Guidance
Materials for Organic Crop Production

The tables included in the guidance, Materials for Organic Crop Production, NOP 5034-1, guide the organic industry regarding materials for use in organic production. The tables include materials which are considered nonsynthetic (natural), and are not required to be included on the National List.

The table of materials is consistent with the National List, and does not include materials which are prohibited under the USDA organic regulations.

This table of materials is not part of the National List, although it also includes materials on the National List. This table is not exhaustive. There may be nonsynthetic (natural) materials which are not included in the guidance, but which meet the requirements for use in organic production and handling. Producers should always check with their certifying agent regarding the use of any materials prior to their usage.

For additional information on this document, please refer to NOP 5034.

<table>
<thead>
<tr>
<th>Material</th>
<th>Type</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic Acid</td>
<td>Nonsynthetic</td>
<td>Made by oxidative or anaerobic fermentation. Solutions that contain less than 8% acetic acid are vinegar. See also, Vinegar. Reference: 7 CFR 205.105</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Nonsynthetic</td>
<td>Ethanol made by fermentation is permitted without restriction. For synthetic alcohol, see Ethanol or Isopropanol. Reference: 7 CFR 205.105</td>
</tr>
<tr>
<td>Agar</td>
<td>Nonsynthetic</td>
<td>Also called “agar-agar.” See also, Aquatic Plant Products. Reference: 7 CFR 205.105</td>
</tr>
<tr>
<td>Agricultural Substances</td>
<td>Nonsynthetic</td>
<td>Agricultural substances are permitted unless specifically prohibited at § 205.602. This includes, but is not limited to, agricultural products listed at § 205.606 of the National List. Agricultural substances used in organic crop production are not required to be certified organic. Reference: 7 CFR 205.105</td>
</tr>
<tr>
<td>Alfalfa Meal or Pellets</td>
<td>Nonsynthetic</td>
<td>Pelletization process must not involve prohibited materials. Reference: 7 CFR 205.203(c)(3)</td>
</tr>
<tr>
<td>Algae</td>
<td>Nonsynthetic</td>
<td>See Aquatic Plant Products.</td>
</tr>
<tr>
<td>Almond Hull Trash</td>
<td>Nonsynthetic</td>
<td>See Plants.</td>
</tr>
<tr>
<td>Aloe Extract</td>
<td>Nonsynthetic</td>
<td>See Plant Extracts.</td>
</tr>
</tbody>
</table>
### Amino Acids  
**Nonsynthetic**

Natural amino acids derived from plants, animals, and microorganisms that have not been genetically modified are permitted. Amino acids that have been chemically modified from their source are prohibited.

*Reference: 7 CFR 205.105*

### Ammonium Carbonate  
**Synthetic**

Permitted only for use as bait in insect traps. No direct contact with crop or soil.

*Reference: 7 CFR 205.601(e)*

### Animal By-Products and Materials  
**Nonsynthetic**

Includes parts of animals and animal by-products. May not be used in a manner that contaminates crop, water or soil with pesticide residues, heavy metals or pathogens.

*Reference: 7 CFR 205.105 & 205.203(b)*

### Aquatic Plant Products  
**Nonsynthetic or Synthetic**

*Nonsynthetic*

Natural aquatic plants and plant products, including plant products extracted with nonsynthetic materials, are allowed.

*Synthetic*

Synthetically extracted aquatic plant products are permitted as plant or soil amendments. Extraction process is limited to the use of potassium hydroxide or sodium hydroxide; solvent amount used is limited to that amount necessary for extraction. May not contain synthetic preservatives or other substances not provided for at § 205.601(j).

*Reference: 7 CFR 205.105, 205.203(c)(3), and 205.601(j)(1); NOP Policy Memo 14-I*

### Arthropods  
**Nonsynthetic**

See Biological Controls and Predators and Parasites.

*Reference: 7 CFR 205.206(b)(1) & 205.206(d)(2)*

### Ash  
**Nonsynthetic**

Ash from plant and animal sources is permitted if it has not been treated or combined with prohibited substances. Ash from burning manure is prohibited.

*Reference: 7 CFR 205.203(d)(4) & 205.602(a)*

### Attapulgite Clay  
**Nonsynthetic**

See Clay.

### Azadirachta Indica  
**Nonsynthetic**

See Neem and Neem Derivatives.

### Bacillus Species  
**Nonsynthetic**

Includes *B. amyloliquefaciens, B. cereus, B. polymyza, B. lichenformis, B. sphaericus, B. subtilis, and B. thuringiensis*.

*Reference: 7 CFR 205.105*

### Bagasse  
**Nonsynthetic**

Leftover plant stalks and fibers from sugar processing. See Food Processing By-Products.

*Reference: 7 CFR 205.203(c) & 205.203(d)(5)*

### Bark  
**Nonsynthetic**

*Reference: 7 CFR 205.203(c)(3)*

### Basalt  
**Nonsynthetic**

See Mined Minerals.

### Beauveria bassiana  
**Nonsynthetic**

*Reference: 7 CFR 205.105*
## Beeswax
*Nonsynthetic*

Reference: 7 CFR 205.105

## Bentonite
*Nonsynthetic*

See Clay.

## Biochar
*Nonsynthetic*

Biochar is biomass that has been carbonized or charred. Sources must be untreated plant or animal material. Pyrolysis process must not use prohibited additives.

Reference: 7 CFR 205.203(d)(4)

## Biodegradable Biobased Mulch Film
*Synthetic*

See Mulch.

## Biodynamic Preparations
*Nonsynthetic*

Includes horn manure spray, horn silica, yarrow flowers, chamomile, stinging nettle, oak bark, dandelion, valerian, and horsetail (equisetum) spray. Preparations containing animal manure, including horn manure spray, must comply with manure restrictions at § 205.203(c)(1).

Reference: 7 CFR 205.105 & 205.203(c)(1)

## Biological Controls
*Nonsynthetic*

Includes living organisms and viruses that are not regulated as biopesticides. Genetically modified organisms are prohibited. See also, Predators and Parasites.

Reference: 7 CFR 205.206(b)(1) & 205.602(d)(2)

## Biotite
*Nonsynthetic*

See Mined Minerals.

## Blood Meal
*Nonsynthetic*

Reference: 7 CFR 205.203(c)

## Bone Char
*Nonsynthetic*

Reference: 7 CFR 205.203(d)(4)

## Bone Meal
*Nonsynthetic*

Reference: 7 CFR 205.203(c)

## Borates and Borax
*Nonsynthetic*

Natural mined sources are permitted. For synthetic boron, see Boron Products.

Reference: 7 CFR 205.105, 205.206(b)(3), & 205.206(d)(2)

## Boric Acid
*Synthetic*

Permitted as an insecticide for structural pest control, no direct contact with organic food or crops.

For micronutrient use, see Boron Products.

Reference: 7 CFR 205.601(e)(3)

## Boron
*Synthetic*

Soluble boron products are permitted as a plant or soil amendment. Soil deficiency must be document by testing. Allowed soluble boron products include boric acid, hydrated forms of sodium tetraborate, sodium borate derivatives, disodium octaborate, and its hydrated forms, and hydrazed forms of colemanite. Boron products made from nitrates or chlorides are not allowed.

Not to be used as a defoliant, herbicide, or dessicant.

Reference: 7 CFR 205.601(j)(6)

## Brewer’s Waste
*Nonsynthetic*

Reference: 7 CFR 205.203(c)

## Calcium
*Nonsynthetic*

See Calcium Carbonate, Gypsum, or Calcium Chloride.
<table>
<thead>
<tr>
<th>Material</th>
<th>Synthetic/Nonsynthetic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium Carbonate</td>
<td>Nonsynthetic</td>
</tr>
<tr>
<td>Also called “limestone.” Naturally mined forms are allowed. May not be sourced from by-product of food or paper processing.</td>
<td></td>
</tr>
<tr>
<td>Reference: 7 CFR 205.203(d)(2)</td>
<td></td>
</tr>
<tr>
<td>Calcium Chloride</td>
<td>Nonsynthetic</td>
</tr>
<tr>
<td>Nonsynthetic sources only (from brine process). Permitted only as a foliar spray to treat a physiological disorder associated with calcium uptake. Synthetic sources of calcium chloride are prohibited.</td>
<td></td>
</tr>
<tr>
<td>Reference: 7 CFR 205.602(c)</td>
<td></td>
</tr>
<tr>
<td>Calcium Hydroxide</td>
<td>Synthetic</td>
</tr>
<tr>
<td>See Hydrated Lime.</td>
<td></td>
</tr>
<tr>
<td>Calcium Hypochlorite</td>
<td>Synthetic</td>
</tr>
<tr>
<td>See Chlorine Materials.</td>
<td></td>
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<tr>
<td>Calcium Lignosulfonate</td>
<td>Synthetic</td>
</tr>
<tr>
<td>See Lignin Sulfonate.</td>
<td></td>
</tr>
<tr>
<td>Calcium Polysulfide</td>
<td>Synthetic</td>
</tr>
<tr>
<td>See Lime Sulfur.</td>
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</tr>
<tr>
<td>Calcium Sulfate</td>
<td>Nonsynthetic</td>
</tr>
<tr>
<td>See Gypsum.</td>
<td></td>
</tr>
<tr>
<td>Cannery Wastes and Cannery Waste Water</td>
<td>Nonsynthetic</td>
</tr>
<tr>
<td>Includes peels, stems, and cores, vegetable and fruit waste processed by physical or mechanical means. Plant and animal materials may not be chemically altered by a manufacturing process unless: the resulting material is provided for under § 205.601; the chemical change is created by a naturally occurring biological process; or the chemical change is created by heating or burning biological matter.</td>
<td></td>
</tr>
<tr>
<td>Reference: 7 CFR 205.105 &amp; 205.601(j)(4)</td>
<td></td>
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<tr>
<td>Capsaicin</td>
<td>Nonsynthetic</td>
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<tr>
<td>See Plant Extracts.</td>
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<tr>
<td>Cardboard</td>
<td>Synthetic</td>
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<tr>
<td>See Newspapers or Other Recycled Papers.</td>
<td></td>
</tr>
<tr>
<td>Carnauba Wax</td>
<td>Nonsynthetic</td>
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<tr>
<td>See Plants.</td>
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</tr>
<tr>
<td>Castor Oil</td>
<td>Nonsynthetic</td>
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<tr>
<td>See Oils, Plant and Animal</td>
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<tr>
<td>Chalk</td>
<td>Nonsynthetic</td>
</tr>
<tr>
<td>See Mined Minerals.</td>
<td></td>
</tr>
<tr>
<td>Chelating Agents</td>
<td>Nonsynthetic or Synthetic</td>
</tr>
<tr>
<td>Natural chelating agents are allowed. Allowed sources of chelating agents include, but are not limited to, nonsynthetic amino acids, citric acid (to form citrate in solution), tartaric acid made from grape wine, and gluconic acid. Synthetic chelating agents are only permitted if included on the National List for that purpose.</td>
<td></td>
</tr>
<tr>
<td>Reference: 7 CFR 205.105 &amp; 205.601(j)(4)</td>
<td></td>
</tr>
<tr>
<td>Chlorine Dioxide</td>
<td>Synthetic</td>
</tr>
<tr>
<td>See Chlorine Materials.</td>
<td></td>
</tr>
</tbody>
</table>
**Chlorine Materials**  
*Synthetic*

Permitted as an algicide, disinfectant, and sanitizer, including irrigation system cleaning systems.

Allowed chlorine materials include calcium hypochlorite, chlorine dioxide, and sodium hypochlorite. Allowance also includes electrolyzed water (hypochlorous acid). Use must comply with Safe Drinking Water Act levels of 4 mg/L (4ppm) expressed as chlorine, or 0.8 mg/L (0.8 ppm) expressed as chlorine dioxide.

Residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act (SDWA). Residual Chlorine levels in the water in direct crop contact (when used pre-harvest) or as water from clearing irrigation systems applied to soil should not exceed the maximum residual disinfectant limit under the SDWA. Chlorine products may be used up to maximum labeled rates for disinfecting and sanitizing equipment or tools.


**Citric Acid**  
*Nonsynthetic or Synthetic*

Natural citric acid produced from microbial fermentation of carbohydrate substances (e.g., sugar) is permitted. Production process may not use genetically modified microorganisms. Synthetic forms of citric acid are prohibited except as specified at § 205.601.

Reference: 7 CFR 205.105 & 205.601(j)(7)

**Clay**  
*Nonsynthetic*

Includes, but is not limited to, attapulgite, bentonite, montmorillonite, kaolin, and fuller’s earth. See also, Mined Minerals.

Reference: 7 CFR 205.203(d)(2)

**Cocoa Bean Hulls**  
*Nonsynthetic*

Reference: 7 CFR 205.203(c)(3)

**Coconut Fiber**  
*Nonsynthetic*

Reference: 7 CFR 205.203(c)(3)

**Coffee Grounds**  
*Nonsynthetic*

Reference: 7 CFR 205.105 & 205.203(c)(3)

**Compost**  
*Nonsynthetic*

Composted plant materials:

- **In-vessel or static aerated pile:** Includes plant and animal materials composted through a process that establishes an initial C:N ratio of between 25:1 and 40:1 and maintains a temperature of between 131°F and 170°F for 3 days using an in-vessel or static aerated pile system. Must be made from allowed compost feedstocks.

- **Windrows:** Includes plant and animal materials composted through a process that establishes an initial C:N ratio of between 25:1 and 40:1 and maintains a temperature of between 131°F and 170°F for 15
days, during which period the composting materials must be turned a minimum of five times. Must be made from allowed compost feedstocks.

*Alternative Composting Methods:*
Compost is acceptable if (i) made from only allowed feedstock materials; (ii) the compost undergoes an increase in temperature to at least 131°F (55°C) and remains there for a minimum of 3 days; and (iii) the compost pile is mixed or managed to ensure that all of the feedstock heats to the minimum temperature for the minimum time.

*Animal Materials*
Animal materials include, but are not limited to, manure, slaughter renderings, tankage, blood meal, etc.

*Reference: 7 CFR 205.203(c)(2) & NOP 5021*

*Compost Inoculants Nonsynthetic*
May not be cultured on sewage sludge.
Synthetic growth media not approved for use as plant or soil amendments at § 205.601 must not be present in the formulated product.

*Reference: 7 CFR 205.105*

*Compost Tea Nonsynthetic*
Compost tea made from compost not meeting the requirements of § 205.203(c) or NOP 5021 is subject to restrictions of § 205.203(c)(1) for raw animal manure.

*Reference: 7 CFR 205.203(c) & NOP 5021*

*Copper, Fixed Synthetic*
For plant disease control, copper-based material must be used in a manner that minimizes accumulation in the soil and shall not be used as herbicides.

Copper products that are exempt from tolerance by the EPA [40 CFR 180.1021(b)(1)] are permitted. Allowed copper substances include Bordeaux mixture, basic copper carbonate (malachite), copper-ethylenediamine complex, copper hydroxide, copper-lime mixtures, copper linoleate, copper oleate, copper oxychloride, copper octanoate, copper sulfate basic, copper sulfate pentahydrate, cupric oxide, and cuprous oxide.

For other uses, see [Copper Products](#) and [Copper Sulfate](#).

*Reference: 7 CFR 205.601(i)*

*Copper Products Synthetic*
Permitted as a plant or soil amendment. Soil deficiency must be documented by testing. Not to be used as a defoliant, herbicide, or desiccant.

Allowed forms include copper oxide (CuO), copper sulfate (CuSO₄), copper carbonates and copper silicates. Those made from nitrates or chlorides are not allowed.

For other uses, see [Copper, Fixed](#) or [Copper Sulfate](#).

*Reference: 7 CFR 205.601(j)*

*Copper Sulfate Synthetic*
For micronutrient use, see [Copper Products](#).

For plant disease control, substance must be used in a manner that minimizes accumulation of copper in the soil.

*Use in Aquatic Rice Systems:*

For use as tadpole shrimp control in aquatic rice production, use is limited to one application per field during any 24-month period. Application rates are limited to levels which do not increase baseline soil test values for copper over a
timeframe agreed upon by the producer and accredited certifying agent.

For use as an algicide in aquatic rice systems and for tadpole shrimp control in aquatic rice systems; use is not to exceed one application per field during any 24-month period. Application rates are limited to those which do not increase baseline soil test values for copper over a timeframe agreed upon by the producer and accredited certifying agent.


**Crop Residues**  
Nonsynthetic
May not be used in a manner that contaminates crop, water or soil with pesticide residues, heavy metals or pathogens.

Reference: 7 CFR 205.203(c)(3)

**Cytokinins**  
Nonsynthetic
See Growth Regulators.

**Dairy Products**  
Nonsynthetic
Includes, but is not limited to, dairy cultures, milk, cheese, cream, yogurt, casein, and whey.

Reference: 7 CFR 205.105

**Diatomaceous Earth**  
Nonsynthetic
Mined sources, including calcined forms.

Reference: 7 CFR 205.203(d)(2)

**Dolomite**  
Nonsynthetic
See Mined Minerals.

**Dormant Oils**  
Synthetic
See Oils, Horticultural.

**Eggshell Meal**  
Nonsynthetic
Reference: 7 CFR 205.203(c)(3)

**Elemental Sulfur**  
Synthetic or Nonsynthetic
See Sulfur.

**Enzymes**  
Nonsynthetic
May be produced by microbial processes or by extraction from plants or other organisms. Must not be from genetically modified organisms.

Reference: 7 CFR 205.105

**Corn Gluten**  
Nonsynthetic
Reference: 7 CFR 205.203(c)(3)

**Corn Steep Liquor and Solids**  
Nonsynthetic
Also called “condensed fermented corn solubles.”
See also, Food Processing By-Products.
Reference: 7 CFR 205.203(c)(3); NOP Notice 11-3

**Cotton Gin Trash**  
Nonsynthetic
May not be used in a manner that contaminates crop, water, or soil with pesticide residues.
Reference: 7 CFR 205.203(c)(3)

**Cottonseed Meal**  
Nonsynthetic
May not be used in a manner that contaminates crop, water, or soil with pesticide residues.
Reference: 7 CFR 205.203(c)(3)

**Crab Meal**  
Nonsynthetic
See Shellfish Meal.
<table>
<thead>
<tr>
<th>Material</th>
<th>Type</th>
<th>Notes</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epsom Salts</td>
<td>Nonsynthetic or Synthetic</td>
<td>See Magnesium Sulfate.</td>
<td></td>
</tr>
<tr>
<td>Ethanol</td>
<td>Synthetic</td>
<td>Also called “ethyl alcohol.” Permitted as algicide, disinfectants, and sanitizer, including irrigation system cleaning systems. For nonsynthetic ethanol, see Alcohol.</td>
<td>7 CFR 205.601(a)(1)</td>
</tr>
<tr>
<td>Ethylene Gas</td>
<td>Synthetic</td>
<td>Permitted only for regulation of pineapple flowering. See 7 CFR 205.605(b) for allowed postharvest uses.</td>
<td>7 CFR 205.601(k)</td>
</tr>
<tr>
<td>Fatty Acids</td>
<td>Nonsynthetic</td>
<td>Fatty acids produced from plant or animal oils that have been hydrolyzed through heat, pressure, steam, or enzymes only.</td>
<td>7 CFR 205.105</td>
</tr>
<tr>
<td>Feather Meal</td>
<td>Nonsynthetic</td>
<td>Reference: 7 CFR 205.105 &amp; 205.203(c)</td>
<td></td>
</tr>
<tr>
<td>Feldspar</td>
<td>Nonsynthetic</td>
<td>See Mined Minerals.</td>
<td></td>
</tr>
<tr>
<td>Fermentation Products</td>
<td>Nonsynthetic</td>
<td>Products made by the biological activity of bacteria, fungi, or other microorganisms.</td>
<td>7 CFR 205.105</td>
</tr>
<tr>
<td>Ferric Phosphate</td>
<td>Synthetic</td>
<td>Permitted only as slug or snail bait. Also called “Iron Phosphate” or “Iron (III) Phosphate.”</td>
<td>7 CFR 205.601(h)</td>
</tr>
<tr>
<td>Fish Meal and Powder</td>
<td>Nonsynthetic</td>
<td>May not contain synthetic stabilizers or preservatives unless provided for at § 205.601(j).</td>
<td>7 CFR 205.105 &amp; 205.203(c)</td>
</tr>
<tr>
<td>Fish Products, Liquid</td>
<td>Synthetic</td>
<td>Permitted as plant or soil amendments. May be pH adjusted with sulfuric, citric, or phosphoric acid. The amount of acid used shall not exceed the minimum needed to lower the pH to 3.5.</td>
<td>7 CFR 205.601(j)(7)</td>
</tr>
<tr>
<td>Food Processing By-Products</td>
<td>Nonsynthetic</td>
<td>Includes food waste, cannery waste, and pomaces. Plant and animal materials chemically altered by a manufacturing process are not permitted unless resulting material is provided for under § 205.601.</td>
<td>7 CFR 205.203(c)(3) &amp; 205.203(d)(5)</td>
</tr>
<tr>
<td>Fuller's Earth</td>
<td>Nonsynthetic</td>
<td>See Clay.</td>
<td></td>
</tr>
<tr>
<td>Fulvic Acids</td>
<td>Nonsynthetic</td>
<td>Fulvic acids are the fractions of humates soluble at neutral to acid pH. May be extracted from allowed humates with water or nonsynthetic acids. See also Humates.</td>
<td>7 CFR 205.203(d)(2)</td>
</tr>
</tbody>
</table>
Fungal Preparations  Nonsynthetic
See Microbial Products.

Garlic and Garlic Oil  Nonsynthetic
Reference: 7 CFR 205.105

Gibberellic Acid  Nonsynthetic
Also called “Gibberellin A3.” Acceptable if made from a fermentation process. See also, Growth Regulators.
Reference: 7 CFR 205.105

Gluconic Acid  Nonsynthetic
Produced by fermentation by Aspergillus niger. See also, Chelating Agents.
Reference: 7 CFR 205.105

Granite Dust  Nonsynthetic
May not be mixed with petroleum products.
Reference: 7 CFR 205.203(d)(2)

Green Manure  Nonsynthetic
See Plants.

Greensand  Nonsynthetic
See Mined Minerals.

Growth Regulators  Nonsynthetic
Natural growth regulators include, but are not limited to, gibberellic acid, indole acetic acid (IAA) and cytokinins. Synthetic growth regulators are prohibited unless specifically included on the National List for this purpose.
Reference: 7 CFR 205.105 & 205.601(k)

Guano  Nonsynthetic
Includes bat guano and seabird guano. Domesticated fowl excrement is considered manure, not guano. Includes decomposed and dried deposits from wild bats or wild birds. Subject to raw manure restrictions at § 205.203 unless composted or heat processed. Guano must not be directly treated with pesticides.
Reference: 7 CFR 205.203(c)(1) & NOP 5006

Gums  Nonsynthetic
Natural gums are allowed. Includes, but is not limited to, arabic gum; carob bean gum; guar gum; and locust bean gum.
Reference: 7 CFR 205.105

Gypsum  Nonsynthetic
Only mined forms are acceptable. May not be sourced from recycled drywall. Also called “Calcium Sulfate.”
Reference: 7 CFR 205.203(d)

Homeopathic Preparations  Nonsynthetic
Natural materials are allowed, unless included at § 205.602. Any synthetic materials used must be included at section 205.601 of the National List and used in compliance with any annotations provided.
Reference: 7 CFR 205.105

Hoof and Horn Meal  Nonsynthetic
Reference: 7 CFR 205.105

Horticultural Oils  Synthetic
See Oils, Horticultural.

Humates  Nonsynthetic
Acceptable if derived from leonardite, lignite, or coal. See also, Mined Minerals.
Reference: 7 CFR 205.203(d)(2)
Humic Acids

May be derived from leonardite, lignite, coal. Naturally occurring deposits, water and alkali extracts only.

Reference: 7 CFR 205.203(d)(2) & 205.601(j)(3); NOP Policy Memo 13-2

Inoculants

Synthetic growth media not provided for on the National List at § 205.601 must not be present in the final product. See Microbial Products.

Reference: 7 CFR 205.105

Insect Extracts

Ground insects diluted with water (e.g., bug juice).

Reference: 7 CFR 205.206(b)(3)

Iron

Permitted as a plant or soil amendment. Not to be used as a defoliant, herbicide, or dessicant. Soil deficiency must be documented by testing.

Allowed forms include iron sulfates (FeSO₄ or Fe₂(SO₄)₃), iron oxides (FeO, Fe₂O₃, or Fe₂O₃), iron carbonate (FeCO₃), and iron silicate. Those made from nitrates or chlorides are not allowed.

Reference: 7 CFR 205.601(j)(6)

Isopropanol

Also called “rubbing alcohol” or “isopropyl alcohol.” Permitted as an algicide, disinfectant, and sanitizer, including irrigation system cleaning systems.

Reference: 7 CFR 205.601(a)(1)

Kainit

See Mined Minerals.

Kaolin Clay

See Clay.
Kelp and Kelp Meal  
**Nonsynthetic**
See also, [Aquatic Plant Products](#).
*Reference: 7 CFR 205.203(c)(3)*

Kieserite  
**Nonsynthetic**
A mineral found in marine evaporites, MgSO₄·H₂O. See also [Magnesium Sulfate](#) and [Mined Minerals](#).
*Reference: 7 CFR 205.203(d)(2)*

Lactic Acid  
**Nonsynthetic**
Produced through fermentation by *Lactobacillus* spp.
*Reference: 7 CFR 205.105*

Lactose  
**Nonsynthetic**
Precipitated from whey protein using ethanol. If synthetic ethanol is used, it must be removed from the final product.
*Reference: 7 CFR 205.105*

Langbeinite  
See [Mined Minerals](#).

Leaf Mold  
**Nonsynthetic**
*Reference: 7 CFR 205.105*

Lecithin  
**Nonsynthetic**
See also, [Agricultural Substances](#).
*Reference: 7 CFR 205.105*

Leonardite  
See [Humates](#).

Lignin Sulfonate  
**Synthetic**
Also called “lignosulfonate.” Includes ammonium lignosulfonate, calcium lignosulfonate, magnesium lignosulfonate, and sodium lignosulfonate.

Permitted as a chelating agent, dust suppressant, and as a floating agent in postharvest handling.
*Reference: 7 CFR 205.601(j) & 205.601(l)*

Lignite  
See [Humates](#).

Lime Sulfur  
**Synthetic**
Allowed as an insecticide (including acaricide or mite control) and for plant disease control. Includes calcium polysulfide.
*Reference: 7 CFR 205.601(e) & 205.601(i)*

Limestone  
See [Calcium Carbonate](#).

Limonene  
**Nonsynthetic**
Also called “D-limonene.”
*Reference: 7 CFR 205.105*

Magnesium Carbonate  
See [Mined Minerals](#).

Magnesium Chloride  
See [Mined Minerals](#).

Magnesium Rock  
**Nonsynthetic**
*Reference: 7 CFR 205.203(d)(2)*

Magnesium Sulfate  
**Synthetic**
Includes hydrated forms. Allowed with a documented soil deficiency.
See also, [Kieserite](#).
*Reference: 7 CFR 205.601(j)*
Magnetite
See Mined Minerals.

Maltodextrin
See Dextrose.

Manganese  Synthetic
Permitted as a plant or soil amendment. Soil deficiency must be documented by testing. Not to be used as a defoliant, herbicide, or desiccant.

Allowed forms include manganese sulfate (MnSO₄), manganese oxide (MnO), manganese carbonate (MnCO₃), and manganese silicate. Those made from nitrates or chlorides are not allowed.

Reference: 7 CFR 205.601(j)

Manure  Nonsynthetic
Manure includes feces, urine, other excrement, and bedding produced by livestock that has not been composted (§ 205.2). Manure does not include fish feces or insect frass.

Manure from organic or conventional livestock is allowed for organic crop production under the conditions described below.

Raw Manure
Raw animal manure must be composted unless it is: (i) applied to land used for a crop not intended for human consumption; (ii) incorporated into the soil not less than 120 days prior to the harvest of a product whose edible portion has direct contact with the soil surface or soil particles; or (iii) incorporated into the soil not less than 90 days prior to the harvest of a product whose edible portion does not have direct contact with the soil surface or soil particles.

Composted Manure
Composted manure may be used as a supplement to a soil building program without a specific interval between application and harvest. See Compost.

Processed Manure / Heat Processed Manure
Processed manure may be used as a supplement to a soil building program without a specific interval between application and harvest.

Processed manure must be treated so that all portions of the product, without causing combustion, reach a minimum temperature of either 150° F (66° C) for at least one hour or 165° F (74° C), and are dried to a maximum moisture level of 12%; or an equivalent heating and drying process could be used.

Processed manure products must not contain more than 1x10³ (1,000) MPN fecal coliform per gram of processed manure sampled and must not contain more than 3 MPN Salmonella per 4 grams of processed manure sampled.

Reference: 7 CFR 205.2, 205.203(c) & NOP 5006

Manure Tea  Nonsynthetic
Animal manure tea may only be (i) applied to land used for a crop not intended for human consumption; (ii) incorporated into the soil not less than 120 days prior to the harvest of a product whose edible portion has direct contact with the soil surface or soil particles; or (iii) incorporated into the soil not less than 90 days prior to the harvest of a product whose edible portion does not have direct contact with the soil surface or soil particles.

See also, Manure.
Reference: 7 CFR 205.203(c) & NOP 5006
Marl
See Mined Minerals.

Meat By-Products and Waste
Nonsynthetic
Must not be treated with prohibited materials such as synthetic colorings or solvents. See also, Tankage.
Reference: 7 CFR 205.105

Mica
See Mined Minerals.

Microbial Biopesticides
Nonsynthetic
Must not contain synthetic growth media unless provided for on the National List at § 205.601.
Reference: 7 CFR 205.206(d)(2)

Microbial Products
Nonsynthetic
Microorganisms produced using genetic engineering are prohibited.
Reference: 7 CFR 205.105

Micronutrients
Synthetic
See Boron, Cobalt, Copper Products, Iron, Manganese, Molybdenum, Selenium, or Zinc.

Milk
Nonsynthetic
Reference: 7 CFR 205.105

Mined Minerals
Nonsynthetic
Minerals are permitted if not processed or formulated with prohibited materials, such as synthetic dust suppressants, anti-caking agents, or pelleting agents.

Manufacturing process should be reviewed since some substances can be produced using chemical synthesis or are industry by-products.

To be considered nonsynthetic, minerals must not have been heated (calcined) in a way that produces a chemical change in the material.

Mined Minerals of Low Solubility
Includes, but is not limited to, basalt, chalk, clays, gypsum, langbeneite, leonardite, limestone, marl, mica, perlite, sand, stone meal, sulfate of potash, vermiculite, and zeolite.

Mined Minerals of High Solubility
Includes calcium chloride and potassium chloride. Mined minerals of high solubility must be used in compliance with the conditions established at § 205.602.
Reference: 7 CFR 205.203(d)(2) & 205.203(d)(3)

Molasses
Nonsynthetic
Both organic and nonorganic molasses are permitted. Nonorganic molasses may not contain synthetic scale inhibitors, aggregation and precipitation agents, or additives to control fluidity that are not provided for at § 205.601.
Reference: 7 CFR 205.105

Molybdenum
Synthetic
Permitted as a plant or soil amendment. Soil deficiency must be documented by testing. Not to be used as a defoliant, herbicide, or desiccant.

Allowed forms include molybdic oxide (MoO₃) and sodium molybdate (Na₂MoO₄). Those made from nitrates or chlorides are not allowed.
Reference: 7 CFR 205.601(j)

Montmorillonite Clay
See Clay.
### Mulch

**Nonsynthetic or Synthetic**

Mulch includes any nonsynthetic material, such as wood chips, leaves, or straw, or any synthetic material included on the National List for such use, such as newspaper or plastic that serves to suppress weed growth, moderate soil temperature, or conserve soil moisture.

#### Natural Mulch
Includes leaves, straw, crop residues, and other fully biodegradeable materials.

#### Newspaper and Recycled Paper
Newspaper or other recycled paper, without glossy or colored inks, is permitted as mulch.

#### Plastic Mulch
Petroleum-based plastic mulch, other than polyvinyl chloride (PVC), is permitted. The allowance does not include biodegradable plastic. Plastic mulch must be removed from the field at the end of the growing or harvest season. For crops grown as annuals, removal must occur annually. For perennial crops, plastic mulch must be removed before the plastic decomposes or breaks down to prevent removal.

#### Biodegradable Biobased Mulch Film
Biodegradable biobased mulch film is defined as a synthetic mulch film that meets the following criteria:

1. Meets the compostability standards of ASTM D6400 or D6868, or of other equivalent international standards, i.e., EN 13432, EN 14995, or ISO 17088;
2. Demonstrates at least 90% biodegradation absolute or relative to microcrystalline cellulose in less than two years, in soil, according to ISO 17556 or ASTM D5988 testing methods, or meets other applicable ASTM specification for aerobically biodegradable plastics in soil environment; and
3. Must be biobased with content determined using ASTM D6866 testing method.

Biodegradable biobased mulch film must be produced without organisms or feedstock derived from excluded methods.

- 7 CFR 205.2, 205.203(c), 205.206(c), & 205.601(b); NOP Policy Memo 15-1

### Muriate of Potash

See Potassium Chloride.

### Mushroom Compost and Spent Mushroom Substrate
**Nonsynthetic**

Must be derived from allowed materials. Materials that contain manure are subject to restrictions at § 205.203(c)(1) for raw animal manure unless they are composted before or after mushroom production according to § 205.203(c)(2) or NOP 5021. See also, Compost.

Reference: 7 CFR 205.105, 205.203(c), and NOP 5021

### Mycorrhizae
**Nonsynthetic**

Reference: 7 CFR 205.105

### Neem and Neem Derivatives
**Nonsynthetic**

Includes neem cake and neem oil. Azadirachtin, an extract of neem, is also permitted.

Reference: 7 CFR 205.105

### Nematodes
**Nonsynthetic**

See Biological Controls.

### Newspaper or Other Recycled Paper
**Synthetic**

Permitted as mulch or as a compost feedstock.

Reference: 7 CFR 205.601(b) & 205.601(c)
<table>
<thead>
<tr>
<th>Category</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oils, Plant and Animal</strong></td>
<td>Nonsynthetic</td>
<td>Includes, but is not limited to, anise oil, bergamont oil, canola oil, castor oil, citronella oil, clove oil, corn oil, cottonseed oil, eugenol, fish oil, garlic oil (allium sativum), geraniol, jasmine oil, jojoba oil, lavandin oil, lemongrass oil, linseed oil, mustard oil, neem oil, oil of geranium, orange oil, peppermint oil, mint oil, sesame oil, soybean oil, and thyme oil. Reference: 7 CFR 205.105 and 205.203(c)(3)</td>
</tr>
<tr>
<td><strong>Oils, Horticultural</strong></td>
<td>Synthetic</td>
<td>Narrow range oils are permitted as insecticides and for plant disease control as dormant, suffocating, and summer oils. Horticultural oils do not include benzene, naphthalene, toluene, and xylene.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Narrow range oils are defined under § 205.2 as petroleum derivatives, predominately of paraffinic and naphthenic fractions with 50 percent boiling point (10 mm Hg) between 415°F and 440°F. Reference: 7 CFR 205.601(e) &amp; 205.601(i)</td>
</tr>
<tr>
<td><strong>Oxytetracycline Calcium Complex</strong></td>
<td>Synthetic</td>
<td>See Tetracycline.</td>
</tr>
<tr>
<td><strong>Oystershell Lime</strong></td>
<td>Nonsynthetic</td>
<td>Ground shells from oysters. Calcined oyster shell (calcium oxide, quick lime, calcium hydroxide) is considered synthetic and is not permitted as a fertilizer or soil amendment. Reference: 7 CFR 205.105; 7 USC §6508</td>
</tr>
<tr>
<td><strong>Ozone Gas</strong></td>
<td>Synthetic</td>
<td>Permitted as an irrigation system cleaner only. Reference: 7 CFR 205.601(a)</td>
</tr>
<tr>
<td><strong>Paper</strong></td>
<td>Synthetic</td>
<td>See Newspaper or Other Recycled Papers.</td>
</tr>
<tr>
<td><strong>Peanut Meal</strong></td>
<td>Nonsynthetic</td>
<td>Reference: 7 CFR 205.203(c)(3)</td>
</tr>
<tr>
<td><strong>Peat Moss</strong></td>
<td>Nonsynthetic</td>
<td>Must not contain synthetic wetting agents. Reference: 7 CFR 205.105</td>
</tr>
<tr>
<td><strong>Peracetic Acid</strong></td>
<td>Synthetic</td>
<td>For use in disinfecting equipment, seed, and asexually propagated planting material. Also permitted to control fire blight bacteria. Reference: 7 CFR 205.601(a) &amp; 205.601(i)</td>
</tr>
<tr>
<td><strong>Perlite</strong></td>
<td>Nonsynthetic</td>
<td>See Mined Minerals.</td>
</tr>
<tr>
<td><strong>Petroleum Distillates</strong></td>
<td>Synthetic</td>
<td>See Oils, Horticultural.</td>
</tr>
<tr>
<td><strong>Pheromones</strong></td>
<td>Synthetic</td>
<td>As insect management. Reference: 7 CFR 205.601(f)</td>
</tr>
<tr>
<td><strong>Phosphate Rock</strong></td>
<td>Nonsynthetic</td>
<td>Must not be fortified or processed with synthetic chemicals. Includes colloidal phosphate rock. See also, Mined Minerals. Reference: 7 CFR 205.203(d)(2)</td>
</tr>
<tr>
<td><strong>Pine Resins</strong></td>
<td>Nonsynthetic</td>
<td>Reference: 7 CFR 205.105</td>
</tr>
</tbody>
</table>
### Plant Extracts  **Nonsynthetic**

Nonsynthetic plant extracts are allowed.

*Reference: 7 CFR 205.105*

### Plant Protectants  **Nonsynthetic**

Includes, but is not limited to, natural materials that protect plants from harsh environmental conditions such as frost and sunburn, or from infection, or the build-up of dirt on leaf surfaces, or injury by a pest. Allowed nonsynthetic plant protection materials include, but are not limited to, diatomaceous earth, kaolin clay, pine oil, pine resin, and yucca.

*Reference: 7 CFR 205.105*

### Plants  **Nonsynthetic**

Includes aquatic or terrestrial plants or parts of plants such as cover crops, green manures, crop wastes, hay, leaves, and straw. Parts of plants used as soil amendments and foliar feeds are permitted.

*Reference: 7 CFR 205.203(c)(3)*

### Pomace  **Nonsynthetic**

Includes skins, pulp, seeds, and stems of grapes, olives, tomatoes, apples, or other fruit.

*Reference: 7 CFR 205.203(c)(3)*

### Potassium Bicarbonate  **Synthetic**

Allowed for plant disease control only.

*Reference: 7 CFR 205.601(i)*

### Potassium Chloride  **Nonsynthetic**

From mined sources only. Must be applied in a manner that minimizes chloride accumulation in the soil.

*Reference: 7 CFR 205.602(e)*

### Potassium Silicate, Aqueous  **Synthetic**

Allowed as an insecticide and for plant disease control. The silica used in the manufacture of potassium silicate must be sourced from naturally occurring sand.

*Reference: 7 CFR 205.601(e) & 205.601(i)*

### Potassium Sulfate  **Nonsynthetic**

Only if from langbeinite or evaporated from natural brine. See also, [Mined Minerals](#).

Synthetic sources of potassium sulfate are prohibited.

*Reference: 7 CFR 205.203(d)(2)*

### Potting Soil  **Nonsynthetic or Synthetic**

Must be composed entirely of allowed nonsynthetic materials or synthetic materials from § 205.601 permitted as plant and soil amendments. Must not contain synthetic wetting agents.

*Reference: 7 CFR 205.105 & 205.601*

### Predators and Parasites  **Nonsynthetic**

Augmentation or introduction of predators or parasites of a pest species is permitted. See also, [Biological Controls](#).

*Reference: 7 CFR 205.206(b)(1)*

### Propolis  **Nonsynthetic**

Resinous mixture produced by honeybees.

*Reference: 7 CFR 205.105*

### Pseudomonas sp.  **Nonsynthetic**

Includes *P. putida*, *P. fluorescence*, *P. syringae*, and *P. aeruginosa*. See also, [Microbial Biopesticides](#).

*Reference: 7 CFR 205.105*
**Pumice**  
Nonsynthetic  
Volcanic rock. See also, [Mined Minerals](#).

*Reference: 7 CFR 205.203(d)(2)*

**Saponins**  
Nonsynthetic  
See [Plant Extracts](#).

**Pyrethrum**  
Nonsynthetic  
Pyrethrum is an allowed natural botanical extract; pyrethroids are synthetic and prohibited. Synthetic solvents used for extraction of pyrethrum must not be present in the final product. Piperonyl butoxide may not be used as a synergist.

*Reference: 7 CFR 205.105*

**Sawdust**  
Nonsynthetic  
From untreated and unpainted wood only. See also, [Plants](#).

*Reference: 7 CFR 205.203(c)(3)*

**Quassia amara**  
Nonsynthetic  

*Reference: 7 CFR 205.105, 205.206(e)*

**Sea Salt**  
Nonsynthetic  

*Reference: 7 CFR 205.105 & 205.203(d)(3)*

**Rhizobium spp.**  
Nonsynthetic  
Includes symbiotic bacteria that form nodules on the roots of legumes and fix nitrogen. See [Inoculants](#).

*Reference: 7 CFR 205.105*

**Seaweed and Seaweed Products**  
Nonsynthetic or Synthetic  
See [Aquatic Plant Products](#).

**Seed Preparations**  
Nonsynthetic  
Nonsynthetic materials are allowed for use on seeds before planting, including, but not limited to, microbial products, kelp, yucca, gypsum, plant extracts and various clays.

*Reference: 7 CFR 205.105*

**Selenium**  
Synthetic  
Permitted as a plant or soil amendment. Soil deficiency must be documented by testing. Not to be used as a defoliant, herbicide, or desiccant.

Allowed forms include sulfates, carbonates, oxides, or silicates of selenium. Those made from nitrates or chlorides are not allowed.

*Reference: 7 CFR 205.601(j)(6)*

**Shellfish Meal**  
Nonsynthetic  
May not contain prohibited stabilizers or preservatives.

*Reference: 7 CFR 205.105*
Soap

Synthetic

The following soaps are permitted:

Soap-based algicide/demossers, as an algicide, disinfectant, and sanitizer, including irrigation system cleaning systems.

Soap-based herbicides, for use in farmstead maintenance (roadway, ditches, right of ways, building perimeters) and ornamental crops.

Soaps, ammonium. Includes ammonium salts of fatty acids. Only permitted for use as a large animal repellant only, no contact with soil or edible portion of crop.

Insecticidal soaps.

Reference: 7 CFR 205.601(a), 205.601(b), 205.601(d), and 205.601(e)

Soda

Nonsynthetic

Sodium carbonate. Unprocessed mined sources are allowed. See also, Mined Minerals.

Reference: 7 CFR 205.203(d)(2)

Sodium Bicarbonate

Nonsynthetic

See Mined Minerals.

Sodium Carbonate Peroxyhydrate

Synthetic

Permitted as algicide, disinfectants, and sanitizer, including irrigation system cleaning systems.

Federal law restricts the use of this substance in food crop production to approved food uses identified on the product label.

Reference: 7 CFR 205.601(a)

Sodium Chloride

Nonsynthetic

Table salt. Mined sources and evaporation from natural brines only. Must not contain synthetic anti-caking agents not provided for at § 205.601.

Reference: 7 CFR 205.105

Sodium Hypochlorite

Synthetic

See Chlorine Materials.

Sodium Silicate

Synthetic

Permitted as a floating agent in postharvest handling of tree fruit and fiber processing.

Reference: 7 CFR 205.601(l)

Sorghum

Nonsynthetic

See Plants.

Soybean Meal

Nonsynthetic

Reference: 7 CFR 205.203(c)(3)

Sphagnum Moss

Nonsynthetic

Must not contain synthetic wetting agents.

Reference: 7 CFR 205.105

Spinosad

Nonsynthetic

Derived from Saccharopolyspora spinosa. See also, Microbial Biopesticides.

Reference: 7 CFR 205.105

Sticky Traps and Barriers

Synthetic

Permitted for insect control.

Reference: 7 CFR 205.601(e)

Stone Meal

Nonsynthetic

See Mined Minerals.
### Straw

Nonsynthetic

Reference: 7 CFR 205.203(c)(3)

### Sucrose Octanoate Esters

Synthetic


Permitted as an insecticide. Must be used in accordance with approved labeling.

Reference: 7 CFR 205.601(e)

### Sugar

Nonsynthetic

Reference: 7 CFR 205.203(c)(3)

### Sulfate of Potash Magnesia

Nonsynthetic

From mined sources only. See also, Mined Minerals.

Reference: 7 CFR 205.203(d)(2)

### Sulfur

Synthetic or Nonsynthetic

Synthetic elemental sulfur is permitted as an insecticide, for plant disease control, and as a plant or soil amendment.

Nonsynthetic sulfur is allowed without restriction for use.

Reference: 7 CFR 205.601(e), 205.601(i), & 205.601(j)

### Sulfurous Acid

Synthetic

Sulfurous acid (CAS # 7782–99–2) for on-farm generation of substance utilizing 99% purity elemental sulfur § 205.601(j)(2).

Reference: 7 CFR 205.601(j)

### Tankage

Nonsynthetic

The rendered, dried, and ground by-products that are largely meat and bone from animals that are slaughtered or that have died otherwise. See Meat By-Products and Waste.

Reference: 7 CFR 205.105

### Trace Minerals

Nonsynthetic or Synthetic

See Mined Minerals or a specific micronutrient: Boron, Cobalt, Copper Products, Iron, Manganese, Molybdenum, Selenium, or Zinc.

### Trichoderma Species

Nonsynthetic


Reference: 7 CFR 205.105

### Vegetable Protein Hydrolysate

Nonsynthetic

Vegetable matter, including soy, that has been hydrolyzed through heat, pressure, steam, or enzymes is allowed. Acid hydrolyzed vegetable protein is prohibited.

Reference: 7 CFR 205.105

### Vermicompost

Nonsynthetic

Vermicompost that meets the following criteria may be used without restriction: 1) Made only from allowed feedstocks, 2) Aerobic conditions are maintained by regular additions of layers of organic matter, turning, or employing forced air pipes such that moisture is maintained at 70-90%, and 3) The duration of vermicomposting is sufficient to produce a finished product that does not contribute to contamination of crops, soil, or water by plant nutrients, pathogenic organisms, heavy metals, or residues of prohibited substances.

Reference: 7 CFR 205.203(c) & NOP 5021
See Mined Minerals.

Vinaše Nonsynthetic
Nonsynthetic vinaše is permitted. Vinaše is classified as nonsynthetic if it does not contain prohibited additives, such as pH adjustors, sanitizers, ammonium compounds, antibiotics or chlorine materials and is not fortified with nitrogen.


Vinegar Nonsynthetic
Produced through the fermentation of ethanol by acetic acid bacteria. See also, Acetic Acid.

Reference: 7 CFR 205.105

Viruses Nonsynthetic
See Biological Controls.

Vitamins B₁, C, E Synthetic
Permitted as plant or soil amendments.
Vitamin C is also called "Ascorbic Acid."

Reference: 7 CFR 205.601(j)

Vitamin D₃ Synthetic
Also called “Cholecalciferol.” Permitted as a rodenticide.

Reference: 7 CFR 205.601(g)

Water and Wastewater Nonsynthetic
Water and wastewater is permitted, provided that it is used in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, pathogenic organisms, heavy metals, or residues of prohibited substances.

Reference: 7 CFR 205.105

Wetting Agents Nonsynthetic
Nonsynthetic wetting agents, including saponins and microbial wetting agents, are allowed.

Reference: 7 CFR 205.105

Wheat Middlings Nonsynthetic
See Plants.

Whey Protein Nonsynthetic

Reference: 7 CFR 205.105

Wood Ash Nonsynthetic
Wood ash must be produced from untreated and unpainted wood. Wood stove ashes must not be generated from burning of colored paper, plastic, or other prohibited materials. See also, Ash.

Reference: 7 CFR 205.203(d)(4)

Wood Chips and Shavings Nonsynthetic
From untreated and unpainted wood only.

Reference: 7 CFR 205.203(c)(3)

Wool Nonsynthetic

Reference: 7 CFR 205.105

Worms and Worm Castings Nonsynthetic
See Vermicompost.

Yeast Nonsynthetic
Yeast must not be produced using excluded methods. Includes Saccharomyces cerevisiae, yeast extract autolysate, and yeast hydrolysate. See also, Microbial Products.

Reference: 7 CFR 205.105

Yucca Nonsynthetic
See Plant Extracts.
Zeolite  
See Mined Minerals.

Zinc  
Permitted as a plant or soil amendment. Soil deficiency must be documented by testing. Not to be used as a defoliant, herbicide, or dessicant.

Allowed forms include zinc sulfate (ZnSO₄), zinc oxide (ZnO), zinc carbonate (ZnCO₃), and zinc silicate. Those made from nitrates or chlorides are not allowed.

Reference: 7 CFR 205.601(j)(6)
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