:17  
**hick** 19:20  
**hierarchical** 143:4  
**hierarchy** 142:12 145:6  
**high** 53:21 168:16  
 179:6 212:3 214:4,10  
 215:16  
**higher** 236:9 239:3  
 312:4  
**highest** 165:9

**highlighted** 180:16  
**highly** 58:7 77:8  
**hinge** 115:20  
**historical** 272:22  
**history** 274:11  
**hit** 98:7  
**hold** 244:5 254:21  
 315:5 317:6  
**holds** 307:9  
**hole** 53:11 54:15  
 313:15  
**hole's** 54:14  
**holistic** 316:8  
**home** 98:7  
**homeopathics** 94:5  
**honestly** 15:14 69:13  
**honey** 73:4  
**honey-laundering** 73:3  
**hoo** 323:12,12  
**hoof-related** 104:15  
**hope** 26:15 94:12  
 106:16 166:11 170:14  
 185:11 192:13 252:11  
 268:5 296:3,3 307:2,3  
 312:15  
**hoped** 310:21  
**hopefully** 145:2 166:4  
**hopes** 311:22  
**hoping** 48:22 120:18  
 159:7 213:8 218:2  
**Horizon** 96:11  
**hormone** 93:3 94:17  
 95:3,4,6 96:17  
**hormones** 95:8  
**horns** 109:21 113:19  
**hospitals** 165:15  
**Hotel** 1:9  
**hour** 147:9 270:17  
**hours** 13:13 251:9  
**house** 131:18  
**households** 187:10  
**houses** 128:2 133:5,6  
 134:6  
**How's** 186:15  
**huddle** 254:21  
**huge** 32:17 45:3 53:16  
 61:6 170:16 183:18  
 194:6 251:12 294:9  
 309:19 329:13  
**human** 89:4 126:13  
 167:4 179:9,14 244:6  
 257:15  
**humanely** 109:21  
 113:19  
**humans** 24:2  
**hundred** 52:21  
**hundreds** 198:17  
**hurt** 254:9

**hurting** 52:16  
**hurts** 127:19  
**hybridization** 244:7  
**hydrated** 296:22 303:10  
**hydroponic** 7:19 11:7  
 169:19 309:21 310:5  
**hydroponically** 309:18  
**hydroponics** 5:20 6:6  
 206:20 296:11 297:6  
 297:8 309:20  
**hydroxide** 300:17  
**hypocalcemia** 95:14  
**hypochloride** 88:10  
**hypochlorite** 3:6,7,19  
 3:19 88:9 163:3,4  
**hypochlorous** 3:12  
 136:2,4,6 139:1 140:2

---

**I**


---

**ice** 315:7,8  
**idea** 40:14 96:16 116:6  
 129:16 236:3 239:14  
 251:7 252:4,5 265:14  
 297:7 310:18 322:2  
**ideal** 222:3  
**ideas** 29:8 74:4  
**identified** 189:16 282:9  
**identify** 27:16 41:10,12  
**identifying** 41:11  
**IFOAM** 27:10  
**ii** 98:15  
**iii** 98:15  
**illegal** 73:4  
**illustrated** 234:9  
**image** 308:13  
**imagine** 279:19  
**immediately** 103:17  
 253:9  
**impact** 44:12,16 49:19  
 69:6 70:9 77:6,10  
 78:2 126:13,20 133:9  
 134:4 221:14,21  
 305:19  
**impacts** 44:11 75:8,12  
 133:4 165:6,22 166:1  
 167:3 179:9 212:4  
 234:11 295:11  
**impede** 260:1  
**implement** 237:2 260:4  
**implementation** 44:1  
**implemented** 143:13  
**implications** 166:6  
 183:16  
**implying** 60:19  
**import** 49:7 51:12 75:2  
 80:11  
**importance** 77:12  
**important** 5:11 9:14

16:12 23:22 43:17  
 48:14 51:20 63:2,15  
 68:7,10,15 69:3 70:18  
 77:14 80:18 82:19  
 85:11 97:21 110:17  
 111:4 131:9 134:11  
 138:16 164:9 165:18  
 165:20 168:3 169:2  
 170:5,8 207:9 223:14  
 234:16 252:13 307:12  
 328:3  
**imported** 58:6 62:1,6  
**importers** 43:11  
**imports** 40:12 49:6,10  
 50:4,5,22 51:8,18  
 56:3 58:21 60:9,11  
 73:4 74:12,14 75:1  
 82:6 292:3 309:12  
**impossible** 181:11  
**impressed** 96:10  
**impression** 297:4  
**improve** 71:7 144:22  
 166:5 237:1  
**improved** 69:9 80:3  
**improvement** 310:22  
**improvements** 72:5  
**improving** 238:17  
**impurities** 148:9 150:8  
**in-** 12:20  
**in-depth** 192:9  
**in-food** 221:4  
**in-the-ground** 14:5  
**inability** 203:11  
**incentive** 3:3 22:22  
**include** 41:3 120:10  
 172:3 183:22 220:22  
 222:7 246:4 247:10  
 253:13,16 254:11  
 265:22 273:5  
**included** 230:3,5  
 269:11 270:2 320:7  
**includes** 245:12  
**including** 43:10 96:13  
 125:20 262:20 290:7  
 307:21  
**incoming** 318:7  
**incompleteness** 280:6  
**incorporate** 26:16  
**incorporated** 17:8  
 124:13  
**incorporating** 17:10,13  
 17:16  
**incorrect** 273:15  
**incorrectly** 46:4,14,17  
 47:1  
**increase** 32:19 61:1  
 238:21  
**increased** 66:15,15

169:16  
**increasing** 67:9  
**increasingly** 311:4,5  
**incredibly** 68:9,15  
**independent** 189:12  
**indicate** 297:8  
**indicated** 50:20  
**indicates** 137:13  
**indicating** 203:6  
**indicator** 78:9  
**indicators** 78:11  
**indirect** 158:9  
**individual** 85:14  
**indoor** 169:16  
**industrial-** 309:19  
**industrially** 21:4  
**industries** 150:8,17  
**industry** 51:6,10 53:17  
 66:18 67:12 71:17  
 73:1 89:1 152:18  
 192:12 194:17 212:8  
 225:19 294:10 307:19  
 308:5,9 309:21 311:7  
 311:9 312:17,21  
 313:15  
**infection** 138:18  
**infestation** 131:7  
**infinites** 241:20  
**influence** 307:20,22  
 310:8 311:2  
**info** 148:12  
**inform** 10:12 69:15  
 248:6  
**information** 10:10  
 11:19 65:4 80:1  
 127:11 173:22 186:13  
 196:3 202:16,21  
 205:18 207:7,20  
 252:19,21 300:7  
 327:22  
**infrastructure** 293:19  
 293:20 295:14  
**ingredient** 41:4,10  
 80:17 91:4 179:17  
 183:3 202:15,19  
 212:6 213:20  
**ingredients** 80:21  
 119:12 147:18,20  
 191:12 198:18 203:10  
 221:5  
**inherently** 171:18  
**initial** 56:16 268:20  
 277:22  
**initiative** 36:5 240:18  
**initiatives** 79:1  
**ink** 19:19  
**inks** 18:18,19 19:10  
 21:5

**Innovacyn** 136:5  
**input** 17:10 42:14 63:9  
 83:9 98:6 143:20  
 202:13 211:16 221:5  
 222:21 223:9 265:18  
 294:3  
**inputs** 223:5,12 293:16  
 293:16 303:19  
**inroads** 28:15  
**insecticide** 125:6  
**inserts** 20:18  
**inside** 180:9  
**insight** 69:19 115:22  
 173:17  
**insightful** 169:15  
**insights** 305:20  
**inspect** 31:14 130:21  
**inspected** 33:19  
**inspection** 29:9 30:8  
 32:11 309:1 312:3  
**inspections** 27:17 28:2  
 33:10 85:19 107:22  
 131:1  
**inspector** 30:7 31:18  
 34:4 292:7  
**inspector's** 16:7  
**inspectors** 27:15,19  
 28:17 29:2 31:11,21  
 32:3 33:2,17 34:7  
 43:3 48:16 141:21  
 292:6  
**install** 170:13  
**instance** 180:6 246:1  
**instances** 32:20  
**instant** 97:2  
**Institute** 126:17 231:6  
 232:9 247:17  
**instrument** 321:22  
**insurmountable** 171:19  
**intact** 30:19  
**integrated** 312:2  
**integrity** 4:10 43:5  
 44:20 62:5 74:13 75:2  
 77:11 80:18 82:4  
 205:11 289:7,9 291:1  
 303:18 311:19 313:3  
**intelligent** 70:6  
**intend** 63:15  
**intended** 25:10 100:11  
 109:12 113:11 204:21  
 258:13 259:18  
**intent** 39:21 250:20  
 254:4 259:13 290:15  
**intention** 25:15 253:14  
 254:11 262:1  
**intentionally** 165:4  
**interact** 181:1  
**interchangeable**

119:20  
**interchanged** 44:5  
**interest** 36:8 50:21  
 51:17 53:22 56:5 86:2  
 212:2 256:14 289:6  
 297:6  
**interested** 9:4 28:6  
 78:22 292:19  
**interesting** 10:3 133:2  
 156:20 213:3 214:11  
 220:16 235:21  
**interests** 312:11,12,21  
**internal** 131:16 243:21  
 257:11  
**internalized** 302:15  
**internally** 293:12  
**international** 43:2  
 51:11 74:16 124:13  
**internationally** 30:17  
 51:19 73:6  
**internet** 275:11  
**interpretation** 42:2,7,12  
 144:18  
**interpreted** 192:18  
**interval** 60:9 111:8,8  
**intervention** 253:7  
**intestinal** 199:11  
**intestines** 191:14  
**intragenesis** 244:10  
 255:9  
**introduce** 124:8,10  
**introduction** 87:22  
 141:5  
**invested** 329:17  
**investigated** 181:6  
**investigation** 308:20  
**investigations** 65:14  
 67:14  
**investigative** 308:17  
**invite** 239:14  
**inviting** 265:18,20,21  
 266:4 289:1  
**involve** 165:11  
**involved** 41:15 80:4  
 240:4  
**involvement** 315:20  
**iodine** 85:21  
**IOIA** 43:2  
**ironically** 273:5 284:20  
**irrelevant** 281:11  
**irrespective** 181:12  
**irritant** 127:1 130:15  
 167:5  
**irritations** 127:6  
**isolate** 179:17  
**isolated** 106:20 294:19  
**isopropanol** 296:18  
 303:8

**isothiocyanate** 296:4  
**issue** 7:15 8:14 19:15  
 21:2,6,8 23:18 37:22  
 40:9,12,17 43:1 49:8  
 58:21 61:22 68:1  
 72:22 73:11 74:20  
 78:22 101:7 105:13  
 116:17 127:4 132:6  
 133:11 145:5 165:20  
 168:3,20 185:17,19  
 185:20 209:1 220:6  
 256:5 269:12 279:7  
 288:11 289:18,18  
 290:12 292:2 293:14  
 294:8 295:4 297:6  
**issued** 15:8 66:13  
**issues** 8:3,3 16:20 19:4  
 19:5 42:21 57:15 65:3  
 65:21 79:12 80:2 94:8  
 95:14 106:7 114:20  
 115:20 189:18 199:11  
 209:2 223:19 227:11  
 259:3 270:14 296:12  
 303:19 312:17 315:17  
**issuing** 68:2  
**it'd** 239:21 265:11  
**itchy** 132:1  
**item** 8:7 18:7 51:8  
 72:13,16 91:6 146:2  
 173:14 183:17 189:3  
 189:5 193:7 195:21  
 196:7,11 197:14  
 208:6 226:8,17  
 229:17 235:20 243:7  
 244:16 266:19 288:4  
 297:9,13 299:6  
**items** 6:19 7:16 168:10  
 179:12 189:11 194:4  
 195:8,18 198:11  
 208:19 229:10,10  
 244:13,14,19 245:16  
 259:10 260:12 261:8  
 267:19,21 268:19  
 269:14 293:4  
**ivermectin** 141:12

---

**J**


---

**Jacksonville** 1:9,9  
**jams** 211:9,22  
**janitorial** 165:10  
**January** 313:18 315:10  
 318:10  
**Japan-based** 203:13  
**Jean** 111:14  
**jellies** 211:22  
**jello** 134:9  
**jelly** 133:17  
**JENNIFER** 2:18

**Jenny** 69:2 305:10  
 306:21 327:13  
**Jess** 283:13  
**Jesse** 1:12 102:14  
 104:6 105:6 108:8,11  
 135:4 175:15 318:12  
 321:15 324:18 325:19  
 325:21  
**jive** 130:11  
**Jo** 24:6 25:18  
**job** 34:7 70:12 325:15  
 329:14  
**Joelle** 1:16 12:7 91:19  
 148:4,22 150:4 151:6  
 152:13 153:9 160:3  
 166:14 167:19,21  
 170:19 172:12 182:19  
 183:12 260:15 261:10  
 263:21 267:14 269:16  
 281:4 284:10 326:6  
**Joelle's** 271:3  
**joke** 84:2  
**jokes** 84:3  
**Journal** 21:16,21 22:1  
**judge** 30:13  
**judgment** 31:19  
**juice** 213:7  
**juices** 152:16  
**July** 136:5  
**jump** 84:11 147:13  
 154:11  
**Jumping** 291:15  
**jumping-off** 11:21  
**justify** 23:12

---

**K**


---

**Kansas** 37:1  
**keep** 13:1 19:15 36:14  
 52:14 53:5 67:15  
 79:18 88:14 90:21  
 93:12 97:16 110:14  
 111:4 157:8 167:13  
 192:7 224:15,18  
 244:4 248:16 261:15  
 261:16,19 275:13  
 288:20 295:6  
**keeping** 102:4 142:7  
 252:4  
**kept** 93:21 101:11  
**ketosis** 91:3  
**key** 65:14  
**kill** 89:3 168:16  
**killing** 53:22  
**kinds** 11:14 204:6  
**kits** 187:14  
**knew** 7:18 35:22 244:3  
 245:2  
**knowing** 71:1 128:12

132:4 204:16 252:12  
263:16 278:3 282:8  
**knowledge** 22:7 33:3,5  
272:22 306:2 313:14  
**known** 57:14 59:8  
120:9 127:1 165:2,2  
176:19 207:21 253:6  
**konjac** 3:22 201:18  
202:2,7 203:12  
205:12 206:12 209:10  
209:14 216:19

## L

**label** 62:19 77:11 79:11  
79:13 96:18 188:6  
214:21 297:7,21  
310:11,15,19,20  
311:13,15,17  
**labeled** 41:3,22 147:19  
183:3 188:5 191:13  
**labeling** 41:2,6 297:22  
**labels** 41:10  
**laborious** 250:17  
**lack** 148:12 191:22  
227:17 259:18 309:6  
**lacking** 269:19  
**lactic** 212:17  
**lagged** 194:10  
**laid** 198:6  
**lameness** 104:16  
**land** 16:19 27:4 36:8,16  
52:21 106:16,17  
**land's** 29:21  
**Landis** 124:12  
**landscape** 13:21 31:16  
**language** 42:17 43:20  
143:15 230:13 244:3  
**lard** 133:19 134:9  
**large** 48:18 80:14 111:9  
182:6 184:20 187:7,8  
309:4  
**large-theory** 98:3  
**larger** 73:12 197:4  
236:6  
**largest** 94:10 98:5  
**latest** 249:5  
**Latin** 220:5,14 221:15  
**laudable** 69:5  
**laughed** 33:13  
**Laughter** 83:17 186:16  
237:5 238:10 259:1  
281:3 288:12 299:16  
299:19 304:17 317:1  
**laundry** 156:21  
**lavender** 15:3 16:6 86:4  
**law** 99:20  
**lawful** 99:22 100:5  
**layers** 77:17

**lead** 6:22 18:10 23:3  
111:14 134:2 234:4  
241:1 295:20 300:10  
**leader** 232:2 240:18  
**leadership** 6:13 232:10  
232:15 290:2 293:6  
297:17 316:8 328:19  
328:20  
**leading** 44:19  
**leads** 34:14 179:19  
**leaning** 263:18  
**learn** 72:4 239:6  
**learned** 70:20 97:6  
261:18 307:13,14,18  
**learning** 33:16 328:12  
**leave** 15:12 44:21  
239:17 245:18 258:22  
277:17  
**leavening** 156:12  
**leaves** 95:7  
**leaving** 116:7  
**lecithin** 301:3  
**led** 115:20  
**left** 11:20,20 313:19  
**legislation** 49:22  
**legislative** 49:18 50:11  
**lemon** 213:6  
**lemons** 213:5  
**lengthy** 76:6 230:13  
**lessen** 107:14  
**let's** 30:2 54:17 59:18  
77:21 83:21 84:10  
116:9 246:12 254:20  
281:2 299:9  
**letter** 120:8  
**letting** 117:8  
**level** 64:15 68:5 115:5  
169:5,8,21 197:8  
200:10 224:22 236:8  
236:15 256:20 257:15  
275:3 278:2 312:4  
**levels** 70:21,22 71:4  
83:2,4 88:5 162:21  
310:9  
**LEWIS** 2:14 173:11  
208:22 232:6 233:17  
239:17 240:21 246:8  
247:13 256:7,20  
262:7 268:13 270:8  
276:15 277:19 282:5  
289:22 293:2 327:13  
**liaison** 237:20  
**licensed** 99:22 100:6  
**lidocaine** 3:9 109:7,9  
109:16,20 112:6  
113:15,22 114:3  
115:2,13 116:15  
117:19,20 119:4,20

120:5  
**life** 24:4 54:4 166:3  
**lifelong** 165:22  
**lifestyle** 188:1  
**light** 7:8 8:17 10:6,11  
10:11,18,19,20 11:4  
11:17 12:4 13:9,12,16  
223:14 308:12  
**lighting** 9:15,22 10:1,21  
**liked** 93:15  
**lime** 213:6 296:21,22  
303:10  
**limes** 213:5  
**limit** 88:7 162:22 212:3  
**limitations** 207:1 234:5  
**limited** 13:12 59:21  
**limited-scope** 136:14  
**line** 62:17 79:18 219:20  
229:16 244:5 310:12  
**lines** 88:18 171:16  
183:1  
**link** 65:16 67:17 206:21  
**linkage** 238:6  
**linked** 17:15  
**linking** 69:13  
**Lipson's** 235:20  
**liquid** 296:22 309:22  
**Lisa** 1:15 2:12 10:15  
12:9 63:17 75:5 79:4  
87:1 105:7 147:10,10  
155:5,8 157:4 160:1  
161:18 173:11 175:12  
188:16 190:3 200:20  
253:22 260:10 271:14  
272:14 284:16 286:11  
299:14 301:5 302:10  
320:22 329:4  
**Lisa's** 11:12 72:8  
**list** 2:12 4:5,6 41:4  
67:18 84:16 86:10  
91:7 93:19 95:2 96:6  
96:20 98:14 101:15  
102:5 105:1 110:14  
111:4 119:8 124:15  
136:7 137:4,18,20,22  
138:6 142:21 153:4  
154:22 161:11 168:9  
170:9 174:17 175:1  
179:2 187:20 191:10  
196:4,14 198:12  
201:21 212:19 223:12  
224:16 227:1 244:11  
244:12 258:10 262:3  
269:15 296:14 304:22  
**listed** 5:8 114:12  
137:15 186:10 203:3  
214:10 225:3 235:3  
244:19 255:12 269:10

275:20 286:22 301:17  
**listened** 314:4  
**listing** 4:5 85:1 86:22  
88:2 90:19 92:18  
99:19 104:2 109:9  
113:8 114:8 125:15  
125:16,20 126:8,16  
147:22 150:2,12,19  
152:9 154:13 156:7  
158:8 161:2 162:18  
174:6 176:14 178:11  
191:14 199:17 214:12  
218:8,11,17 221:15  
224:19  
**listings** 206:2 230:6  
**lists** 224:18 241:22  
**lit** 176:20  
**literally** 281:9  
**little** 7:22 15:16 18:3  
19:20 26:8,16 31:5,12  
35:2,7 42:2 48:21  
64:12 65:8 101:9  
109:15 117:13 128:8  
144:12 181:19 185:5  
187:14 196:9 198:6  
200:9 205:20 213:9  
214:20 215:6,8  
222:13 229:19 230:1  
238:5 248:11 258:7  
260:12 261:3 280:20  
281:20  
**live** 271:9  
**livestock** 3:5,13 83:18  
83:19,21 84:6,10,14  
84:17 85:12 86:5  
88:16 91:7 97:7  
100:11 104:8,13,18  
104:21 105:11,13  
109:12 110:11 113:11  
118:6 124:5,18 125:3  
125:4,10 127:9 130:9  
134:10 137:5,14,16  
141:5,8 142:8 144:17  
145:20,21 147:6  
158:14 196:20 197:7  
197:9 200:2 235:6  
302:20,22 313:12  
**living** 7:20 249:3  
265:15 272:4 280:5  
280:14 282:2,6,10,17  
283:9,19 284:3,4  
303:20  
**loads** 63:10  
**local** 36:7 76:5 104:1  
108:8 109:10,16  
113:9,16 117:18  
**locally** 54:1  
**Locust** 301:2

**lodged** 207:16  
**logical** 299:3  
**long** 29:19 48:19 84:1  
 93:19 171:8 222:1  
 308:18  
**longer** 17:1 36:3 71:8,9  
 119:16 159:12  
**look** 7:12 8:1 12:1  
 16:22 28:17 30:4 40:1  
 42:10 71:2 73:16 89:5  
 97:11 119:12 127:14  
 138:17 145:10 167:2  
 170:6,9,14 173:18  
 184:4 185:16 195:9  
 197:22 204:17 220:3  
 221:11 226:3 276:12  
 289:17 292:6,8  
 293:10  
**looked** 8:12 18:9 82:8  
 111:15 142:11 181:6  
 195:10 205:9 207:22  
 250:14  
**looking** 7:21 9:9,10,20  
 11:8 12:3 16:7 20:12  
 21:17 23:11 29:6,12  
 29:13 30:13 31:13  
 35:13 58:13 67:2  
 74:11 79:10 89:7  
 107:9 110:5 117:17  
 142:14 143:2 154:20  
 168:7 171:15 173:20  
 194:14 204:12 220:15  
 221:2,13 225:11  
 251:3 253:21 256:19  
 256:19 268:1 272:6  
 273:18,19 283:14  
 290:5,18 292:20  
 293:14,15 297:7  
 315:19 328:22  
**looks** 60:2 77:16 78:5  
 121:8 139:19 142:9  
 143:7 172:5  
**loophole** 48:18  
**loopholes** 25:12,15  
 43:9 77:13  
**lose** 118:4 133:10  
 196:21 197:7 272:22  
 302:10  
**lost** 53:3 54:19 63:14  
 81:9 85:5 123:12  
**lot** 7:5,8 9:15,16,22  
 10:1 11:1 16:22 19:3  
 19:18 26:17 27:18  
 30:16 32:10,13 33:22  
 36:3 37:14 38:1 42:13  
 42:15 43:12,13 44:5  
 45:4 50:20 51:10 61:9  
 65:2 72:18,19,21 73:5

73:8,8,22 74:4 76:1,2  
 81:11 82:6,9 85:14  
 88:16 89:2,8 96:11  
 97:22 107:21 130:21  
 134:15 137:13 138:7  
 138:22 143:5,18  
 144:12,14,18 152:22  
 165:11,15,16 168:20  
 169:17 170:17 177:3  
 179:8 183:9 184:15  
 195:10 196:19 202:15  
 202:21 203:12,16  
 206:18 213:6 215:7,8  
 220:1 227:15 237:16  
 238:22 241:18 243:11  
 243:18,20 257:10  
 258:6 259:11 261:11  
 261:13,17 290:19  
 306:5 309:1 313:18  
 327:17  
**lots** 308:22  
**love** 37:13 56:11 241:20  
 279:12 329:12  
**low-methoxyl** 214:10  
**lower** 114:1 132:17  
 141:9  
**lowered** 141:15  
**luck** 138:12  
**luckily** 298:10  
**lumped** 19:6  
**lunch** 221:12 228:16  
**lungs** 127:19

---

**M**


---

**mac** 186:18 187:11  
**magnesium** 3:20 173:9  
 174:6,10 175:10  
 300:12,18  
**magnitude** 61:1  
**main** 19:4 127:2 231:7  
 269:12 272:5  
**maintain** 64:15 148:11  
 148:17 150:19 324:13  
**major** 304:5  
**majority** 23:18 24:13  
 114:19 271:11 284:13  
 310:3 318:2 319:21  
 319:22 320:5,6,8  
**maker** 205:14  
**making** 31:19 83:6  
 179:6 202:14 204:18  
 215:11 232:17 242:3  
 253:5 254:2 258:11  
 263:16 270:19 281:13  
 281:14 286:15  
**malaria** 164:14  
**male** 95:5  
**mammals** 95:5

**management** 94:3  
 104:8,15,20 138:7,16  
 142:14  
**Manager** 2:12  
**Managing** 54:5  
**mandating** 43:8,9  
**manipulation** 243:21  
 244:6 253:4 257:11  
 257:14,15  
**manner** 105:19  
**manual** 304:7 317:9  
 324:14  
**manually** 94:5  
**manufactured** 150:9  
**manufacturers** 179:4  
 211:21 213:10,18  
**manufacturing** 132:18  
 170:16  
**manure** 106:15 296:8  
**map** 37:16 161:6  
**March** 103:15 121:15  
 124:11 217:1 305:4  
**marine** 4:3 219:16  
 221:1 222:13 234:3  
 296:10 300:11  
**mark** 56:5 71:20 235:20  
 237:14  
**marker** 238:18  
**market** 75:16 78:8  
 183:11 192:5 193:19  
 195:16 198:13 214:7  
 218:11 310:5  
**marketed** 202:8  
**Marketing** 5:17  
**marketplace** 188:7  
**Markets** 198:10  
**Mars** 10:5  
**Marty** 83:16  
**mass** 67:3  
**material** 85:11 86:8  
 88:12 91:1 94:15  
 95:10 96:1 102:7,8  
 104:22 107:16 110:8  
 110:17 115:15 121:13  
 124:19 126:8 132:4  
 135:1 139:21 141:1  
 148:15 154:19 156:11  
 174:21 178:18 179:19  
 182:14,15 183:5  
 184:14,16,21 185:6  
 185:11 193:16 195:1  
 195:15 202:3 212:10  
 216:21 217:13 225:18  
 227:4 288:3 291:10  
 296:19  
**materials** 2:16 3:6,19  
 4:3,7 84:15 87:21  
 88:3 89:12,14,15

101:1 121:17 138:6  
 139:12 142:17 159:6  
 159:13,15 162:16,19  
 163:2,6,8,11,13,18,22  
 164:12 165:1,4 166:7  
 168:18 169:3,6,9  
 170:11 172:8,9  
 173:14 184:21 185:9  
 188:4 191:18 212:18  
 219:16 221:19 225:7  
 228:17 229:3,4,5  
 230:16 235:8 247:3  
 250:15 267:12 296:2  
 296:10 300:11,13  
 303:15 307:15  
**matter** 8:22 9:22 123:20  
 228:19 253:10 254:6  
 266:9 268:3 290:20  
 330:18  
**matters** 10:1 71:12,12  
**mature** 109:22  
**maximum** 88:6 162:22  
**mean** 8:13 13:18,20  
 15:4 17:12 20:18 21:1  
 21:20 30:8 37:15  
 56:15 59:16 62:12  
 66:22 75:19 106:18  
 121:2 186:19 197:21  
 218:9 223:7 231:14  
 231:15,19 237:22  
 238:13 241:8 246:8  
 250:1,3,5 255:15  
 258:20,21 261:17  
 262:8 263:11 264:8  
 264:16,18 267:2  
 272:10 276:2 278:19  
 280:3 294:6,8 316:13  
 321:10  
**meaning** 101:14 316:15  
**means** 208:11 284:21  
**meant** 274:14  
**measures** 16:16  
**meat** 76:5 183:15,17  
 184:6 192:12 194:4,9  
 194:16,20 198:1  
**meat-based** 213:21  
**meat-slaughtering**  
 168:15  
**meat-withdrawal** 100:9  
**mechanical** 142:15  
**medical** 84:21 136:8  
**medicine** 100:20  
 101:12  
**meet** 53:18 169:11  
 258:9 310:15  
**meeting** 1:5 22:18  
 53:22 88:13 177:3  
 239:15,19 248:7

254:8 256:9,21 258:1  
 259:20 260:13 261:2  
 264:6 266:19 290:1  
 290:16 297:17 308:18  
 318:3,5 329:11,15,18  
 329:19,22 330:7,15  
**meetings** 11:2 239:13  
 313:18 316:16 324:11  
 325:6,6  
**meld** 262:22  
**member** 4:14 69:20  
 191:6,8 305:16  
 313:13 317:17,18  
 319:14,19 324:10,12  
 325:4  
**members** 56:17 115:5  
 124:1,2 180:12  
 225:19 227:13 307:7  
 310:3 313:6 317:15  
 317:21 325:9 330:1  
**memory** 111:16 207:13  
**Mennonites** 108:1  
**mental** 59:15  
**mention** 93:7 133:16  
 197:14 295:9  
**mentioned** 8:16 32:12  
 66:17 71:15 93:15  
 133:18 137:3 173:15  
 205:12 209:8 229:14  
 234:1,19 240:3  
 258:13 292:1  
**mentioning** 51:5  
**mentor** 314:12,13  
**mentors** 314:3  
**mentorship** 316:1  
**message** 176:21  
**met** 1:8 40:21 257:19  
 258:5 274:20  
**metaphor** 306:16  
**metaphors** 306:10  
**methionine** 235:4  
**method** 183:1 225:8  
 243:14 244:17 251:18  
 257:6,13,13 258:10  
 266:18 272:9 281:12  
 283:1  
**methodologies** 262:15  
**methods** 4:9 208:8  
 225:9 243:8,9 244:6  
 244:11 248:21 250:10  
 251:15 258:5 262:5  
 265:17 266:1,2  
 269:10 271:11 273:22  
 274:13,17,21 281:19  
 303:21  
**methoxyl** 212:3 214:10  
 215:16  
**Mexico** 295:5

**mic** 297:10  
**Michelle** 2:10 123:14  
 159:20 275:10 307:9  
 314:22 317:5 329:4  
 330:5,8  
**micro-level** 200:9  
**microcrystalline** 297:1  
**microorganisms** 227:5  
**Midwest** 31:17 52:18  
 309:3  
**mild** 26:11  
**Miles** 64:3  
**milk** 62:11 91:5 94:10  
 96:15 100:11 111:11  
 118:1 178:22  
**milking** 111:8  
**million** 52:22 60:6,7  
 238:21  
**millions** 198:18  
**mimic** 8:19 12:5  
**mind** 13:1 36:15,22  
 49:6 73:2 80:19  
 194:10 237:10 261:15  
 261:20 278:21 280:20  
**minds** 75:10 288:21  
**mine** 19:21 62:18 199:4  
 231:20  
**mined** 132:14,20  
**mineral** 303:10  
**minimal** 44:12 129:10  
**minimizes** 105:19  
**mining** 150:9 152:21  
**Minnesota** 85:19  
**minor** 44:10 109:21  
 113:20 119:10 212:13  
**minute** 75:19  
**minutes** 123:10  
**mis-classified** 217:14  
**mis-listed** 177:4  
**missed** 306:1 314:21  
**missing** 123:18 126:22  
 130:16  
**mistakes** 34:10 227:12  
**misunderstood** 95:6  
**mite** 131:6 134:2  
**mites** 125:9 127:4  
 131:17 133:4,8,10,13  
 134:5,6,17  
**mitigate** 73:18  
**mitigating** 163:12  
**mitigation** 16:15  
**mix** 128:6  
**mixture** 139:11  
**mixup** 45:16  
**mochi** 205:14  
**mochi-based** 204:8  
**model** 316:19  
**modification** 243:16,17

252:14 272:8 291:3  
**modified** 207:15 275:7  
 277:9  
**molds** 163:12  
**molecular** 253:7  
**molluscicide** 296:6  
**MOM's** 75:15  
**moment** 5:6,12 254:21  
 306:6  
**money** 200:14 310:8  
**monies** 197:2  
**monitored** 171:7  
**monitoring** 19:15  
 325:13  
**mono** 300:17  
**Montana** 31:14 33:10  
 33:14  
**months** 85:21 252:12  
 254:8 260:1 280:8  
**morass** 220:20  
**morning** 5:3,5,15 7:1  
 38:21 50:17 59:12  
 84:5 297:15  
**MORTENSEN** 1:16 9:13  
 35:16 39:7 47:22  
 53:12 55:13 58:18  
 68:21 70:16 87:6 90:2  
 91:22 98:22 102:18  
 106:9 109:3 111:6,19  
 113:1 115:18 122:19  
 135:16 140:15 144:4  
 145:16 146:18 149:11  
 151:15 153:18 155:13  
 157:12 160:6 161:22  
 169:14 172:15 176:7  
 178:3 188:20 189:6  
 190:18 199:2 201:12  
 208:2 210:10 216:11  
 231:3,21 240:11  
 242:18 248:1,18  
 252:16 265:13 278:8  
 284:21 285:2 287:8  
 294:21 315:22 322:4  
 322:11  
**MOSA** 143:11  
**MOSES** 22:3  
**MOSSO** 1:16 12:8 39:5  
 47:20 55:11 87:4  
 89:22 91:20 99:12  
 103:8 109:1 112:21  
 122:17 135:14 140:13  
 146:16 148:5 149:9  
 150:5 151:13 152:14  
 153:16 155:11 157:10  
 160:4 162:12 166:15  
 170:20 173:5 176:5  
 178:1 180:14 183:13  
 190:16 201:10 210:8

216:9 219:5 242:16  
 260:16 261:11 263:22  
 264:16 267:10 269:17  
 281:5,22 284:19  
 287:6 326:7  
**motions** 224:19  
**mouthfeel** 181:19 183:8  
 186:9,15  
**move** 7:14 18:7 43:15  
 44:8 46:3 47:4 48:11  
 50:12 53:11 54:17,21  
 71:21 79:1 84:6  
 103:13 142:16 152:14  
 153:6 155:1 157:1  
 159:17 161:15 175:5  
 177:7 189:11 215:18  
 217:16 220:3 225:12  
 225:14 246:12 260:13  
 268:8 276:20 277:1  
 285:14 291:11 294:1  
 295:17 301:20 302:19  
 305:11 308:21 309:2  
 318:17 327:5,6  
**moved** 21:4 174:18  
 218:4  
**movement** 289:19  
 308:1  
**moves** 270:3  
**moving** 9:18 70:14  
 87:18 90:15 92:14  
 103:18 109:6 136:1  
 141:3 158:6 165:17  
 191:9 209:14 223:22  
 243:22 246:20 260:11  
 277:3 280:19 315:20  
**moxidectin** 141:10  
**muddy** 107:5  
**mulch** 14:2,12,14 22:5  
 235:5 296:10,20  
**mulches** 12:18 14:9  
 16:17  
**multiple** 17:2  
**music** 254:22 306:9,10  
 306:14  
**musical** 321:21  
**muster** 144:10

---

**N**

---

**name** 130:19 187:7,9  
 198:2 288:7 289:6  
 290:19 321:14,14  
 324:17  
**names** 187:8 220:14  
**narrow** 100:18  
**nasty** 129:21 130:4  
**natamycin** 296:5  
**national** 1:3 2:11,12,13  
 2:15,16,19 4:5,6 5:18

84:16 91:7 95:2 96:5  
96:20 98:14 105:1  
124:15 136:7 137:17  
138:6 142:21 154:22  
161:11 168:9 170:8  
174:17 175:1 179:2  
191:10 196:14 201:21  
212:19 227:1 231:5  
232:2,9 236:11,12,17  
240:14,17,22 245:14  
247:16 305:16 311:10  
328:3,21  
**nationally** 236:6  
**native** 3:4 23:1 24:16  
25:21 26:5,21 27:16  
29:11 30:6,19 31:15  
32:8 33:4 35:3 37:1  
292:11  
**natural** 12:5,6 28:16  
29:10 97:12 104:13  
107:10 132:20 142:17  
148:5 150:6 168:10  
168:17 169:9 170:21  
311:21  
**naturals** 168:7  
**nature** 171:11  
**NatureServe** 25:19  
**near** 171:8 279:7  
**Nebraska** 37:1  
**necessarily** 11:14 33:4  
119:11 168:8,14  
182:12 184:7 261:22  
264:4 265:1 273:7  
275:19 280:18  
**necessary** 101:11  
183:10 187:17 211:20  
319:19  
**necessity** 125:17  
126:13,17 182:14  
**need** 9:7,14,16 15:16  
16:1 25:20 26:9 31:18  
34:17 36:21 53:10  
64:15 65:1 69:6,8  
74:5 81:20 82:19  
95:14,19 97:7 98:2  
107:5 112:2 138:19  
139:5,17 159:15  
166:2,5,12,22 167:13  
167:20 168:15,22,22  
169:1,3,5,8 195:15  
196:4,12 197:2  
205:13,17 206:13  
215:7 231:3 234:22  
241:10 245:8,10,14  
246:20 249:2,17  
254:21 255:8 257:17  
266:20 270:19 271:4  
271:9,12 279:1 280:9

283:18 288:18 310:14  
321:5  
**needed** 49:16 53:8  
72:19 95:18 97:3  
181:2 244:3 253:2  
270:20 304:6  
**needing** 250:2  
**needs** 139:7 205:14  
208:11 250:9 253:6  
**negative** 23:19 44:12  
77:9,19 78:1  
**negatives** 86:12  
**neglected** 209:6  
**neighbor's** 21:17  
**never** 29:22 37:2 131:5  
131:21 253:14 261:18  
308:11  
**never-ending** 262:3  
**new** 18:19 33:20 35:3  
35:18 36:2 66:1 67:11  
103:21 166:22 195:22  
214:15 233:6,22  
248:21 250:15 258:4  
261:12,16 262:5  
268:18,19 290:2,3  
295:5 302:11 312:15  
318:8 327:4 328:19  
**Newly** 318:3  
**news** 261:17  
**newspaper** 18:8,16  
19:5 296:19  
**newspapers** 19:19,20  
19:20  
**newsprint** 21:13  
**nice** 229:18 314:9  
**NIFA** 232:9 239:13  
**night** 5:11 6:2 58:6  
**nine** 244:14 253:9  
**nitrogen** 3:17 152:4  
154:8,8,13,17 155:4  
**no-** 55:6  
**no-vote** 47:15 86:21  
89:19 91:18  
**NOC** 143:11  
**nodding** 287:4  
**NODPA** 96:13  
**nominate** 320:21 321:1  
323:3 325:21 326:2,7  
326:16  
**nominated** 317:17  
321:9  
**nomination** 323:6,6  
**nominations** 317:14  
319:6 320:18 322:21  
324:15 325:17 326:15  
**nominee** 319:20,21,22  
320:4,6,13,15 326:21  
**nominees** 320:7

**non-** 104:13 154:12  
156:6  
**non-agricultural**  
147:17 217:15  
**non-amidated** 4:2  
210:22 214:13 215:15  
**non-compliance** 15:7  
**non-contentious**  
148:14  
**non-fat** 178:21  
**Non-GMO** 4:10 208:5  
261:14 303:18  
**non-organic** 147:17  
205:6 213:20  
**non-organically** 191:11  
**non-regulatory** 50:13  
**non-retail** 41:20  
**non-substantive**  
253:12  
**non-synthetic** 217:22  
224:8,10,12,13,16,21  
225:3  
**non-synthetics** 150:1  
152:9  
**noodles** 202:6  
**Noonan's** 35:17  
**NOP** 32:22 42:3,4,9  
43:8 44:1,9 52:14  
59:1 65:17,18 68:15  
70:22 77:5 100:5  
136:16 144:8,10  
230:4 243:10 245:21  
256:5 278:19 289:17  
312:2,4 329:3  
**NOP's** 40:17  
**North** 294:8 295:5  
**Northeast** 36:1 94:18  
**NOSB** 2:10 6:14 40:11  
43:22 59:2 144:8  
174:22 175:8 208:17  
217:5 225:20 227:17  
242:8 268:10 289:16  
307:14,20,21 310:3  
311:5,9 317:15,17,18  
318:3,5,7 325:6,6,9  
325:10  
**notation** 254:2  
**note** 66:11 86:2 120:15  
123:11 131:9 133:15  
134:12 166:19 177:2  
188:12 189:19 319:9  
**noted** 42:8 65:16 85:11  
114:9 150:15 232:14  
233:15  
**notice** 66:4 186:12  
189:13 212:14  
**noticed** 126:21  
**notices** 15:8

**noting** 246:13  
**NOVEMBER** 1:7  
**nowadays** 19:18  
**NRC** 236:17  
**NRCS** 28:20 37:11  
**nuance** 213:17  
**nuances** 15:22  
**nucleus** 257:11,14,16  
**number** 13:13 42:21  
57:17 59:3 71:10  
114:3,17 214:9  
217:13 229:21 248:21  
288:10 294:7 320:1  
**nums** 109:18 113:18  
**numerous** 85:10 94:16  
142:5 143:11 145:4  
**nutrient** 17:18  
**nutritional** 185:21

---

**O**


---

**OAKLEY** 1:17 11:12  
20:3 24:22 25:8 32:1  
38:22 45:19 46:8 48:7  
55:20 79:3 87:13 90:9  
92:7 99:7 103:3  
108:18 111:21 112:16  
120:7 122:12 126:6  
126:19 131:21 135:9  
140:8 144:7 146:11  
149:4 151:22 154:3  
155:20 157:19 160:13  
162:7 166:9 172:22  
175:22 177:18 182:5  
184:11 190:11 201:5  
206:17 210:3 214:1  
216:4 221:8 223:2  
229:8 231:11 233:4  
233:21 237:3,6,13  
238:8,11 239:10,16  
240:10 242:4 243:3  
247:10 248:13 253:18  
254:13 260:6 265:6  
272:20 278:6 279:5  
284:2 285:9 287:15  
292:18 295:8 313:22  
318:20 321:3,6 323:1  
**obligatory** 308:19  
**obscure** 253:3  
**observing** 29:3  
**obstacles** 168:21  
**obtaining** 212:10 237:2  
**obtains** 320:4,6  
**obviously** 257:19  
270:13  
**occupation** 165:9  
**Occupational** 164:20  
**occupationally-** 165:9  
**occur** 208:19 304:22

320:3  
**occurred** 27:4  
**occurrence** 95:17,18  
**occurrences** 95:13  
**occurring** 64:19 262:10  
 270:11  
**occurs** 95:4  
**octanoate** 296:21  
 303:10  
**odd** 264:18  
**OEFFA** 143:12  
**OFARM** 74:1  
**off-label** 101:5,7  
**offer** 45:1 72:21 205:11  
**offered** 255:3 271:6  
**offering** 43:3 260:18  
**office** 319:4,6 320:15  
**officer** 4:16 317:4,9,11  
 317:16,22 319:13,18  
 322:20  
**officers** 318:1,4,7,8  
 319:10,17 325:10  
 327:4 330:11,14  
**official** 2:20 325:12  
**officially** 110:22 325:15  
 329:19  
**OFPA** 49:19  
**oftentimes** 194:2  
**Ohio** 294:6,13 295:1  
**OID** 206:2  
**OIG** 44:2 68:9  
**oil** 86:4 107:13 150:7,16  
 293:18,20 294:9  
 295:13 303:10  
**oil-free** 154:14  
**oils** 17:21 148:2 168:11  
**Oklahoma** 132:7 295:9  
**Omni** 1:9  
**on-** 240:15  
**on-farm** 170:17 181:20  
**on-site** 29:17  
**once** 79:10 92:22 139:3  
 143:22 147:6 291:17  
 317:20  
**oncoming** 330:13  
**one-page** 230:10  
**one-year** 318:2  
**ones** 81:17 143:14  
 234:22 248:12 271:18  
 276:22 277:2 323:14  
**ongoing** 65:14 191:21  
**online** 31:6 37:14 43:11  
**onset** 109:17 113:17  
**open** 7:11 38:9 45:1  
 58:22 59:6 95:8 96:8  
 105:7 115:10 125:22  
 126:2,5 138:1 144:2  
 146:5 148:6 150:9

183:6 185:6 202:22  
 207:4,9 237:9 245:18  
 267:17 277:17 289:4  
 294:2 305:7 319:6  
 320:17 325:13  
**opening** 192:14  
**opens** 185:8  
**operating** 66:14  
**operation** 16:11 40:20  
 40:21 67:19 81:8  
 95:12  
**operations** 6:9 32:18  
 39:18 40:6 41:15  
 43:21 46:18,20 49:17  
 50:9 55:3 67:1 71:8  
 74:11 80:12 104:17  
 126:1 164:1 205:10  
**operator** 35:10  
**operators** 35:1,8  
 142:20  
**opinion** 8:22 97:2  
 240:20 248:1 254:7  
 266:3 278:10 279:9  
**opportunities** 72:21  
 196:4 234:8  
**opportunity** 220:7  
 277:1 305:8  
**opposed** 250:13  
**opposite** 20:15  
**opposition** 110:9  
 150:14 264:19 269:18  
**option** 13:15 134:17  
 163:12 183:20 191:6  
 283:12  
**options** 35:5 127:20  
 137:9,13 163:18  
 185:12  
**oral** 99:22 125:22 212:9  
 220:2  
**orchards** 14:20  
**orchestra** 306:16  
**order** 5:4 64:14 99:22  
 100:6 141:18 146:4  
 167:8 195:18 196:4  
 196:13 229:1,2  
 266:10 284:12 286:13  
 291:18 318:17  
**OREI** 238:4  
**organic-compliant**  
 114:16  
**organically** 200:8  
**organically-** 115:12  
**organically-available**  
 192:11  
**organics** 79:5 116:19  
 185:16 237:19  
**organisms** 275:7  
**organization** 22:2

125:21 270:13 312:15  
**organizations** 96:12,14  
 98:3 202:16 230:9  
**organized** 312:8  
**organophosphates**  
 164:15  
**original** 121:12,18  
 158:12 221:16 271:18  
 275:18 310:12  
**originally** 49:6 120:2  
 251:1  
**originates** 298:21  
**OSPs** 203:4  
**OTA** 43:4 74:2,2 202:17  
**others'** 138:1  
**outcome** 69:9 70:18  
 265:2  
**outcomes** 69:11 70:9  
 70:10  
**outdated** 252:3  
**outdoor** 133:6  
**outdoors** 308:9 311:20  
**outgoing** 4:14 318:7  
 319:14,19 330:10  
**outline** 225:8  
**outpatient** 117:18  
**outraged** 81:3  
**outside** 129:9 171:18  
 203:21 308:14  
**outsized** 307:19  
**outweighs** 280:7  
**over-consume** 184:2  
**overall** 107:15 126:22  
 227:18 272:9  
**overcome** 26:14  
**overlap** 315:14  
**overnight** 281:10  
**overruled** 312:12  
**overseas** 53:19 213:3  
**oversee** 67:1  
**oversight** 40:12 223:19  
**overstate** 60:17  
**oxalic** 303:4  
**oxygen** 300:16  
**oxytocin** 3:8 92:15,18  
 93:1 95:1,3,10,17  
 98:12 103:13

---

**P**

---

**P-R-O-C-E-E-D-I-N-G-S**  
 5:1  
**p.m** 228:20,21 330:19  
**packaged** 41:9,19  
**packaging** 41:18  
 154:17 161:6  
**packed** 41:17  
**packets** 187:14  
**packing** 171:16

**page** 19:21 46:16 65:19  
 67:17 273:20  
**pails** 88:17  
**pain** 81:20 82:3  
**pair** 123:12  
**paired** 101:20  
**palm** 211:5  
**panel** 57:17 63:5 80:11  
 152:11 154:14 185:22  
 256:18  
**panels** 198:21 240:22  
 241:13  
**paper** 20:19 22:5  
 326:22  
**papers** 21:18  
**paperwork** 71:19  
**paragraph** 84:20 88:2  
 90:18 92:17 103:21  
 103:21 109:9 113:8  
 158:6,7 161:1 162:18  
**paramount** 77:11  
**parasite** 129:17  
**parasites** 131:16  
**parasiticide** 103:22  
 108:7 125:4 141:4,14  
 142:22  
**parasiticides** 3:13  
 141:22 142:2,10  
 145:9,19  
**pardon** 59:14  
**parentheses** 163:2  
**parsing** 193:5  
**part** 15:10 23:21 43:8  
 46:21 51:1 68:21  
 100:2,4 110:1 121:15  
 167:22 188:1 196:19  
 207:5 255:21 264:15  
 270:1 273:16 275:11  
 278:21 301:16 306:8  
**PARTICIPANT** 285:1  
 288:15 290:9 302:5,8  
 322:10 323:22  
**participates** 324:11  
 325:5  
**participation** 329:22  
**particle** 272:11  
**particular** 60:22 78:20  
 130:19  
**particularly** 67:7  
 229:11 306:6  
**partners** 91:8  
**partnerships** 28:22  
**parts** 42:1 256:14  
 328:20  
**parturition** 92:18  
**pass** 23:4 44:18 249:6  
 253:15 263:14 282:15  
 282:16 326:4,9

- passed** 6:3 77:5 154:20  
208:17 226:14 251:1  
263:9 271:18 273:19  
274:12,14 281:10  
282:18 318:13
- passes** 39:15 48:9 56:1  
99:14 123:7 135:22  
147:3 210:17 219:14  
287:21
- pasta** 202:9
- paste** 206:20
- pasture** 126:1,2 133:5  
308:22
- pastured** 76:5 133:2
- pastures** 133:8
- path** 222:20
- pathogen** 168:16
- pathogens** 89:3 159:2
- paths** 223:3
- PATTILLO** 2:16
- Paul** 2:14 231:16,17  
232:1 233:11 239:16  
256:5 262:6 282:3  
289:20 292:22 327:12
- Paul's** 231:14
- pause** 64:11
- pay** 63:3 80:20 238:1  
261:22
- paying** 81:1 218:3  
237:17 302:16 307:10
- payment** 52:22
- PCO** 143:12
- peanut** 196:9
- pectin** 4:2 192:19,20  
210:19,22 211:4,7,18  
213:2 214:3,10,17  
215:2,8,21
- peelings** 214:4
- peels** 215:8
- peer** 236:1 241:10,16
- peeves** 196:9
- pending** 126:16
- Penn** 10:4
- Pennsylvania** 294:22  
316:6
- people** 7:12 13:2,14  
21:13,15 24:8 26:12  
28:4 31:11 37:7 56:10  
61:9,12,13 81:6,21  
82:3 97:4,15 101:14  
115:21 118:6 127:10  
127:16 130:20 133:22  
138:12 167:11 171:4  
181:3 183:21 184:18  
185:16 187:9 203:14  
206:7 208:9 230:7,21  
241:5 243:15 244:22  
247:18 249:5 261:13  
271:16 280:9 290:11  
297:5 314:4 321:7  
328:9
- people's** 280:14 288:20
- pepper** 300:3
- perceive** 53:20
- percent** 31:2,5 59:18,19  
60:2,3 72:14,17  
105:15 199:9,10  
225:9 238:14,15  
239:4 309:22
- percentage** 32:18  
309:16
- perennial** 15:3,11
- perfect** 252:12 321:5
- perform** 115:14 236:12
- performing** 119:10
- period** 23:12 26:7 60:14  
100:9,12 109:11  
110:3,21 113:10  
114:2 290:14
- perishable** 193:7
- permanent** 15:6
- peroxyhydrate** 296:18
- person** 57:7,7 70:1 79:9  
112:3 133:2 240:17  
249:21
- personal** 52:15,19  
184:2 206:19
- personally** 171:22  
181:3 183:18 195:2  
199:13 263:14 295:10
- perspective** 10:18 11:9  
51:22 75:12 105:12  
132:4 166:18 167:14  
170:10 171:7 194:18  
220:5 259:14 264:17  
264:21 265:3 314:17
- perspectives** 280:15
- pest** 61:4,5 161:8
- pesticide** 125:8 236:10
- pesticides** 58:10  
126:11 164:6,7  
165:21 209:10 214:5
- pet** 129:2 196:9
- petition** 107:8 124:10  
124:10,13 125:2  
128:9 135:2 136:3,6  
136:11,16 140:1,4  
191:7 225:20 299:18  
301:13 307:15
- petitioned** 3:11,12  
135:3 136:22 137:8  
198:13 296:2 301:11
- petitioner** 195:20 300:6
- petitions** 167:1 299:18  
300:4 302:12 303:1
- petroleum** 133:17
- pH** 156:20
- Ph.D** 2:12,14,18
- phenomenal** 305:20  
329:6
- phone** 59:4 316:2,16
- phosphate** 179:16  
180:5 182:7,21
- phosphates** 3:21 178:8  
178:11,16 180:18,22  
188:15 190:3
- phosphoric** 178:19  
300:18 303:9
- phrase** 141:16
- physical** 85:4
- pick** 50:7 129:2 321:15
- picking** 134:3
- picture** 19:21
- pictures** 11:2 308:15
- pie** 308:6,6
- piece** 236:21 290:10  
308:5
- pieces** 326:21
- Pingree** 238:19
- pink** 137:1,11,14 138:4  
138:17 319:3 326:21
- pipelines** 295:14
- pit** 106:15
- place** 23:9 32:11,14  
69:10 76:1,2 77:10  
97:9 141:8 143:1  
237:8 264:7 271:2  
329:5
- placement** 196:13
- places** 46:14 64:2 142:6  
168:17
- plan** 29:19 31:1,3 32:15  
34:1,6,6,22 35:10  
40:13 74:6 81:3  
174:19 198:6 247:8  
312:3
- planet** 24:2
- planned** 40:16
- planning** 45:10
- plans** 127:10 309:2
- plant** 24:4 125:6,7  
148:1 168:15 181:20  
196:21 208:3 221:11  
222:16
- plant's** 17:11
- plant-based** 19:1
- plants** 11:4 132:16  
169:17 182:22
- plaque** 305:6,13
- plastic** 296:19
- play** 57:1 208:5 233:20  
321:21 322:5
- played** 322:10
- player** 306:7,7
- players** 19:9,10 72:2
- plays** 36:16 327:21
- please** 77:18 226:10  
321:13 324:17
- pleased** 312:7
- plowed** 37:2
- plucking** 243:19
- plurality** 320:9
- point** 11:21 20:3 29:7  
30:10 32:22 46:13,16  
49:22 57:21 59:10  
69:15 74:7 77:18 78:3  
101:19 120:14 134:2  
143:17 146:4 167:7  
172:2 183:3 185:15  
188:20,21 191:3  
199:19 204:19 207:3  
212:13 213:18 221:14  
221:18 252:16 260:19  
266:14 268:6,20  
270:8,15 271:18  
272:5 273:3 277:22  
310:10
- pointed** 27:9 100:18
- points** 250:2,4
- policies** 312:14 323:20  
324:13
- policy** 239:1 256:5  
304:4 312:11 317:8  
324:12
- Polyoxin** 296:4
- ponder** 260:16
- ponds** 37:13
- Pooler** 54:9
- population** 261:21
- populations** 203:11,21
- porches** 76:16
- port** 61:5,11 63:6
- portable** 187:13
- portion** 5:8 282:2  
291:10
- ports** 43:21 73:20  
73:21
- ports** 43:10
- posed** 212:1
- position** 281:15 314:1  
317:16,22 320:18
- positions** 317:10,11  
318:4
- positive** 77:21 234:13
- possibility** 18:9 25:4  
292:20
- possible** 8:20 223:3,18  
224:3 282:4
- possibly** 233:1 261:2
- post** 66:10 67:22 92:18  
219:21
- post-birthing** 94:4

- post-parturition** 93:4  
**posted** 65:22 66:2,5,7  
 219:19  
**potassium** 3:20 4:3  
 176:10,14,18 177:9  
 189:14 217:9 218:16  
 296:20 297:2 300:16  
 300:19  
**potential** 209:9 218:10  
 234:11  
**potentially** 81:9 166:1  
 182:7 184:20 297:6  
**poultry** 53:17 126:1,3  
 131:17 133:2 134:12  
 134:13,16  
**pounds** 198:18  
**powder** 125:12 130:18  
 194:15 235:8  
**powders** 148:8  
**practical** 35:11 172:4  
 221:16,22  
**practice** 14:19 225:2  
**practices** 27:4 37:5,8  
 104:20 126:12  
**prairie** 37:1  
**pre-grated** 187:22  
**precautionary** 182:9  
**precipitated** 141:11  
**prefer** 85:20 233:9  
**preferable** 258:16  
**preference** 266:15  
**preferred** 88:21 168:18  
**preliminary** 56:3  
**premium** 80:20  
**prepare** 319:7  
**prepared** 124:17 272:4  
**preparing** 232:20  
**preps** 211:21  
**prescriptive** 277:16  
**presence** 212:16  
 316:13  
**present** 1:11 2:9 74:21  
 115:13 152:19 188:5  
 239:20 278:14  
**presentation** 59:12  
 304:13 305:6,13  
**presented** 282:6,10  
 294:6 305:14  
**presenting** 77:16  
 207:11  
**preserves** 211:10  
**presiding** 1:10  
**pressure** 213:9  
**pretty** 21:1 26:11 36:19  
 88:14 129:10 134:6  
 137:21 148:14 165:5  
 171:3 177:1 217:19  
 217:21 235:3 244:21  
 257:4,20 263:12  
 295:15  
**prevent** 104:9 138:20  
 139:1 143:2 178:19  
 182:22 183:7  
**preventative** 131:4,6  
**preventing** 16:16  
 142:16 192:4  
**preview** 74:8  
**previous** 136:10,18  
 189:15 230:6 244:12  
 273:13 279:15 288:22  
 293:9  
**previously** 124:19  
 135:1 136:10,17  
 139:22 276:22  
**price** 44:18  
**prices** 53:1  
**primarily** 182:16 202:4  
 204:9 211:20 221:13  
**primary** 28:13 134:12  
 202:19 211:15 324:9  
 325:3  
**principle** 182:9 185:2  
**principles** 20:9 274:14  
**prior** 32:11 121:17  
 150:12 269:19  
**priorities** 4:9 229:7,20  
 230:22 233:22 234:21  
 235:2 242:9 284:4  
**priority** 65:15 107:10  
 233:6,14  
**private** 198:8  
**probably** 11:17 19:13  
 21:2 24:9 25:20 28:12  
 29:18 32:2,16 33:20  
 37:5 74:8,19 80:12  
 82:9 97:16 106:14  
 116:6 143:7 144:16  
 165:13 184:15 199:16  
 222:2 223:5 231:22  
 233:2 238:2 250:11  
 254:6 261:13 266:14  
 277:21 303:5 306:5  
 314:3 316:2 319:11  
**problem** 34:9 53:5  
 59:18,20 60:3,3,4,15  
 60:16,19 61:3,15 70:4  
 74:16,17 76:14 81:22  
 106:20 139:5,7  
 142:16 143:1,3  
**problematic** 19:1  
**problems** 94:4 129:5  
 198:9  
**procaine** 3:10 113:6,9  
 113:16 114:4,10,11  
 114:17 116:20,21  
 117:1 119:3,3,8,12,20  
 121:15 122:1  
**procedural** 284:11  
**procedure** 304:8  
**procedures** 64:10 65:1  
 85:2,22 236:14 317:8  
 317:9 323:21 324:14  
**proceed** 146:8 189:22  
 227:14,16 266:22  
 268:15,22 293:7  
**process** 64:22 69:3,15  
 70:18 76:7 101:1,21  
 110:2 132:18 165:14  
 167:22 197:17 208:1  
 208:21 224:6 226:12  
 228:5 236:1 241:2,19  
 245:20 247:3 250:17  
 264:17,20 265:3  
 268:11 269:18 271:3  
 274:22 282:1 307:14  
 310:21 317:14 320:4  
 328:7  
**processed** 41:19 58:7  
 147:19 182:1,16  
 183:19 184:21 187:15  
 191:13,14  
**processors** 83:3  
**processes** 203:16  
**processing** 142:13  
 148:1 152:20 158:19  
 158:20 161:8 165:8  
 181:20 182:22 187:20  
 195:14 196:21 197:3  
 197:4,8 198:12  
**processors** 171:20  
**produce** 49:12,13 51:6  
 51:10 81:6 161:9  
 185:9 212:11  
**produced** 61:13 62:9  
 152:21 191:11 208:8  
 213:7 244:17 293:17  
 309:18  
**producer** 118:2 119:2,3  
 130:4 208:11  
**producers** 91:2 94:2,19  
 95:8 97:11,22 104:21  
 117:9 120:12 125:21  
 128:2,13,20 131:3,13  
 137:9 138:3 141:20  
 143:15 185:8 211:19  
**producing** 128:17  
 204:3  
**product** 41:2,6,9,14,22  
 57:2 58:6 63:13 75:17  
 76:3,9 80:13,15 85:15  
 96:20 128:14 131:2,8  
 132:20 133:17 137:8  
 152:20 179:7 181:2  
 181:15 182:3,11  
 195:16 203:15 205:6  
 206:6 208:6 212:12  
 217:17 218:9 245:5  
**production** 3:2,4,13 6:4  
 6:7,21 7:4,22 8:5 9:11  
 9:21 13:7,18 14:4,5  
 15:18 16:13 17:7 23:2  
 23:10,14 84:17 85:12  
 86:6 88:17 95:11 97:8  
 98:14 118:7,11  
 119:17 122:2 125:3,5  
 128:16 141:5 142:6  
 145:20 169:17 174:11  
 179:5 209:16 213:2  
 213:13 225:8,9 234:4  
 244:8 309:22 310:1  
**products** 41:16,17  
 82:11 104:14 114:12  
 114:18 120:10 138:21  
 138:22 139:4,10  
 147:19 152:17 165:11  
 183:10,11 184:19  
 185:7 187:1,2,5 188:2  
 188:8 191:12,13  
 194:6 198:1 199:15  
 202:13,22 203:13  
 204:3,6 211:10  
 213:21,21 214:16,21  
 221:1,2 234:4 296:22  
 310:5  
**profession** 198:17  
**professional** 327:19  
**profile** 173:16  
**profound** 53:14 89:1  
**program** 2:11,13,15,17  
 2:19 5:12,18 25:2  
 37:11 40:1,12 42:6  
 45:15 49:20 50:15,18  
 52:3 54:5 64:7,12  
 65:7,20 79:21 83:10  
 110:22 124:11 136:5  
 143:20 189:4 193:18  
 208:16 217:21 226:16  
 226:18 227:8,9,18,19  
 227:21 228:6 231:7  
 232:2,3 240:14,17  
 241:1 245:14 250:7  
 256:3 260:2 267:17  
 268:6,13 269:21  
 270:2,19 271:6  
 276:11 292:2 294:6  
 298:13,13,14,22  
 301:14,20,22 302:2  
 305:7 306:2 310:8  
 311:10 327:9 328:1  
 330:3  
**Program's** 249:10  
 255:19

**programs** 64:22 231:8  
 236:5 328:3  
**progress** 254:14 260:1  
**prohibit** 6:3  
**prohibited** 95:20  
**prohibition** 97:5  
**projected** 52:22  
**projects** 238:4 300:9  
**prolapsed** 95:13,16  
**promised** 311:11  
**promote** 192:10  
**prompt** 219:21  
**pronounce** 299:14  
 314:15  
**proper** 106:11  
**properly** 104:20 251:14  
**properties** 148:6 181:2  
 181:13  
**property** 180:22  
**proposal** 3:3,11 4:2,8  
 6:3 22:22 27:1 34:20  
 36:12 38:13 39:17  
 40:10 46:3 55:2,6  
 56:1 77:5 110:21  
 114:1 137:15 145:18  
 177:4 189:4 217:9,16  
 218:21 221:16 227:7  
 227:18 228:8 230:6  
 241:14 242:8,11  
 243:6 244:9,19 254:3  
 259:14 266:13 267:12  
 273:13 274:12 286:2  
 286:9 288:19,20  
 290:15 293:5 298:20  
 302:3  
**proposals** 241:9 242:3  
 247:6 291:13  
**proposals/Final** 4:11  
**proposed** 43:6 49:18  
 49:22 66:3 226:12,20  
 301:9 311:17  
**prospectively** 277:5  
**prosper** 291:8  
**protect** 24:5 159:2  
 163:19 294:17  
**protecting** 23:22 36:13  
 37:7  
**Protection** 43:7  
**protein** 95:3 179:6  
**proteins** 150:8  
**protocols** 94:3  
**prove** 208:12  
**proven** 309:7  
**provide** 36:9 173:17,22  
 181:1 188:7 223:18  
 231:16 252:19,20  
 276:5  
**provided** 212:15 253:2

**provides** 104:21  
**providing** 261:1 325:14  
 327:22  
**prudent** 227:14 319:12  
**prunings** 17:8  
**public** 7:6 8:12 12:10  
 23:17 25:8 26:17,18  
 27:6 42:8,13,16 43:13  
 64:9 65:4 86:2 93:14  
 116:10 118:14 124:3  
 126:7 136:16 137:19  
 144:21 148:13 152:22  
 153:2 156:16,17  
 158:22 161:10 163:10  
 164:9,12 174:15,17  
 176:21 177:3 179:3,4  
 179:8 180:17 191:6,8  
 192:19 197:19 207:6  
 211:11 217:18 218:7  
 220:16 222:6,22  
 225:19 226:22 228:5  
 229:12 234:1 244:22  
 250:5 254:3 255:6,7  
 257:8,21 261:5 264:1  
 264:6,13,21 269:9,12  
 269:19 289:1 294:7  
 294:12 301:8 312:10  
 315:16 322:14 327:17  
 327:20,21 328:5,6  
 329:21  
**publicly** 311:8  
**published** 185:21  
 255:22  
**pull** 15:5 119:9 237:21  
 317:5 321:9 323:15  
**pulled** 9:2 40:15 264:12  
 273:14  
**pulling** 132:19 291:16  
**pure** 128:5  
**purely** 133:20  
**purist** 181:17  
**purity** 288:5 289:5,8  
 290:19  
**purposes** 186:9  
**pursue** 183:21  
**pursuing** 250:12  
**purview** 186:1  
**put** 23:9 28:2 29:22  
 37:12 43:17 45:4 56:4  
 76:6 77:10,19,22  
 93:17 106:15 110:22  
 121:11 123:13 137:20  
 137:22 141:7 143:21  
 144:1 199:22 200:14  
 217:20 230:6 238:19  
 243:10 245:14,22  
 247:6 249:19 250:5,7  
 252:11 254:3,10

277:10 279:6 282:22  
 286:19 288:21 298:3  
 302:11  
**puts** 258:9  
**putting** 16:17 74:5  
 131:3 133:7 145:9  
 218:8 230:18 254:18  
**puzzle** 51:1 130:7

---

**Q**


---

**qualifications** 292:7  
**qualified** 198:21  
**qualifies** 326:13  
**quality** 10:1,6,11 19:11  
**quantify** 78:13  
**quantitative** 78:6,6,9,11  
 78:16  
**quantity** 182:7 184:20  
**queries** 203:6  
**question** 12:14 13:11  
 20:4,8 56:21 57:3  
 76:20,21 105:8  
 115:19 117:6 119:2  
 126:19 148:11 180:7  
 180:15 182:17 189:9  
 191:5 193:17 204:11  
 204:20 206:11 208:15  
 212:4 233:11 245:20  
 253:20 254:2 255:21  
 282:12,20 284:1  
 286:12 292:22 323:8  
 323:13 325:2  
**questioned** 126:11,12  
 126:13  
**questioning** 179:9  
**questions** 8:2,9 30:22  
 45:8 75:9 76:13 80:10  
 114:4 156:22 179:22  
 195:19 196:12 207:7  
 212:1 226:2,21  
 227:15 228:13 232:12  
 235:17 292:16 301:4  
 303:12,13,22 304:11  
 314:15 316:5  
**quick** 6:2 16:16 36:19  
 44:22 121:11 208:16  
 216:19 329:20  
**quickly** 50:2 66:19  
 154:12 250:15 270:1  
 270:6,18 273:4 284:2  
**quite** 22:4 23:5 31:18  
 35:20 46:16,22 49:4  
 52:6 73:12 130:13  
 199:13 223:11 244:12  
 257:9 265:16 280:9  
 299:11 302:14 306:12  
 307:15 313:16  
**quitters** 317:20

**quote** 62:6

---

**R**


---

**raise** 45:9 70:21 194:3  
 256:16  
**raised** 49:15 59:3 101:4  
 114:4 189:18 196:20  
**raises** 20:4 75:9  
**raising** 50:15 197:6  
 270:14  
**Ramaswamy** 240:19  
**ran** 227:11  
**ranchers** 194:3  
**random** 57:14  
**range** 27:22 28:5 79:7  
**ranging** 308:14  
**rapid** 67:12 109:17  
 113:16  
**rapidly** 261:20 269:21  
 277:12,17 281:8  
 309:16  
**rare** 95:16,18  
**rates** 168:16  
**raw** 185:9 212:10  
**re-** 189:13 300:11  
**re-classify** 218:16  
**re-look** 73:17  
**re-read** 190:1  
**re-scoped** 292:6  
**reach** 29:7 203:11,21  
 247:15  
**reached** 24:8 66:5  
 231:10  
**reaching** 205:20  
**reaction** 57:14  
**read** 13:3 20:11 35:10  
 94:18 143:6,14 152:7  
 171:7 296:14 299:20  
 300:14 304:15 325:2  
**readers** 230:2  
**readily** 86:4 170:11  
**reading** 8:12 188:6  
 252:20  
**ready** 38:6 54:18 86:14  
 89:10 91:13 98:9  
 102:11 108:4 112:4  
 121:8 134:20 139:19  
 172:6 188:13 218:13  
 242:6 266:6 283:13  
 285:16 288:19  
**real** 40:2 76:14 121:11  
 137:17 196:12 208:16  
 216:19 302:16 308:8  
 310:17 311:13,16,20  
 315:17 316:14  
**reality** 67:11  
**realize** 195:21 294:18  
**realm** 80:14

**reason** 74:17 79:14  
 120:2 122:4 164:13  
 164:14 167:20 279:1  
 286:21 288:13,17  
**reasons** 79:11 167:9  
 277:14 290:18  
**recall** 227:5  
**receive** 42:6 209:7  
 220:1 257:8 319:20  
**received** 26:18 27:7  
 39:22 40:11 42:16  
 101:10 105:2 114:5  
 124:11 148:10,12  
 150:10,15 152:22  
 153:1 161:10 163:11  
 163:20 174:16 202:18  
 215:12 224:6,12,16  
 227:8,15 261:7  
 301:12 303:4  
**receives** 319:22  
**receiving** 251:1  
**recess** 83:15,20 228:18  
**recipe** 214:19  
**reclassification** 4:3  
**reclassify** 177:5  
**Recognition** 4:14  
**recognize** 42:1 252:2  
 290:11  
**recognizes** 137:5  
**recommend** 24:20  
**recommendation** 94:19  
 95:1 217:3,6  
**recommendations**  
 105:4 208:18 236:21  
 260:4 275:11  
**recommended** 114:8  
 121:16 274:17  
**recommending** 25:4  
**recommends** 104:22  
**record** 123:21 175:7  
 206:22 207:6 228:20  
 263:10 288:10,15,17  
 294:15 325:8,12  
 330:19  
**records** 325:6  
**recovering** 26:6  
**recuse** 219:13  
**recycle** 20:19,21  
**recycled** 296:19  
**recycling** 20:20 21:14  
**red** 10:20 29:22 318:14  
**redefining** 243:13  
**reduced** 214:18  
**refer** 38:13,17 102:2  
 145:18 146:1 267:12  
 284:8,14 292:11  
 298:15 323:16  
**reference** 117:16 220:5

**referenced** 289:16  
**referencing** 214:15  
 288:22  
**referred** 24:14 147:4  
**referring** 245:3  
**reflect** 229:12  
**reflected** 116:2 240:2  
**reflecting** 214:12  
**regard** 50:6 163:16  
**regarding** 39:17 101:5  
**regardless** 197:16  
**regards** 180:14 183:13  
**regenerate** 222:11  
**regenerative** 311:18  
**Region** 53:14 66:14  
 70:2  
**regional** 35:21 36:7,15  
 36:21 107:4 294:13  
**regions** 30:18,19 31:13  
 197:4 202:5  
**regression** 20:7  
**regret** 260:20 281:17  
**regular** 19:19  
**regulated** 185:22  
**regulating** 27:10  
**regulation** 23:16 40:3  
 42:2,7 43:22 118:4  
 142:6 198:8 236:10  
**regulations** 49:21 62:2  
 100:3 119:14  
**regulations.gov** 206:21  
**regulator** 156:14  
**regulatory** 39:21 42:19  
 43:9 50:13 194:11  
 197:2  
**reiterate** 134:15 159:14  
 251:22  
**iteration** 229:9  
**reject** 47:15 55:7 140:4  
 218:21 242:12 286:10  
**related** 17:6 50:5 51:5  
 65:2 138:8 173:14  
 227:12  
**relates** 243:15  
**relating** 142:1  
**relationship** 64:7  
**relatively** 6:19  
**relegated** 308:14  
**relevance** 241:15  
**relevancy** 241:17  
**relevant** 12:19 51:11,12  
 295:4 317:19  
**relist** 86:7,10 150:14,15  
 152:22 153:2  
**relisted** 85:15 115:7  
**relisting** 101:3 105:3  
 110:8 176:22 192:4  
 215:4 217:12

**rely** 184:16 305:22  
**remain** 63:16 217:4  
 244:7 304:22 320:11  
**remained** 41:18  
**remaining** 154:22 320:3  
**remains** 6:9  
**remark** 173:12  
**remarks** 4:18 327:7,8  
 327:10,14 328:9  
**remember** 26:22 33:9  
 80:10 111:18 215:11  
 226:13 250:22 274:10  
 301:12  
**remembered** 279:5  
**remembers** 273:4  
**remind** 208:9 216:20  
 243:11 313:17  
**reminded** 34:3  
**reminds** 306:9  
**remiss** 295:8 329:2  
 330:4  
**removal** 120:9 141:11  
 148:12 214:2  
**remove** 14:13 39:21  
 86:17,20,21 89:13,18  
 89:19 91:10,15,17,18  
 93:2 95:1 96:2,5  
 98:12,18 101:16  
 102:8,9,13,15,16  
 103:14 108:6,10,10  
 112:6,8,8 115:15  
 120:8 121:3,22 122:6  
 122:7 148:8,17,21  
 149:1,2 150:8,18  
 151:5,7 153:3,8,10,11  
 155:4,6,6 157:3,5,6  
 159:21 160:1,2  
 161:17,19 172:8,12  
 172:13 175:10,13,13  
 177:9,11 188:15,17  
 188:18 190:2,4  
 200:19,21,21 203:18  
 203:19 204:21 205:4  
 205:5 209:14,19,20  
 215:21 216:1  
**removed** 14:9 88:22  
 94:17 95:19 198:14  
 229:10  
**removes** 205:6  
**removing** 96:12,19  
 97:10 116:15  
**renamed** 309:21  
**renew** 199:16  
**renewal** 94:14  
**renewed** 93:22  
**reorganization** 121:16  
 217:3 301:16  
**repeat** 215:11 297:15

318:20  
**repeated** 95:13 320:4  
**repeatedly** 233:15  
**repellant** 125:9  
**replace** 46:5  
**replacement** 321:21  
**report** 44:2 85:6 92:20  
 100:14 104:3,12  
 124:17 136:14,15  
 137:12 152:11 156:8  
 158:12,14 161:3  
 163:5 174:8 176:15  
 178:13 179:13 211:1  
 220:9  
**reporter** 308:17 309:11  
**reporting** 66:16 68:5  
**reports** 29:3 136:11  
**represent** 94:21 96:14  
 164:10 312:10  
**representation** 233:9  
 233:13  
**representatives** 311:8  
**represents** 195:7  
 311:16  
**reproductive** 165:2  
**request** 12:10 27:15  
 40:11,17 50:8 66:8  
 74:9 124:18 136:13  
 198:16,20 289:16  
 292:2 298:3  
**requested** 66:12 189:4  
 243:10  
**requesting** 174:18  
**requests** 124:14 136:6  
 298:11  
**require** 184:13 254:15  
**required** 41:7 126:1  
 278:3  
**requirement** 111:17  
 208:5 321:20  
**requirements** 14:3  
 40:21 41:21 80:22  
 111:15  
**requires** 41:9 66:19  
 100:5 109:10 113:9  
 197:15 246:10,11  
 320:9  
**research** 4:9 105:4  
 106:6 107:10 204:19  
 229:7,13 230:9 233:6  
 233:9,13,14,22  
 234:14,15,18,22  
 235:6 236:11,19  
 237:18 238:16,21  
 239:4,5 240:18 241:8  
 242:2,9 247:18 284:4  
**researched** 266:3 269:5  
**researchers** 240:4

**researching** 30:17  
**reservations** 11:16  
 126:9  
**residual** 88:5,6 162:21  
 162:22  
**residues** 111:10  
**resistance** 129:18,20  
**resolve** 306:12  
**resolved** 15:11 16:1  
 69:18 298:20  
**resort** 142:18  
**resources** 28:16 29:10  
 37:15 59:22 193:19  
 236:18 237:2  
**respect** 199:6 229:14  
 270:7 278:9  
**respiratory** 165:22  
**respond** 63:21 70:15  
 232:6 250:2 270:6  
 277:17  
**response** 57:14,22  
 67:12 72:12 124:17  
 260:9  
**responsibilities** 318:6  
 327:19  
**responsibility** 34:13  
 80:11 163:15 325:11  
**responsible** 69:4  
**rest** 9:4  
**restart** 169:19  
**restrict** 49:20  
**restricts** 99:21  
**result** 129:6 309:10  
**resulted** 73:4  
**resulting** 306:14  
**results** 319:16  
**resumed** 123:21 228:20  
**retail-** 41:21  
**retail-labeled** 41:16  
**retailer** 75:12,16 76:12  
**retailers** 62:20  
**retain** 86:22 89:19  
 91:10,18 98:19  
 102:16 108:11 112:9  
 118:9 122:7 149:2  
 151:8 153:4,11 155:7  
 157:6 160:3 161:19  
 172:13 175:14 177:11  
 179:2 188:18 190:5  
 195:1 200:22 204:22  
 209:21 216:1  
**retaining** 161:11 174:16  
 211:12 286:5  
**retains** 325:11  
**retired** 64:3  
**retrospectively** 277:4  
**return** 124:2  
**reveal** 58:12

**revealed** 25:9 220:16  
**reverse** 100:7,19  
**review** 3:5,15 6:2 18:21  
 25:1 27:8 29:17 31:5  
 34:2 89:6 93:7,7  
 101:21 126:22 147:16  
 148:2 150:11 154:21  
 159:5,15 164:3  
 165:14 166:3,5,21  
 167:21,22 168:6  
 170:4,15 189:15  
 208:21 210:21 225:1  
 225:6 226:13,16  
 227:4 228:4,7 236:1,4  
 236:13,18 240:3  
 250:17 251:17 265:17  
 268:10 276:12,15  
 301:15 302:7 307:14  
 317:8  
**reviewed** 18:22 100:21  
 106:10 109:22 111:13  
 113:21 121:17 150:13  
 154:19 161:12 163:21  
 169:12 174:22 179:11  
 179:12 196:10 264:9  
**reviewers** 241:10  
**reviewing** 10:14 18:16  
 100:22 156:11  
**reviews** 136:18 195:17  
 225:7,10 226:20,21  
 227:2,21 241:16,17  
 307:16  
**revise** 75:1  
**revised** 246:1  
**revising** 286:4  
**revisions** 304:6  
**revisiting** 249:4  
**revocation** 65:21 71:11  
**revocations** 66:1 68:1  
**revoked** 67:19  
**revote** 320:2,6,7,9  
**rewarding** 328:14,17  
**rice** 1:17 22:17,20 25:6  
 26:19 28:8 31:8,22  
 33:8 34:12 35:15  
 36:17 38:3 39:11,16  
 46:6,9 48:4,10 52:11  
 54:3,18,22 55:17 56:2  
 56:19 57:8 58:16  
 61:21 63:17 72:8 75:5  
 77:3 79:2,16 83:7  
 87:10 90:6 92:4 99:4  
 102:22 108:15 112:13  
 117:6 122:10 135:6  
 140:19 146:22 149:15  
 151:19 155:17 157:16  
 162:4 172:19 175:19  
 177:15 190:8 201:2

202:2,9 203:5 205:9  
 206:4 207:19 209:6  
 210:14 216:15 219:9  
 219:18 221:6 222:17  
 223:16 242:22 251:20  
 255:1 285:6 287:12  
 291:22 293:13,20  
 294:20 295:2,6,12  
 305:3 326:10,13  
**Richardson** 111:14  
**rid** 131:17 133:12  
 264:19  
**rigorous** 61:11 169:22  
 248:10 250:16,17  
 307:15  
**rinse** 158:19  
**risk** 57:13 89:4 179:17  
 236:13  
**risks** 164:18  
**road** 246:5  
**roadmap** 68:10 142:19  
**Robert's** 284:12  
**robust** 23:17 93:20  
 235:14  
**role** 56:22 80:16 82:3  
 83:4 231:15 233:20  
 311:10 314:19 316:19  
 316:19 327:21  
**roles** 318:9  
**rolled** 14:4  
**room** 48:17 144:18  
 271:10  
**rotate** 229:22  
**rotation** 129:19  
**round** 156:17 202:12  
**routinely** 89:2 191:19  
**rub** 128:22 129:3  
**rubbing** 125:12 128:9  
**Ruihong** 290:3  
**rule** 14:7 24:16 50:1  
 142:13 308:18  
**rulemaking** 25:5 78:4  
 78:19 111:1 144:1  
 208:20 250:13,18  
**rules** 61:17 169:4  
 214:15 284:12 312:22  
**run** 10:8 33:12,15 59:15  
 291:17 295:22 317:13  
**running** 199:9 232:3  
 267:15 319:10,17  
 321:8  
**runoff** 16:20

---

**S**

---

**sad** 141:2  
**safe** 88:7 163:1 167:8,9  
**safety** 163:14,16 164:1  
 164:8 166:18 171:6

171:11  
**salad** 187:14,16  
**sale** 41:15 212:12  
**sales** 81:9 238:14 239:3  
 308:3  
**salt** 296:4  
**Sam** 240:6  
**sanitation** 159:10  
**sanitize** 163:9 168:22  
 169:5  
**sanitizer** 84:21 88:15  
 88:22 137:7  
**sanitizers** 89:6 137:4  
 159:6 164:3 165:19  
 166:22 167:1 170:5,6  
 304:2  
**sanitizers'** 165:15  
**sanitizing** 88:3,17  
 158:10 162:20 169:7  
**satisfied** 180:3  
**satisfy** 181:14  
**sausage** 192:11  
**save** 326:21 328:10  
**saw** 11:1,6 23:19 40:8  
 42:8 82:7 117:7  
 180:17 181:18 187:4  
 276:8 310:19  
**saying** 54:2 82:1 115:7  
 118:15 159:5 163:21  
 168:14 184:12 204:13  
 215:15 218:7 253:12  
 256:17 257:22 258:3  
 264:1 265:12 269:13  
 280:8 290:1 317:20  
**says** 14:8 23:14 83:15  
 119:8 273:16 277:9  
 305:14 314:8  
**scale** 170:17 206:18  
 309:20  
**scaring** 326:12  
**scenes** 308:10 329:5  
**schedule** 318:1  
**science** 270:17 278:4  
**Sciences** 236:12,17  
**scientific** 283:17  
**scientist** 69:22 244:2  
 314:18  
**scientists** 278:16  
**scope** 247:21 293:11  
 293:22  
**Scott** 1:17 22:17,18  
 39:15 49:5 83:14  
 135:5 201:1 202:1  
 205:7 207:17 209:5  
 209:18 219:17 223:15  
 251:19 252:18 291:21  
 292:16 293:9 326:7,8  
 326:19 327:1,3

328:22  
**Scott's** 50:16 252:16  
**scrapes** 37:21  
**scratch** 133:10  
**screen** 273:19  
**scroll** 159:19,20 275:12  
 275:14,15 286:6  
**scrolling** 275:14  
**scrubbers** 132:15  
**scrutiny** 53:20 307:16  
**SDBS** 299:18  
**se** 293:16  
**sea** 174:7  
**seamless** 330:6  
**seamlessly** 312:1  
**search** 65:18 68:3  
 208:12  
**searches** 197:15  
 208:19  
**season** 14:10,16  
**seasonal** 107:4  
**seats** 124:2  
**second** 24:22 46:8,9  
 59:11 93:7 145:15,16  
 150:5 152:5 267:9  
 307:18 314:12 315:13  
 317:16 321:3,5  
 323:15 324:3  
**secondary** 158:8  
**seconded** 38:16 47:12  
 55:5 86:20 89:17  
 91:16 98:18 102:14  
 108:9 112:7 122:5  
 135:4 140:3 145:22  
 148:22 151:6 153:9  
 155:5 157:4 160:1  
 161:18 172:11 175:12  
 177:10 188:17 190:4  
 200:20 209:19 215:22  
 218:20 242:10 266:21  
 267:10,13 273:17  
 284:9 286:8  
**Secondly** 100:4  
**secret** 318:12  
**secretary** 1:12 50:20  
 317:12 318:15,18  
 319:3,5,7,15 320:13  
 322:2 325:1,3,13,17  
 326:19  
**section** 23:13 49:21  
 84:15 88:1 90:18  
 92:17 98:14,15  
 103:21 124:14 136:7  
 142:8 145:10 147:16  
 156:6 158:6 191:9,10  
 196:13 200:12 201:21  
 209:17 223:13 306:8  
**sections** 142:13 200:11

286:1  
**sector** 165:5,8  
**sedation** 100:7  
**seed** 4:10 54:5 288:5  
 289:5,7,8 290:19,21  
 290:21 291:2 300:8  
 303:18  
**seeing** 16:8 91:12  
 131:13 133:3,8 146:7  
 153:6 155:1 156:22  
 161:14 175:4 177:6  
 261:16 262:9 287:3  
 313:9 316:8 324:15  
**seek** 207:6  
**seen** 28:15,19 81:5  
 110:9 117:15 128:19  
 128:21 131:5 169:17  
 222:20 264:2,21  
 302:13  
**sees** 200:13  
**segregate** 193:3  
**Seitz** 1:18 16:2 39:10  
 48:3 55:16 56:21 87:9  
 90:5 92:3 99:3 100:17  
 102:6,21 108:14  
 109:15 112:12 113:15  
 116:1 118:18 122:9  
 135:19 140:18 146:21  
 149:14 151:18 153:21  
 155:16 157:15 160:9  
 162:3 172:18 175:18  
 177:14 190:7 201:15  
 207:13 210:13 216:14  
 242:21 245:20 252:9  
 258:12 259:2 269:2  
 280:3 283:10 285:5  
 287:11 288:8,13,16  
 289:10,13 290:8,10  
 291:4 297:4 304:5  
 326:3,4  
**self-nominate** 317:17  
**sell** 76:4 188:8  
**seller** 211:16  
**selling** 75:17  
**semester** 22:14 302:19  
**Senate** 311:8  
**send** 12:10 24:20 27:7  
 143:7 145:13 246:6  
 265:11 266:11,15,20  
 267:7 272:17 274:7  
 276:9  
**sense** 18:4 35:12 61:18  
 69:11 70:13 74:22  
 102:9 142:4 164:9  
 205:2 231:13 251:3  
 258:11 267:5 269:21  
 278:11 320:9  
**sensible** 225:12

**sensitivity** 59:15  
**sent** 206:19 215:17  
 269:3  
**sentences** 293:21  
**separate** 40:17 51:8  
 189:3,5 220:18  
 222:10 256:1 286:18  
**separating** 19:9 220:14  
**separation** 178:20  
**serenades** 315:4  
**serious** 165:5,21  
**Seriously** 237:6  
**serve** 138:22 236:7  
 241:13 298:10 312:4  
 317:21  
**served** 241:11 315:13  
**serves** 139:13,14,15  
 207:13 324:10,12  
 325:4  
**service** 5:18 173:19  
 305:16 313:19 330:11  
**serviced** 53:6  
**services** 24:1 36:13  
 165:10  
**serving** 231:14 325:22  
 328:15  
**session** 64:2 123:9  
**set** 12:20 52:21 76:19  
 94:1 197:22 246:19  
 258:4 262:14 288:10  
**setting** 61:17 128:4  
 181:11 183:6  
**settings** 164:12 165:16  
 202:10  
**settlement** 66:4  
**settles** 139:3  
**settling** 138:20 139:2  
**seven** 105:5 109:12  
 110:7 113:11 114:5  
 148:17 150:19 153:4  
 244:14 245:15 261:8  
 264:10 275:18 276:12  
 279:15  
**shaking** 263:4  
**shallow** 37:21  
**shape** 15:7,15 278:20  
**share** 6:11 28:10 65:11  
 65:12,12 67:13 80:1  
 127:11 194:1 231:22  
 232:4,11 279:9 290:4  
 297:18 306:4 315:3  
**shared** 65:16 175:8  
 231:4,5 297:15  
**sharing** 232:9 240:1  
**shavings** 128:7  
**sheds** 223:14  
**sheep** 104:10,16  
 125:11

**sheet** 38:9  
**shells** 152:15  
**shelves** 309:18  
**shipment** 57:1  
**shipments** 309:4,6  
**shipping** 73:3  
**shiritaki** 202:6  
**short** 222:1 290:14  
 323:18  
**short-term** 109:18  
 113:17  
**shortened** 110:5  
 219:20  
**shot** 308:18  
**show** 58:7 275:9  
**shows** 106:6  
**shutter** 53:11  
**side** 49:13 61:4 128:3  
 130:3 131:1 239:1  
**side-wise** 325:20  
**sides** 279:3 297:5  
**significant** 45:11,12  
 171:4  
**silica** 152:15  
**silicate** 296:20  
**silly** 52:4 59:14  
**silver** 300:3  
**similar** 27:12 105:10  
 113:22 194:15 212:22  
 236:4 264:9 276:5  
**similarly** 203:5 324:16  
**simple** 57:9 193:2  
 284:13  
**simply** 120:18 269:18  
**sing** 255:4  
**single** 67:19 87:21  
 88:13 172:10 179:16  
 251:9  
**single-farm** 312:3  
**sink** 17:18  
**sit** 305:12  
**site** 30:15 65:22 66:2  
 68:6  
**sites** 16:6 76:6  
**sitting** 13:21  
**situation** 51:12,13  
 58:13,15 120:12  
 223:9  
**situations** 58:2,3  
 168:14  
**six** 244:14 252:11 254:8  
 260:1 280:8  
**sixth** 234:20  
**size** 80:13 193:4 195:13  
**skills** 247:19  
**skin** 127:1,6  
**skip** 92:5  
**slam-** 263:13

- slate** 22:14 28:17  
**slaughter** 100:11  
 109:12 111:7 113:11  
**slaughterhouses** 194:5  
 200:6  
**slaughtering** 199:20  
**slides** 11:1 65:17  
**slow** 309:8  
**slowly** 152:7  
**small** 73:21 80:12 82:9  
 123:15,17 170:17  
 171:20 183:22 193:5  
 193:12 197:3 206:18  
 304:7 315:14  
**small-scale** 170:10  
 171:14  
**smaller** 56:14 107:22  
**smaller-scale** 120:12  
**smoothies** 179:6  
**sneaking** 295:6  
**socialize** 293:6,12  
**sodium** 3:7,17,18,19,21  
 88:10 156:3,7,11  
 157:3 158:4,8,17  
 159:21 163:3 178:7  
 178:11,15 180:5,6,18  
 180:20,22 181:8  
 182:7,20 184:14  
 188:15 190:2 296:5  
 296:18 299:22 300:1  
**soil** 17:8,11,11,13,17  
 63:14 105:14,19  
 125:7 234:10 309:19  
 311:22 314:18  
**soils** 129:9  
**sold** 204:9 309:5  
**solicit** 203:15 222:6  
**soluble** 202:5  
**solution** 167:15  
**solve** 60:19 81:22 139:4  
 139:6 144:19 185:18  
 198:9,10  
**solved** 60:15,16 290:13  
**someone's** 14:11 82:13  
 206:6  
**somewhat** 27:3 30:21  
 50:5 56:14 142:19  
 145:5 220:17 247:2  
 272:13 298:2  
**song** 255:4  
**Sonny** 239:18  
**soon** 40:18  
**soothing** 139:14  
**sophisticated** 71:16  
 72:2  
**sorely** 314:21  
**sorry** 8:10 10:20 28:2  
 38:20 84:3 99:16  
 126:19 154:10,11  
 194:20 235:18 248:13  
 266:9 276:8 297:10  
 298:8 302:16,17  
**sort** 16:3 17:6 30:20  
 70:13 78:5,12 184:7  
 192:18 207:16 231:9  
 235:22 266:3 270:5  
 282:1 297:15,16  
**sorting** 193:19  
**soul** 235:15  
**sounded** 225:12  
**sounding** 314:9  
**sounds** 144:5  
**source** 198:4 206:12  
 209:9 211:7 214:3,4  
 215:6 247:12  
**sources** 198:17 205:3  
 212:8  
**sourcing** 80:17,19  
**soy-based** 21:5 156:18  
**soybean** 199:10  
**speak** 48:17 65:7  
 170:21 171:3 180:12  
 180:13 185:15 221:9  
 244:2 278:4 305:1  
**speaker** 10:3 60:21  
**speakers** 11:6 60:13  
**speaking** 65:3 278:16  
 314:5  
**speaks** 314:7  
**special** 64:6  
**specialist** 2:11,16  
 325:8  
**species** 24:5 30:18  
 130:11 134:10 243:19  
**specific** 7:3 8:3,17  
 13:13 67:14 69:13  
 86:8 101:6 145:7  
 233:14 261:6  
**specifically** 13:11 29:9  
 29:13 104:8 118:15  
 226:8 257:6 261:9  
 291:2 292:22 330:5  
**specified** 147:20  
 319:11  
**spectrum** 10:20 259:5  
**spectrums** 7:10 8:17,19  
**speeded-** 100:22  
**speeded-up** 110:1  
**spend** 9:15,16 251:9  
**spent** 10:13 72:15  
**spices** 73:9  
**spirit** 307:4  
**split** 115:4 116:12  
 121:10 179:3  
**spoke** 181:3 211:13  
 233:18 258:2 293:10  
 309:11  
**spoken** 207:2  
**spot** 28:3 121:12  
 208:16 230:19 279:6  
**spots** 47:2  
**spray** 137:1  
**spraying** 164:15  
**spread** 101:1  
**spreading** 134:1  
**spreads** 82:8  
**spring** 107:9 145:2  
 148:10 152:21 156:17  
 174:20 177:2 186:22  
 192:3 215:12 219:19  
 222:3 290:16 296:3,8  
**spring's** 192:17  
**stabilizer** 156:14  
 202:11  
**stabilizing** 179:7  
**stacked** 11:5  
**staff** 2:9 307:8  
**stages** 82:15  
**stakeholder** 230:7,12  
**stakeholders** 222:7  
 259:17 289:2  
**standard** 76:18,19  
 223:4 310:20 311:1  
**standardize** 212:11  
**standardizing** 212:17  
**standards** 1:3 2:14 9:10  
 12:20 76:1 213:19  
 305:17 308:11 328:21  
**standing** 272:16  
**standpoint** 127:21  
 257:2 268:14 271:4  
**start** 7:18 38:20 47:12  
 55:5 74:5,6 76:13  
 84:11,14 87:1 89:20  
 91:19 98:19 102:17  
 108:11 112:9 122:8  
 135:5 138:17 140:5  
 143:3 146:3,8 149:3  
 151:8 155:7 157:6  
 160:3 161:20 172:14  
 175:14 177:12 193:4  
 194:14 195:16 198:7  
 209:21 216:2 218:22  
 228:17 229:6 242:10  
 267:22 278:17 284:16  
 286:11 287:4 298:11  
 299:18 318:17,22  
**started** 5:10 39:20  
 83:19,21 124:4  
 307:22  
**starting** 38:10,11 96:8  
 124:7 138:18 147:13  
**starts** 190:5 278:20  
 317:14  
**state** 10:4 36:2,6 120:9  
 199:21 200:7 225:7  
 295:15  
**stated** 114:6 156:17  
 221:16 286:2  
**statement** 41:11 82:22  
 159:13 252:13  
**statements** 273:15  
**states** 1:1 94:11 197:5  
 213:7 317:21  
**stating** 224:13  
**status** 63:14 196:22  
 197:8  
**stay** 101:15 104:22  
 112:2 170:8 175:1  
 229:22  
**stays** 14:14  
**stearate** 300:18  
**steep** 53:2  
**stems** 193:21  
**step** 10:17 11:8 26:5  
 27:19 28:14 43:18  
 48:14 49:1 131:4,6  
 240:13 299:3 313:2  
**steps** 5:14 6:11 50:3  
 68:10 81:10  
**sterilize** 169:18  
**steroid** 95:4  
**Steve** 1:15 15:1 17:4  
 98:20 130:1 161:20  
 171:12 176:17 177:10  
 192:15 195:12 205:1  
 214:8 217:10 218:19  
 237:13 263:7 264:1  
 266:8 267:13 269:3  
 284:9 294:4 302:9  
 315:11  
**stick** 142:7 289:7  
**stimulant** 139:15  
**stone** 277:11  
**stop** 273:16 309:8  
**storage** 154:17 161:6,9  
**store** 309:18  
**story** 309:11  
**straightforward** 177:1  
 217:19 263:12  
**strategically** 163:13  
**strategy** 26:22 104:15  
 144:4  
**Straus** 96:11 143:11  
**stream** 19:5 189:17  
**streamlining** 235:14  
**Street** 1:9 21:15,21 22:1  
**strength** 80:6  
**strengthen** 44:15 78:16  
**strengthening** 40:6  
 44:20 50:21  
**stress** 42:15 170:7

235:13  
**stretch** 274:2  
**strict** 20:5  
**stricter** 21:12  
**stronger** 145:2 311:9  
**struck** 35:16  
**struggle** 50:2 138:4  
 187:18 194:4  
**struggled** 27:11  
**struggling** 8:14 263:8  
**studies** 107:13 125:17  
**studying** 10:6  
**stuff** 61:1,8  
**sub-** 272:10  
**sub-tropical** 202:5  
**subcommittee** 3:5,14  
 4:1,7,12 6:17 8:7  
 19:18 22:13,16 24:20  
 25:22 38:14,18 74:9  
 83:12 84:7 86:7 91:9  
 93:2 96:5 101:13  
 104:18 110:12 115:5  
 124:18 136:13 137:5  
 137:16 141:9 143:8  
 145:14,21 146:1  
 147:4,16 148:16  
 179:1 180:2,9,12,13  
 189:20,20 221:1,10  
 228:18 229:6 230:17  
 254:4 256:20,21  
 259:13 266:20,22  
 267:13 273:12 278:2  
 284:8,14 286:1 288:1  
 288:4 291:10,16,18  
 291:19 292:12 295:17  
 296:1,12 298:12,17  
 303:16 314:2 324:10  
 324:13 325:5  
**subcommittee's** 95:1  
 290:14  
**subcommittees** 189:19  
 307:17  
**subjected** 127:6  
**submit** 191:7 289:3  
**submitted** 124:12 136:4  
**subsequently** 110:3  
 113:22  
**substance** 84:18 95:21  
 100:18 109:16 115:3  
 120:8 124:20 126:16  
 129:21 136:12,17,19  
 156:6 161:3 178:10  
 210:22 211:2,12  
 212:15 217:22 227:4  
**substances** 3:5,15 4:6  
 84:16 147:18 148:8  
 156:15 226:5,7,13,22  
 227:1 228:1,4,7,10

**substantive** 254:6  
 258:14,21 259:6,15  
**success** 97:12  
**succinct** 192:13  
**succinctly** 232:19  
**sucrose** 296:21 303:10  
**Sue** 1:13 31:9 33:8  
 36:17 54:3 89:17  
 91:16 107:18 120:16  
 122:6 123:2,3 128:18  
 132:22 140:5 195:5  
 196:17 209:21 249:7  
 250:4 276:10 282:11  
**Sue's** 134:2  
**suffering** 309:9  
**suffers** 95:12  
**sufficient** 181:14  
 212:10 225:17 276:5  
**sufficiently** 208:14  
 224:14  
**sugar** 214:18 215:1  
**suggest** 39:21 45:20  
 167:21 240:12  
**suggested** 126:11  
**suggesting** 12:4 115:6  
 195:2  
**suggestion** 43:20  
 144:13 186:8 235:21  
**suggestions** 34:21 44:2  
 192:8  
**suitable** 119:16  
**suite** 69:9  
**sulfate** 3:9 103:18  
 104:2,7,19 107:8  
 108:6  
**sulfonate** 300:1  
**sulfur** 3:11 124:7,11,14  
 124:19 125:3,8,12,18  
 128:1,5,8,20 130:4,18  
 131:11,22 132:10,13  
 133:16,19 135:3  
 296:5,21,21 300:19  
**sulfurous** 297:1  
**sulphate** 99:16  
**summarized** 179:21  
**summary** 44:22 45:7  
 192:13 205:12 230:4  
 230:11 232:18 240:2  
 312:19  
**summer** 67:6  
**sunlight** 8:19  
**sunlight-lit** 11:7  
**sunset** 3:5,15 18:16  
 19:12 21:10 83:22  
 84:11,14 101:1  
 103:14 121:5,13,14  
 121:16,17 147:13,16  
 189:11,11,15 195:21

210:18,21 216:20,22  
 217:3,12 224:6 228:4  
 300:13 301:15,16  
 304:16 305:3  
**sunsets** 296:13,14,17  
 299:9 303:7  
**sunsetting** 103:17  
**super** 77:14  
**supplement** 174:13  
**supplements** 174:13  
**supplies** 205:22 294:17  
**supply** 39:18 44:15  
 51:13,18 55:3 72:20  
 73:16 74:12 75:2  
 77:14 80:21 81:2  
 82:13,16 118:1 167:8  
 192:22 193:11 205:14  
 207:15  
**support** 28:11 47:5  
 54:1 91:2 94:14,22  
 96:19 117:8 125:15  
 126:7 134:15 148:12  
 235:3,10 236:19  
 242:2 269:15 271:1  
 311:12,15,16 330:2  
 330:13  
**supported** 96:12 101:3  
 110:8 125:16,20  
 126:9,15 269:9  
 310:18  
**supporting** 43:13  
 238:16  
**supportive** 78:22  
**supports** 42:7  
**suppose** 254:9  
**supposed** 37:12 226:1  
**surface** 158:10  
**surfaces** 88:17 162:20  
 163:10  
**surgery** 109:22 113:20  
 119:10  
**surgical** 85:2,22  
**surprise** 11:18 308:20  
**surprised** 111:9 277:20  
 310:6  
**surprising** 308:2  
**survey** 202:17  
**suspect** 57:1  
**suspended** 67:19  
**suspension** 65:21  
 71:12  
**suspensions** 66:2  
 67:22  
**sustainability** 221:2  
**sustainable** 220:6  
 231:8  
**sweetener** 58:6  
**swine** 125:11 194:4

**sympathetic** 311:11  
**sympathize** 215:4  
**synthetic** 3:13 12:18  
 14:2,9 84:16 96:16  
 97:14 104:14 124:20  
 132:11 136:19 141:4  
 142:9,18,21,22 143:4  
 145:8,19 164:7  
 217:15 224:8,20  
 225:3  
**synthetics** 142:12  
 154:13 156:7 158:7  
 161:1 162:18 168:8  
 174:5 176:13 178:10  
**syrops** 152:16  
**system** 9:8,10,21 29:19  
 31:1,3 32:14 34:1,6,6  
 34:22 35:10 60:1,15  
 60:19 61:11 66:20  
 67:11 69:16 70:21,22  
 71:6,9,13,22 82:17  
 138:13 139:17 141:19  
 167:9 169:19 170:13  
 181:5 185:17 193:9  
 236:6 237:1 242:2  
 270:6 281:7 312:3  
 316:9  
**system-level** 70:19  
**system-wide** 72:5  
**systemic** 139:6  
**systems** 6:7 9:19 11:7  
 17:14 68:12 97:12  
 107:15 169:21 199:15  
 199:15 312:6

---

**T**


---

**table** 38:6 46:7 81:16  
 81:21 266:2 278:10  
 314:20  
**tack** 40:5 93:18  
**tackle** 82:19  
**tackling** 40:14  
**taken** 69:14 139:8  
 310:7  
**takes** 84:1 197:21  
 241:19 304:18  
**talk** 64:12 65:10 77:21  
 88:12 106:4,5 134:18  
 144:11 159:13 173:21  
 192:20 240:5 241:4  
 245:6 276:18 288:6  
**talked** 8:18 19:17 89:8  
 110:20 204:3 206:19  
 316:2  
**talking** 46:20,21 50:6  
 58:5 83:2,3,4 173:13  
 203:14 223:20 232:2  
 237:22 245:2 255:13

273:12 275:6 279:11  
297:10  
**tallied** 322:16  
**tally** 319:5,15  
**tamarind** 300:7  
**TAP** 192:9  
**target** 296:3  
**tartar** 218:5  
**tartare** 176:20  
**tartrate** 3:20 4:3 176:11  
176:15,18 177:9  
189:14 217:10 218:16  
**task** 115:14 289:17  
325:16  
**Taskforce** 43:5  
**tasks** 325:11  
**TBD** 247:3 255:12  
256:1 259:11 282:9  
283:10 286:3  
**TBDs** 276:22 282:15  
286:5  
**tea** 107:13  
**team** 6:13 260:17  
297:17 324:11 325:5  
329:8  
**tear** 138:9,18  
**teat** 85:3,17,21 303:3  
**technical** 18:21 29:14  
85:6 92:20 100:14  
104:3,12 124:16  
136:11,14 137:12  
148:2 152:11 154:14  
156:8 158:12,13  
161:3 163:5 174:8  
176:15 178:12 179:13  
195:17 211:1 225:6  
226:21 228:4 247:19  
260:19 307:16  
**technique** 253:4 274:15  
**techniques** 261:12,16  
274:15 276:6  
**technologies** 18:19  
57:18 243:16 256:12  
262:12 268:19 276:17  
277:9 281:9 282:8  
**technology** 57:21 207:1  
252:3 262:10 263:13  
268:17 276:19  
**tell** 58:4 69:17 70:3  
119:19 195:9 198:3  
278:12  
**telling** 54:10 249:10  
**temperamental** 280:4  
**temperatures** 85:18  
**ten** 14:14,17 244:13  
285:13 316:2  
**tendency** 60:16  
**tends** 115:2

**tens** 33:14  
**tenure** 141:1  
**term** 45:12 222:1,2  
313:17 317:22  
**terminology** 4:9 274:1  
289:14 303:21  
**terms** 6:11 8:15 10:1  
32:6,7 43:19 44:11,16  
45:14 57:16 66:22,22  
117:7 173:12,15,20  
191:4 209:1,7 221:13  
232:17 235:2 240:2  
245:3 247:20 251:14  
251:14 256:6,22  
264:3 270:14,17  
273:22 274:4,16  
290:6 293:3,11 318:2  
327:18,21 328:1,1  
329:2  
**testimony** 192:17  
**testing** 56:22 57:9 58:2  
58:9 66:15  
**tests** 57:5 211:6  
**text** 41:7  
**thankful** 233:3  
**thanking** 329:3  
**thanks** 5:18 22:20 25:6  
31:8 39:16 58:16 83:7  
85:7 88:11 90:19  
92:21 100:15 103:12  
109:13 113:13 124:21  
148:3 154:15 156:9  
158:15 159:16 163:6  
225:22 228:12 290:8  
291:22 305:11 329:16  
330:10  
**that'd** 240:6  
**the-ground** 240:16  
**theme** 79:17 270:16  
**therapeutic** 92:19 93:4  
**thereof** 318:6  
**Thicke** 1:18 6:18 8:6,10  
10:15 11:10,22 12:16  
15:1 17:4 18:5 19:16  
21:7,20 39:1 47:16  
52:12 55:21 87:14  
90:10 92:8 96:10 99:8  
101:19 103:4 106:13  
108:19 111:3,13  
112:17 116:14 117:15  
120:4 122:13 135:10  
136:21 138:15 140:9  
146:12 149:5 151:9  
154:4 155:21 157:20  
160:14 162:8 167:18  
173:1 176:1 177:19  
181:17 186:12,21  
188:10 190:12 201:6

210:4 216:5 219:1  
243:4 281:2 285:10  
287:16 295:22 296:16  
299:11 304:16 305:15  
306:21 307:2 313:20  
320:21  
**thickener** 202:11,20  
**thin** 17:1  
**things** 17:10,13,17 20:1  
21:5 28:17 29:2,7  
35:19 48:15 59:14,19  
63:8 69:2 71:21 76:15  
79:9 81:13 88:18  
107:13,14 127:16  
129:19 132:16 143:21  
156:18 158:21 168:8  
193:4 195:22 196:5  
197:14 237:10 241:21  
249:5,14 253:9  
254:15,17 264:20  
268:7,9 277:12,18  
278:11 280:11 282:16  
283:5 294:18 296:6  
299:14 302:13 306:5  
307:12 314:8,15  
315:20 316:3  
**third** 317:18  
**Thirdly** 100:9  
**Thirteen** 135:21  
**thought** 9:1 21:18 22:6  
25:12 26:1 63:18  
117:22 141:13,18  
142:7 207:14 219:20  
220:13,20 222:9  
223:16 227:14 231:15  
235:20 246:1,3  
**thoughtful** 5:19 169:22  
314:7  
**thoughtfully** 199:6  
**thoughtfulness** 306:3  
**thoughts** 6:14 28:3,7,9  
56:7,10,16 58:19  
130:3 297:18  
**threatened** 24:5 30:18  
**three** 6:8 30:2 60:11  
89:14 115:5 139:12  
148:11 172:9 190:22  
211:12 219:14 221:17  
224:18 244:13,18  
266:1 269:14 276:6  
276:22 282:7 283:5,8  
317:11  
**three-fold** 61:1  
**threw** 257:12  
**thrilled** 54:16  
**throughput** 59:6  
**throw** 120:15 127:9  
132:1 208:16 265:14

**Thursday** 1:7 5:8 84:5  
**thymol** 107:9 303:1  
**ticking** 280:1  
**ticks** 125:9 127:5  
**tie** 239:1 320:5  
**tied** 141:16  
**tightening** 311:6  
**tightly** 70:1  
**till** 254:8  
**tilled** 29:20,22 30:2,6  
37:2  
**times** 34:3 46:19 59:3  
60:12 111:14 142:5  
206:18 217:13 248:16  
290:19 294:7 316:2,4  
**timing** 256:6  
**timing-wise** 259:22  
**tissue** 138:20 139:2,3  
**to-** 267:20  
**to-be-** 261:3 282:15  
**to-be-determined**  
262:2 267:19  
**tocopherol** 225:15  
**tocopherols** 4:4,5  
224:1,2,7  
**today** 43:17 191:19  
221:12 234:9 265:9  
267:6 281:10 290:6  
306:17 308:13 328:7  
329:5  
**tofu** 174:11 175:3 322:8  
**tolazoline** 3:8 99:17,20  
102:13  
**told** 278:14 314:3  
**Tom** 1:9,11 6:18 10:16  
12:16 22:20 26:19  
39:16 45:1,3 47:11  
55:4 57:22 63:17 72:8  
80:7 83:13 98:10  
102:11 118:12 119:21  
121:8 134:20 155:2  
179:18,18 182:19  
185:4,13 188:17,20  
193:22 197:12 200:17  
200:20 204:2 207:12  
209:12 211:3 213:15  
215:9,22 218:14  
223:22 225:22 228:12  
228:14 231:11 232:1  
239:11 246:15 249:7  
249:17,22 258:2  
263:4 271:21 273:4,9  
291:22 301:1 321:1  
322:17 328:21 329:13  
329:15  
**Tom's** 186:8 196:18  
249:1,16 271:18  
321:14

**tomorrow** 57:19  
**ton** 10:10  
**tool** 57:10 104:21 116:3  
 119:9 131:18 133:12  
 134:19 159:8 166:17  
 171:20  
**toolbox** 93:16 97:10,16  
 97:19 98:1 115:2  
 126:2 131:19 134:19  
 159:9  
**tools** 28:19 30:16 34:15  
 38:1 97:6,13,22  
 120:21 126:1 139:17  
**top** 13:21 80:18,19  
 277:8  
**topic** 6:1,10 22:21  
 50:19 51:21 170:1  
 174:1 254:5 256:8  
 259:9 268:16 289:3  
 294:14  
**topical** 103:22 108:7  
 136:8 137:10 139:9  
**topically** 106:21,22  
**topics** 67:6 257:1 282:7  
**torn** 185:5 263:18  
**toss-up** 258:20  
**total** 306:19  
**totality** 225:11  
**totally** 18:3 36:12,20  
 68:11 70:17 127:8  
 278:9 279:1  
**touch** 159:16  
**touched** 43:4  
**tough** 293:22  
**town** 19:20  
**toxic** 86:3 164:12  
**toxicant** 165:3  
**TR** 19:15 20:11 133:18  
 192:9  
**traceback** 67:3  
**track** 54:19 82:12  
 263:10 302:11  
**tracking** 57:6,16 60:15  
 60:18 63:10  
**traction** 234:22  
**tractor** 316:4  
**trade** 94:15 194:13  
 195:9 196:3 197:18  
 202:15 205:16 211:15  
 211:17,17  
**trade-off** 215:2  
**trade-offs** 164:11  
**traditional** 202:6  
**tragacanth** 301:3  
**trail** 48:19,21 77:14  
**trained** 42:4  
**training** 29:14 31:18  
 32:7 34:8,18 42:9

54:8 67:5,7,7 200:6  
 200:15  
**trainings** 199:22  
**transcriptionist** 330:3  
**transcripts** 322:15  
**transformed** 208:3  
**transition** 125:22  
 227:13 318:8  
**transitioning** 53:15  
**translates** 279:19  
**transparent** 141:20  
**travel** 278:14  
**treat** 94:5 95:18 104:15  
 106:21,22 116:22  
**treated** 118:10  
**treatment** 95:20 103:22  
 108:7 110:11 136:8  
 137:10,14 139:9  
 141:17 145:8 158:9  
**treatments** 84:21 296:8  
**tree** 15:13 107:13  
 217:20  
**tried** 206:11 224:11  
**tripled** 60:9  
**tropical** 202:4  
**true** 18:22 22:6 133:21  
 197:20 256:2 294:22  
**truly** 5:22 116:11  
 234:21  
**trumpet** 255:2 306:7,7  
 315:4 321:19  
**trust** 62:3 76:12 79:4,6  
 79:13  
**trusting** 182:12  
**truthfully** 244:1  
**truthing** 32:14  
**try** 27:12 30:13 72:4  
 73:16 81:8 84:9  
 193:18 194:16 197:17  
 203:15 207:9 221:19  
 221:22 222:6,10  
 235:13 247:13 260:12  
 278:20 290:15 294:16  
**trying** 25:13 48:21 53:5  
 54:16 58:11 63:1 69:1  
 118:9,21 129:17  
 144:19,20 181:8  
 209:1 215:5 223:6  
 230:17 235:10 263:10  
 281:5 283:6 288:10  
 290:22 291:1  
**tubers** 202:3  
**Tucker** 2:18 5:15 50:17  
 51:16 52:9 65:13  
 70:15,17 78:3 82:21  
 123:15 297:14 299:1  
 305:11 327:11 329:3  
 329:12 330:16

**Tucker's** 329:10  
**turkeys** 125:10  
**turn** 29:10 34:14 83:13  
 327:12 329:10  
**turned** 220:19  
**turning** 34:15 243:21  
**tweak** 281:20  
**tweaks** 42:17 304:7  
**two** 6:19 9:2 17:14 47:7  
 52:20 94:10 98:5  
 101:4,15 110:13  
 115:6,7 119:19 120:1  
 135:21 141:9,14  
 148:11 150:10 154:19  
 176:21 194:10 199:22  
 204:5 212:18 226:15  
 230:14 233:5 239:19  
 240:13 244:13 248:7  
 252:10 256:22 261:8  
 265:14 268:3 281:16  
 286:1 296:11 298:11  
 299:15 300:3 307:12  
 316:4,16 320:2 328:5  
 328:16  
**two-step** 246:5  
**two-thirds** 304:19  
**type** 10:19 198:22  
 241:6 247:19  
**types** 6:8 16:13 78:10  
 79:12  
**typically** 30:8 195:17  
 297:22

---

**U**


---

**U.S** 60:4 98:6 167:9  
 187:3 233:9 238:15  
**ultimate** 230:14  
**ultimately** 29:4  
**unanimous** 96:4 179:2  
 185:3 265:7  
**unanimously** 161:13  
 175:1  
**unaware** 121:21 327:7  
**uncertainty** 127:12  
**uncertified** 43:10 44:13  
**unclear** 93:8 250:21  
 316:3  
**uncomfortable** 321:8  
**undercut** 79:13  
**underlying** 95:14  
**understand** 14:18 42:9  
 70:6 77:17 97:21  
 118:3 120:13 130:9  
 130:13 142:20 164:17  
 166:6 184:8 193:14  
 195:11 196:13 200:7  
 230:21 236:22 246:22  
 247:20 256:19 268:2  
 272:10,13  
**understanding** 26:13  
 63:6 69:16,20 132:14  
 173:16 213:12 251:11  
 257:4,21 258:18  
 282:19  
**understands** 230:12  
**underway** 36:5 71:5  
**unease** 64:18  
**uneducated** 249:21  
**uneven** 248:11  
**unfortunate** 101:20  
**unfortunately** 7:5 72:16  
 73:13 81:14 82:6,9  
 171:1 185:18 186:1  
 273:14  
**uniform** 13:4  
**unintentionally** 117:3  
**Union** 12:2 295:15  
**unique** 223:8 268:16  
**United** 1:1 94:11 197:5  
 213:7  
**universal** 244:21  
**universally** 91:1  
**unknown** 185:19  
**unquote** 62:6  
**unrelated** 68:20  
**unresolved** 306:13  
**unsuspecting** 118:2  
**upcoming** 291:20  
**update** 4:4 18:8 19:14  
 65:17 223:22 226:4,6  
 249:4  
**updated** 176:16 253:3  
**updates** 325:14  
**urge** 52:13  
**urgency** 278:11 280:6  
**usage** 117:20 187:4  
**USDA** 6:9 15:9 83:4  
 230:8 231:5 233:13  
 238:15 247:16 256:10  
 260:17 271:7 307:20  
 308:19 309:7,14  
 310:7,20 311:4,6  
 314:18  
**USDA's** 305:16  
**use** 3:12 10:12 13:12  
 36:16 37:3 45:14 76:2  
 84:17 85:22 86:5  
 88:21 92:18 93:4,16  
 95:9 97:16 99:21  
 100:4,5,6,19 101:5,7  
 106:13,19 107:15  
 109:10 113:9 116:16  
 117:1,9 119:3,21  
 125:5 128:20 129:21  
 130:20 131:2,2  
 133:12 134:13 136:9

136:9,22 137:6,9  
 139:11 141:4 142:17  
 145:19 156:18 164:12  
 164:13 165:12,15,19  
 168:10 169:2,7 171:4  
 173:16 178:12,17  
 181:7,8 182:2 183:5,7  
 186:9 202:14,19  
 203:15 205:5 209:9  
 214:17,17,18 224:9  
 227:20 228:10 247:11  
 266:18 277:1 318:14  
 319:18 321:13 324:16  
**useful** 23:15 57:5 58:2  
 85:16 91:6 107:14  
 110:10 115:1 238:7  
 239:7 241:12 258:1  
 269:6  
**user-friendly** 229:19  
 230:1  
**users** 211:15 230:14  
**uses** 85:3 119:2 130:4  
 136:15 137:4 158:14  
 178:16 215:1  
**usually** 77:18 106:5  
 134:2 169:8  
**utensils** 158:21  
**uterus** 95:13,16  
**utilized** 17:19

---

**V**


---

**vaccines** 303:8  
**valid** 95:8 270:15  
**Valley** 94:11 96:11  
 117:7 294:14,16  
**valuable** 29:6 52:1 63:5  
 104:21 118:4 313:13  
 327:21 328:4,14  
**value** 306:6 308:3  
**variation** 35:21 36:15  
**variety** 94:7 178:16  
 185:7 207:21 222:7  
**various** 80:2 129:19  
**vast** 23:18 24:13  
**vegan** 194:20  
**vegetable** 310:5  
**vegetables** 36:10  
 309:17  
**vegetarian** 183:16  
 194:20  
**vent** 134:1  
**verbage** 143:19  
**verbal** 4:4 223:22 226:4  
**verification** 28:14  
**verify** 34:6 312:4  
 319:16  
**Vermont** 117:9  
**versa** 187:3 239:8

**version** 323:19  
**veterinarian** 85:3 100:1  
 100:6 118:3 119:7  
 200:3  
**veterinarians** 116:19  
 125:21 200:1  
**veterinary** 100:20  
 101:11 110:11  
**vice** 1:12 187:3 239:8  
 313:12 317:11 318:15  
 318:18 319:3,7  
 322:20,21 323:10  
 324:8,9,21  
**view** 265:22 266:7  
**views** 207:11  
**vinegar** 86:3 168:10  
**Virginia** 295:1,5  
**virtually** 215:13  
**vision** 310:12,21  
**visit** 76:6 308:20  
**vitamins** 174:13  
**VOF** 117:8  
**volunteer** 241:20  
**volunteered** 237:4  
 238:9  
**vote--** 48:11  
**voted** 86:7 93:2 101:14  
 103:14 110:12,14  
 115:6 120:17 161:12  
 174:22 191:20 232:8  
 268:4,8 301:13  
 304:22  
**votes** 4:11 39:14 47:7  
 48:8 55:22 87:16  
 90:13 92:12 99:13  
 101:16 103:10 105:5  
 109:4 113:3 116:1  
 122:22 135:20 139:22  
 140:20 147:2 148:11  
 148:17 149:18 152:1  
 154:5 156:1 158:1  
 160:18 162:13 173:7  
 176:8 178:5,6 189:11  
 190:21 201:16 210:15  
 210:16,16 216:17,18  
 219:12 243:5 285:12  
 287:19 291:14 318:11  
 318:11 319:15,21,22  
 320:1,11 322:17  
 325:6  
**voting** 38:9,20 47:12  
 55:5 87:1 89:20 91:19  
 98:8,19 102:16  
 108:11 112:9 115:5  
 115:14 121:10 122:8  
 135:5 140:5 146:2,8  
 149:2 151:8 153:11  
 155:7 157:7 160:3

161:20 172:14 175:14  
 177:12 182:18 185:10  
 188:19 190:5 200:22  
 204:22 209:21 216:1  
 218:22 242:10 266:13  
 269:20 282:7 284:16  
 286:11 287:3,4 318:1  
 321:17 324:20

---

**W**


---

**wait** 45:7 50:10 237:11  
 268:3  
**waiting** 72:9 267:21  
 301:18  
**walk-** 104:8  
**walking** 133:22  
**walks** 203:20  
**Wall** 21:15,21,22  
**wanted** 5:11 16:2 19:16  
 21:11 42:15 44:22  
 52:13,15 63:19 79:3  
 79:16 93:12 102:3  
 105:10,11 110:19  
 118:13 132:1 159:14  
 168:5 208:9 229:12  
 230:6 244:22 246:2,3  
 256:6,13,15 286:19  
 288:20 292:21 293:22  
 299:9,14 314:4,11  
 315:2 328:10  
**wanting** 85:15 127:4  
**wants** 180:13 260:11  
 271:10 298:14 302:2  
 308:5  
**warehouses** 11:3  
**wash** 138:19,22 158:19  
**Washington** 312:14  
**wasn't** 116:4,11 179:15  
 184:7 215:14 227:14  
 227:20 229:16 250:22  
 255:7 261:7,8 274:4  
 298:6,8  
**waste** 167:6  
**water** 1:9 88:5,7,17  
 158:19 162:21 163:1  
 167:6 174:7 178:20  
 293:15,17,17 294:17  
**watercress** 222:14  
**way** 20:15 26:22 27:10  
 27:11 34:16 53:12  
 59:13 62:13 128:7  
 129:18 172:2 185:6  
 185:18,20 193:9,10  
 195:8 198:9,11 199:5  
 214:1 229:18 233:2  
 235:14 241:13 242:1  
 242:1 246:5,18 263:3  
 270:5 281:6 285:21  
 310:11 314:7 316:10  
**ways** 40:5 72:19 73:8  
 73:14,17 78:14,16  
 81:18 94:8 142:15  
 144:22 194:11 230:17  
 230:20 234:13 265:17  
 268:16 281:11  
**weak** 308:11  
**weaken** 311:9  
**weaknesses** 25:9  
**web** 65:5 328:5  
**webinar** 43:3 234:2,19  
 235:21  
**webinars** 328:6  
**website** 65:18 67:15  
 136:17  
**Wednesday** 84:4  
**weed** 290:21  
**week** 10:4 75:14 134:16  
 278:13,17 290:6  
 303:5 329:6  
**week's** 327:16  
**weeks** 10:14  
**weigh** 9:6 127:19  
 280:10  
**weighing** 127:3  
**weight** 241:18  
**welcome** 91:6 186:2  
 289:3 330:13  
**welfare** 76:8 110:18  
 127:3 131:1 132:6  
 134:4 308:11  
**went** 7:19 22:3 33:10  
 37:10 54:10 85:13  
 93:18 123:21 227:6  
 227:10 228:20 236:16  
 291:14 330:19  
**weren't** 273:2,12  
 274:11 288:19  
**West** 294:22  
**wettable** 130:18  
**whatsoever** 271:2  
**whichever** 233:8  
**whispered** 46:12  
**white** 259:4  
**WhiteWave** 94:12  
**Wholesalers** 49:12 81:7  
**wide** 27:21 79:7 222:7  
 250:20  
**widely** 19:2 120:5,5  
 150:7 230:18 233:1  
**widely-used** 115:3  
**widespread** 32:21  
**wild** 24:7 28:20 223:4  
 223:10  
**wildlife** 24:3  
**willing** 267:2,4 298:3  
 310:15

**wine** 150:7,16 322:8  
**winemakers** 218:3  
**winemaking** 176:19  
**winter** 67:8 292:4  
**Wisconsin** 85:18  
 199:21  
**wish** 273:1  
**wishy-washy** 279:18  
**withdraw** 320:13  
**withdrawal** 109:10  
 110:3 113:10 114:2  
 141:10,15  
**withdrawn** 114:17  
**withholding** 110:21  
 111:14  
**withstand** 17:2  
**wonder** 62:8  
**wonderful** 143:6 271:5  
 329:14  
**wondering** 111:6 180:8  
 253:11 270:4 279:8  
 281:22 283:13  
**wood** 16:17  
**word** 46:2,4 95:6 142:5  
 215:13,13 227:8  
 233:8 251:10 274:2  
 280:18 316:15  
**wording** 24:15 25:10  
 47:10 143:22  
**words** 256:6 299:10  
 305:8 313:6  
**work** 4:12 5:22 6:10  
 22:3,14 24:11 25:2,16  
 25:18 26:16 28:4  
 31:20 40:13 43:12,14  
 43:22 45:4 49:16 50:7  
 50:8,19 51:2,8,14  
 52:10,13 53:8 56:18  
 58:14 75:1,3 79:1  
 80:12 94:1 101:22  
 131:14 143:3 165:15  
 166:12 168:6 173:14  
 174:19 189:3,16  
 196:7 197:6 198:22  
 220:7 224:3,5 226:8  
 226:12,17 228:8,10  
 232:13 243:11 245:22  
 246:13 247:4,8  
 253:15 254:16 260:3  
 260:22 265:19 276:3  
 283:20 288:1 291:16  
 291:20 292:3,4,21  
 293:3,4 295:17 296:9  
 297:9,12 298:3  
 303:20 307:7 327:15  
 327:16,19 328:2  
 329:4,7 330:6  
**worked** 49:4,5 61:4

71:17 109:19 113:18  
 127:17 273:1 296:7  
**worker's** 127:21  
**working** 42:22 51:7  
 52:14 57:20 72:1,4  
 74:1,2,3 98:4 118:2  
 138:5 200:2 209:2  
 252:5 256:10 258:18  
 300:9,11 303:17  
 305:18 308:9 313:1  
 328:11,12 329:1  
**works** 71:18 192:6  
 193:9  
**world** 57:13 167:11  
 196:19 231:20 236:9  
 271:8  
**worried** 56:9  
**worry** 31:12 167:11  
**worst** 128:16  
**worth** 20:12  
**wouldn't** 58:7 102:8  
 111:10 119:11,15  
 128:13 254:9 257:19  
 265:2 268:3 272:7  
 273:7 277:10 310:18  
**wound** 137:1,14  
**wounds** 137:11  
**woven** 15:6 17:2  
**wrap** 36:18  
**Wrapping** 210:20  
**wraps** 83:11 228:13  
**wrench** 127:10  
**wrestle** 18:2 296:13  
**write** 27:1 143:21 144:9  
 321:13 324:17  
**writing** 252:22 268:1  
**written** 99:22 100:6  
 125:14 206:22 212:15  
 220:2 234:2  
**wrote** 22:4 26:22

---

**X**


---

**X** 69:18  
**xanthan** 300:19  
**Xylazine** 100:8,20  
 101:21

---

**Y**


---

**Y** 69:18  
**yada** 273:17,17,17  
**yam** 202:4  
**year** 30:9 52:22 53:3  
 58:20 130:22 199:22  
 200:5 202:12 230:3  
 232:11 234:20 310:17  
 314:13 318:10 322:18  
 327:4 329:1 330:12  
**year's** 229:9

**years** 14:14,17 15:13  
 15:15 17:3 30:3 33:20  
 36:2 52:20 60:6,10,12  
 112:2 141:9 154:19  
 214:9 229:19,22  
 233:5 239:20 243:12  
 268:3 281:16 299:15  
 305:15 307:13 315:4  
 315:6 328:16,16  
**yellow** 318:13,15 319:3  
 324:16  
**yes-vote** 47:14 55:6  
 86:21 89:18 91:17  
**yeses** 286:5  
**yesterday** 35:17 42:9  
 65:17 66:17 70:20  
 71:15 133:3 205:19  
 212:9 297:5  
**Yikes** 317:5  
**yogurt** 211:21

---

**Z**


---

**Z** 69:18  
**Zea** 11:20 272:22  
**zero** 13:14 86:10 99:14  
 103:11 109:5 110:12  
 110:13 113:4 135:21  
 140:21 147:3 148:16  
 149:19 150:18 152:2  
 153:3 154:6 156:2  
 158:2 160:19 162:14  
 171:16 173:8 176:9  
 178:6 216:18 219:13  
 219:13,13 243:6  
 287:20  
**zero-calorie** 202:8  
**zero-carb** 202:9  
**Zika** 164:15  
**zinc** 107:7 296:4

---

**0**


---

**0** 39:15 48:9 56:1 87:16  
 90:13 91:10 92:12  
 96:2,3  
**0.2** 239:4

---

**1**


---

**1.2** 52:21  
**1.65** 60:11  
**10:00** 83:18  
**10:30** 123:9  
**10:31** 123:21  
**10:45** 123:10  
**10:47** 123:22  
**100** 36:2 60:6 105:15  
 225:8 309:22  
**103** 3:9  
**109** 3:9

**11** 205:10 206:2,7  
**113** 3:10  
**11th** 136:5  
**12** 190:22 219:13  
**12:38** 228:20  
**12:40** 228:15  
**124** 3:11  
**135** 3:12  
**14** 201:17  
**141** 3:13  
**147** 3:15  
**15** 39:15 48:9 56:1  
 87:17 90:14 92:13  
 103:11 109:5 113:4  
 123:9 140:21 149:19  
 152:2 154:6 156:2  
 158:2 160:19 162:14  
 173:8 176:9 178:6  
 216:18  
**15,000** 308:16  
**150** 3:16  
**152** 3:16  
**154** 3:17  
**156** 3:17  
**158** 3:18  
**15th** 103:15 104:11  
 121:15 217:1  
**160** 3:18  
**162** 3:19  
**173** 3:20  
**176** 3:20  
**178** 3:21  
**18** 300:13  
**191** 3:21  
**1995** 152:12 154:15  
 156:9  
**1st** 124:12

---

**2**


---

**2** 1:7  
**2:00** 228:17  
**2:03** 228:21  
**20** 15:13  
**20-some** 137:15  
**200,000** 308:7  
**2000** 54:7  
**2002** 100:15  
**2005** 92:21  
**2006** 161:4 163:6  
**2008** 158:13  
**201** 3:22  
**2010** 148:3  
**2012** 229:17  
**2013** 158:15  
**2013-2018** 305:17  
**2014** 18:15  
**2015** 18:15 85:7 100:21  
 104:3 110:1 113:21

150:13 161:12 174:22	<b>292</b> 4:12
179:13 211:2 224:5	
226:10,12,14 301:13	<b>3</b>
<b>2016</b> 110:6 124:12	<b>3:58</b> 330:19
136:5 174:8 178:13	<b>30,000-cow</b> 309:3
226:14 273:20 274:10	<b>303</b> 41:9,22
274:12 275:3,12,14	<b>307</b> 41:21
275:16	<b>318</b> 4:14,16
<b>2017</b> 1:5,7 4:9 84:11	<b>327</b> 4:18
176:16 242:8 275:16	<b>330</b> 4:20
<b>2018</b> 296:3	<b>37220-17-0</b> 201:22
<b>2019</b> 3:5,15 210:21	<b>4</b>
<b>2020</b> 296:16 303:7	
<b>2022</b> 103:15,17 121:15	<b>5</b>
217:1,4 305:4	
<b>205</b> 100:5	<b>50</b> 238:21
<b>205.101(b)(1)</b> 41:8	<b>50-billion-dollar</b> 308:4
<b>205.600(b)</b> 122:3	<b>50,000</b> 53:3
<b>205.600(b)(1)</b> 98:16	<b>500</b> 60:6
<b>205.603</b> 103:21 124:15	<b>530</b> 100:2
135:3 136:7 140:2	<b>59-98-3</b> 99:20
<b>205.603(a)</b> 98:12 99:19	<b>6</b>
102:13 152:8	
<b>205.603(b)</b> 108:6 122:1	<b>60</b> 60:3
<b>205.605</b> 147:17 150:1	<b>606</b> 195:8,17,22 196:10
158:6	197:14,20 208:5,11
<b>205.605(a)</b> 148:21	208:19 218:4
151:5 153:8 155:4	<b>7</b>
156:6 157:3 174:19	
<b>205.605(b)</b> 4:4,5 159:22	<b>7</b> 91:9 96:2 98:15 100:4
161:17 172:9 174:5	122:3
174:18 175:11 176:14	<b>7-2</b> 86:9
177:9 178:10 188:16	<b>70</b> 60:2
190:3 218:18	<b>8</b>
<b>205.606</b> 191:10 200:19	
201:21 209:15 215:21	<b>8</b> 3:2
218:18	<b>8:30</b> 1:9 84:5
<b>205603</b> 84:15 88:2	<b>8:33</b> 5:2
90:18 92:17	<b>84</b> 3:6
<b>205603A</b> 86:18 89:14	<b>87</b> 3:7
91:15	<b>9</b>
<b>206.603(b)</b> 112:6	
<b>21</b> 100:2	<b>90</b> 3:7 72:14,17 109:11
<b>210</b> 4:2	111:2,8 113:10 199:9
<b>2118</b> 98:14	<b>90,000</b> 52:22
<b>2118(c)(1)(A)(ii)</b> 209:17	<b>92</b> 3:8
<b>2119</b> 98:15	<b>93</b> 59:19
<b>217</b> 4:3	<b>97</b> 199:10
<b>219</b> 4:3	<b>99</b> 3:8 31:2 59:18
<b>224</b> 4:5,6	
<b>226</b> 4:6	
<b>229</b> 4:9	
<b>23</b> 3:4 33:20	
<b>23rd</b> 315:10 318:9	
<b>243</b> 4:9	
<b>245</b> 1:9	
<b>261</b> 4:10	
<b>291</b> 4:11	

C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Fall 2017 Meeting

Before: USDA/NOSB

Date: 11-02-17

Place: Jacksonville, FL

was duly recorded and accurately transcribed under my direction; further, that said transcript is a true and accurate record of the proceedings.

  
-----  
Court Reporter

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701