

**National Organic Standards Board
Crops Subcommittee
Petitioned Material Checklist - Calcium Sulfate (synthetic)
January 6, 2015**

Summary of Proposed Action:

The National Organic Standards Board (NOSB) received a petition from the American Coal Ash Association to add synthetic calcium sulfate (gypsum) to the National List of Approved Substances at §205.601. This substance is also known as flue gas desulfurization (FGD) gypsum, with the source being the FGD systems installed to control sulfur dioxide emissions from coal-fired power plants.

Background:

The petition for calcium sulfate was sufficiently complete so that the subcommittee chose not to request a Technical Report. The petition raised two key points. First, FGD gypsum is a by-product of energy production and not all of this by product is able to be used. Thus, unused FGD gypsum ends up in landfills. Secondly, accessibility of mined gypsum in states where it is not mined is an important barrier for farmers, as it is difficult to acquire it at a reasonable price.

There is no doubt that the use of gypsum is beneficial for many soils and crops. It is a very abundant mined mineral, with mines in more than 20 states, and most mining concentrated in the western United States. Other non-synthetic substances can easily substitute for gypsum if necessary, including limestone, bone meal, and elemental sulfur, as well as organic matter from compost or cover cropping.

The petition states that the process used to produce FGD gypsum produces a relatively pure product, but it does not say what contaminants might be in the product. Meanwhile, an Environmental Protection Agency (EPA) factsheet says, “[T]he amount and types of trace materials and unreacted sorbents found in the gypsum can vary among power plants and among mines. If you are considering using FGD gypsum products as a soil amendment, it is appropriate that the chemical analysis of the material be provided by all commercial sources to support decision-making in their use, as States may have regulations and standards that need to be followed.”¹ A study by the Electric Power Research Institute found the following elements in FGD gypsum in varying concentrations: aluminum, arsenic, boron, barium, beryllium, calcium, cadmium, cobalt, chromium, copper, iron, mercury, potassium, lithium, magnesium, manganese, molybdenum, sodium, nickel, phosphorus, lead, sulfur, tin, selenium, silicon, strontium, titanium, vanadium, and zinc.²

Based on this evidence demonstrating the potential for contamination, the NOSB, in following EPA’s recommendation, would need to specify allowable sources or allowable levels of contaminants if the Board chooses to approve the petition. Nevertheless, due to the many alternatives to synthetic gypsum that exist, the subcommittee believes that it is not essential for organic farming and that this criterion out-weighs the recycling benefits that are associated with the use of FGD gypsum.

¹ EPA factsheet, Agricultural Uses for Flue Gas Desulfurization (FGD) Gypsum.
<http://nepis.epa.gov/Exe/ZyPDF.cgi/P10011I9.PDF?Dockey=P10011I9.PDF>

² Electric Power Research Institute, 2011. Composition and Leaching of FGD Gypsum and Mined Gypsum. (p.A-1, 2; p.33-34)
<http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=00000000001022146>

Evaluation Criteria

- 1. Impact on Humans and Environment
- 2. Essential & Availability Criteria
- 3. Compatibility & Consistency

Criteria Satisfied?

- Yes No N/A
- Yes No N/A
- Yes No N/A

Substance Fails Criteria Category: 2, 3

Subcommittee Action & Vote

Classification Motion: Motion to classify Calcium Sulfate, produced by the flue gas desulfurization (FGD) process as petitioned as synthetic

Motion by: Zea Sonnabend

Seconded by: Harold Austin

Yes: 6 No: 0 Abstain: 0 Absent: 1 Recuse: 0

Listing Motion: Motion to add Calcium Sulfate, produced by the flue gas desulfurization (SGD) process as petitioned to 205.601

Motion by: Zea Sonnabend

Seconded by: Harold Austin

Yes: No: 6 Abstain: 0 Absent: 1 Recuse: 0

Proposed Annotation (if any): none

Approved by Zea Sonnabend, Subcommittee Chair, to transmit to NOSB January 6, 2015

NOSB Evaluation Criteria for Substances Added To the National List - Crops

Category 1. Adverse impacts on humans or the environment? Calcium Sulfate - synthetic

Question	Yes	No	N/A	Comments/Documentation (TAP; petition; regulatory agency; other)
1. Is there a probability of environmental contamination during use or misuse? [§6518(m)(3)]		X		This substance helps prevent environmental contamination from industrial pollution.
2. Is there a probability of environmental contamination during, manufacture or disposal? [§6518(m)(3)]		X		
3. Are there any adverse impacts on biodiversity? (§205.200)		X		
4. Does the substance contain inerts classified by EPA as 'inerts of toxicological concern'? [§6517(c)(1)(B)(ii)]		X		
5. Is there potential for detrimental chemical interaction with other materials used in		X		

organic farming systems? [§6518(m)(1)]				
6. Is there a toxic or other adverse action of the material or its breakdown products? [§6518(m)(2)]		X		See page 1, paragraph 4.
7. Is there persistence or concentration of the material or breakdown products in the environment? [§6518(m)(2)]		X		
8. Would the use of the substance be harmful to human health or the environment? [§6517 (c)(1)(A)(i); §6517 (c)(2)(A)(i); §6518(m)(4)]		X		“Studies of gypsum mine workers have reported no lung fibrosis or pneumoconiosis...” (from NIEHS report included with the petition, page 21).
9. Are there adverse biological and chemical interactions in the agro-ecosystem? [§6518(m)(5)]		X		
10. Are there detrimental physiological effects on soil organisms, crops, or livestock? [§6518(m)(5)]		X		

Category 2. Is the Substance Essential for Organic Production? Calcium Sulfate - synthetic

Question	Yes	No	N/A	Comments/Documentation (TAP; petition; regulatory agency; other)
1. Is the substance agricultural? [§6502(1)]		X		
2. Is the substance formulated or manufactured by a chemical process? [§6502(21)]	X			
3. Is the substance formulated or manufactured by a process that chemically changes a substance extracted from naturally occurring plant, animal, or mineral sources? [§6502(21)]			X	
4. Is the substance created by naturally occurring biological processes? [§6502(21)]		X		
5. Is there a natural source of the substance? [§ 205.600(b)(1)]	X			There is abundant nonsynthetic gypsum.
6. Is there an organic substitute? [§205.600(b)(1)]		X		
7. Is there a wholly natural substitute product? [§6517(c)(1)(A)(ii)]	X			mined gypsum, limestone, bone meal
8. Are there any alternative substances? [§6518(m)(6)]	X			see above
9. Are there other practices that would make the substance unnecessary? [§6518(m)(6)]	X			Compost and cover cropping can have a positive effect on soils and provide some calcium and sulfur.

NOSB Evaluation Criteria for Substances Added To the National List - Crops

Category 3. Is the substance compatible with organic production practices? Calcium Sulfate - synthetic:

Question	Yes	No	N/A	Comments/Documentation (TAP; petition; regulatory agency; other)
1. Is the substance consistent with organic farming and handling? [§6517(c)(1)(A)(iii); 6517(c)(2)(A)(ii)]		X		Organic farming regulations and philosophy favor using non-synthetic substances when available over synthetic.
2. Is the substance compatible with a system of sustainable agriculture? [§6518(m)(7)]		X		Because ample non-synthetic gypsum is available, and price and convenience are not among the evaluation criteria, this substance does not appear to be compatible.
3. If used in livestock feed or pet food, is the nutritional quality of the food maintained with the substance? [§205.600(b)(3)]			X	
4. If used in livestock feed or pet food, is the primary use as a preservative? [§205.600(b)(4)]			X	
5. If used in livestock feed or pet food, is the primary use to recreate or improve flavors, colors, textures, or nutritive value lost in processing (except when required by law)? [§205.600(b)(4)]			X	
6. Is the substance used in production, and does it contain an active synthetic ingredient in the following categories: [§6517(c)(1)(B)(i);	X			
copper and sulfur compounds				
toxins derived from bacteria		X		
pheromones, soaps, horticultural oils, fish emulsions, treated seed, vitamins and minerals		X		
livestock parasiticides and medicines		X		
production aids including netting, tree wraps and seals, insect traps, sticky barriers, row covers, and equipment cleansers		X		