



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.

Acetic Acid *Nonsynthetic*

Made by oxidative or anaerobic fermentation. Solutions that contain less than 8% acetic acid are vinegar. See also, [Vinegar](#).

Reference: 7 CFR 205.105

Alcohol *Nonsynthetic*

Ethanol made by fermentation is permitted without restriction. For synthetic alcohol, see [Ethanol](#) or [Isopropanol](#).

Reference: 7 CFR 205.105

Agar *Nonsynthetic*

Also called “agar-agar.” See also, [Aquatic Plant Products](#).

Reference: 7 CFR 205.105

Alfalfa Meal or Pellets *Nonsynthetic*

Pelletization process must not involve prohibited materials.

Reference: 7 CFR 205.203(c)(3)

Agricultural Substances *Nonsynthetic*

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

Algae *Nonsynthetic*

See [Aquatic Plant Products](#).

Almond Hull Trash *Nonsynthetic*

See [Plants](#).

Aloe Extract *Nonsynthetic*

See [Plant Extracts](#).



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 14-1

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 documented by testing. Allowed soluble boron products include boric acid, hydrated forms of sodium tetraborate, sodium borate derivatives, disodium octaborate, and its hydrated forms, and hydrated forms of colemanite. Boron products made from nitrates or chlorides are not allowed.

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

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](#)



Calcium Carbonate *Nonsynthetic*

Also called “limestone.” Naturally mined forms are allowed. May not be sourced from by-product of food or paper processing.

Reference: 7 CFR 205.203(d)(2)

Calcium Chloride *Nonsynthetic*

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.

Reference: 7 CFR 205.602(c)

Calcium Hydroxide *Synthetic*

See [Hydrated Lime](#).

Calcium Hypochlorite *Synthetic*

See [Chlorine Materials](#).

Calcium Lignosulfonate *Synthetic*

See [Lignin Sulfonate](#).

Calcium Polysulfide *Synthetic*

See [Lime Sulfur](#).

Calcium Sulfate *Nonsynthetic*

See [Gypsum](#).

Cannery Wastes and Cannery Waste Water *Nonsynthetic*

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.

Reference: 7 CFR 205.203(d)(5)

Capsaicin *Nonsynthetic*

See [Plant Extracts](#).

Cardboard *Synthetic*

See [Newspapers or Other Recycled Papers](#).

Carnauba Wax *Nonsynthetic*

See [Plants](#).

Castor Oil *Nonsynthetic*

See [Oils, Plant and Animal](#)

Chalk *Nonsynthetic*

See [Mined Minerals](#).

Chelating Agents *Nonsynthetic or Synthetic*

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.

Reference: 7 CFR 205.105 & 205.601(j)(4)

Must be from a natural source, such as sea animals or fungi.

Reference: 7 CFR 205.105

Chlorine Dioxide *Synthetic*

See [Chlorine Materials](#).



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.

Reference: 7 CFR 205.601(a)(2) & NOP 5026; NOP Policy Memo 15-4.

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)

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 cobalt oxide (CoO), cobalt sulfate (CoSO₄), cobalt carbonate (CoCO₃), and cobalt silicates. Cobalt materials made from nitrates or chlorides are not allowed.

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:

Compost that contains no animal materials as feedstock may be used without restriction provided that it contains no prohibited or restricted-use plant materials. Must be made from allowed compost feedstocks.

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 time frame agreed upon by the producer and accredited certifying agent.

Reference: 7 CFR 205.601(a)(3), 205.601(e)(4), & 205.601(i)

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](#).

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 205.105

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



Epsom Salts *Nonsynthetic or Synthetic*

See [Magnesium Sulfate](#).

Ethanol *Synthetic*

Also called “ethyl alcohol.” Permitted as algicide, disinfectants, and sanitizer, including irrigation system cleaning systems.

For nonsynthetic ethanol, see [Alcohol](#).

Reference: 7 CFR 205.601(a)(1)

Ethylene Gas *Synthetic*

Permitted only for regulation of pineapple flowering. See 7 CFR 205.605(b) for allowed postharvest uses.

Reference: 7 CFR 205.601(k)

Fatty Acids *Nonsynthetic*

Fatty acids produced from plant or animal oils that have been hydrolyzed through heat, pressure, steam, or enzymes only.

Reference: 7 CFR 205.105

Feather Meal *Nonsynthetic*

Reference: 7 CFR 205.105 & 205.203(c)

Feldspar *Nonsynthetic*

See [Mined Minerals](#).

Fermentation Products *Nonsynthetic*

Products made by the biological activity of bacteria, fungi, or other microorganisms.

Reference: 7 CFR 205.105

Ferric and Ferrous Compounds *Synthetic*

For micronutrient use, see [Iron](#).

Ferric Phosphate *Synthetic*

Permitted only as slug or snail bait. Also called “Iron Phosphate” or “Iron (III) Phosphate.”

Reference: 7 CFR 205.601(h)

Fish Meal and Powder *Nonsynthetic*

May not contain synthetic stabilizers or preservatives unless provided for at § 205.601(j).

Reference: 7 CFR 205.105 & 205.203(c)

Fish Products, Liquid *Synthetic*

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.

Reference: 7 CFR 205.601(j)(7)

Food Processing By-Products *Nonsynthetic*

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.

Reference: 7 CFR 205.203(c)(3) & 205.203(d)(5)

Fuller’s Earth *Nonsynthetic*

See [Clay](#).

Fulvic Acids *Nonsynthetic*

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](#).

Reference: 7 CFR 205.203(d)(2)



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 *Synthetic or Nonsynthetic*

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

Hydrated Lime *Synthetic*

Permitted for plant disease control only. Not permitted as a fertilizer or soil amendment.

Reference: 7 CFR 205.601(i)

Hydrogen Chloride *Synthetic*

Gaseous form of hydrochloric acid. Permitted for delinting cotton seed for planting only.

Reference: 7 CFR 205.601(n)

Hydrogen Peroxide *Synthetic*

Also called “hydrogen dioxide.” Permitted as an algicide, disinfectants, and sanitizer, including irrigation system cleaning systems. Also permitted for plant disease control.

Reference: 7 CFR 205.601(a)(4) & 205.601(e)

Inert Ingredients *Synthetic*

Includes substances categorized as EPA List 4—Inerts of Minimal Concern on EPA list dated August 2004. For passive pheromone dispensers, substances classified as List 3 – Inerts of Unknown Toxicity on EPA list dated August 2004 are also permitted.

Allowed inert ingredients are only permitted in pesticide formulations and may not be used in other types of products.

Reference: 7 CFR 205.601(m) and NOP 5008

Inoculants *Nonsynthetic*

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 *Nonsynthetic*

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

Reference: 7 CFR 205.206(b)(3)

Iron *Synthetic*

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 (FeSO_4 or $\text{Fe}_2(\text{SO}_4)_3$), iron oxides (FeO , Fe_2O_3 , or Fe_3O_4), iron carbonate (FeCO_3), and iron silicate. Those made from nitrates or chlorides are not allowed.

Reference: 7 CFR 205.601(j)(6)

Iron Phosphate *Synthetic*

See [Ferric Phosphate](#).

Isopropanol *Synthetic*

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, $MgSO_4 \cdot H_2O$. 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 ($MnSO_4$), manganese oxide (MnO), manganese carbonate ($MnCO_3$), 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 1×10^3 (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

Mined 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 dessicant.

Allowed forms include molybdc oxide (MoO_3) and sodium molybdate (Na_2MoO_4). 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

Includes newspaper and other recycled paper such as cardboard, without glossy or colored inks. Does not include paper that is not recycled (i.e., virgin paper).

Permitted as mulch or as a compost feedstock.

Reference: 7 CFR 205.601(b) & 205.601(c)



Oils, Plant and Animal *Nonsynthetic*

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)

Oils, Horticultural *Synthetic*

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.

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) & 205.601(i)

Oxytetracycline Calcium Complex *Synthetic*

See [Tetracycline](#).

Oystershell Lime *Nonsynthetic*

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

Ozone Gas *Synthetic*

Permitted as an irrigation system cleaner only.

Reference: 7 CFR 205.601(a)

Paper *Synthetic*

See [Newspaper or Other Recycled Papers](#).

Peanut Meal *Nonsynthetic*

Reference: 7 CFR 205.203(c)(3)

Peat Moss *Nonsynthetic*

Must not contain synthetic wetting agents.

Reference: 7 CFR 205.105

Peracetic Acid *Synthetic*

For use in disinfecting equipment, seed, and asexually propagated planting material.

Also permitted to control fire blight bacteria.

Reference: 7 CFR 205.601(a) & 205.601(i)

Perlite *Nonsynthetic*

See [Mined Minerals](#).

Petroleum Distillates *Synthetic*

See [Oils, Horticultural](#).

Pheromones *Synthetic*

As insect management.

Reference: 7 CFR 205.601(f)

Phosphate Rock *Nonsynthetic*

Must not be fortified or processed with synthetic chemicals. Includes colloidal phosphate rock.

See also, [Mined Minerals](#).

Reference: 7 CFR 205.203(d)(2)

Pine Resins *Nonsynthetic*

Reference: 7 CFR 205.105



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)

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

Quassia amara *Nonsynthetic*

Reference: 7 CFR 205.105, 205.206(e)

Rhizobium spp. *Nonsynthetic*

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

Reference: 7 CFR 205.105

Rice Hulls *Nonsynthetic*

See [Plants](#).

Rotenone *Nonsynthetic*

The EPA has not registered for sale any rotenone products in the United States.

Reference: 7 CFR 205.105, 205.206(e)

Ryania *Nonsynthetic*

Reference: 7 CFR 205.105, 205.206(e)

Sabadilla *Nonsynthetic*

Reference: 7 CFR 205.105, 205.206(e)

Sand *Nonsynthetic*

See [Mined Minerals](#).

Saponins *Nonsynthetic*

See [Plant Extracts](#).

Sawdust *Nonsynthetic*

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

Reference: 7 CFR 205.203(c)(3)

Sea Salt *Nonsynthetic*

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

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 repellent 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*

Sucrose octanoate esters (CAS #s—42922–74–7; 58064–47–4).

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)

Talc *Nonsynthetic*

See [Mined Minerals](#).

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*

Includes *T. asperellum*, *T. atroviride*, *T. fasciculatum*, *T. gamsii*, *T. hamatum*, *T. harzianum*, *T. koningii*, *T. reesie*, *T. virens*, and *T. viride*. See also, [Microbial Biopesticides](#).

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](#).

Vinasse *Nonsynthetic*

Nonsynthetic vinasse is permitted. Vinasse 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.

Reference: 7 CFR 205.105; NOSB Formal Recommendation, May 2, 2014.

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 cerevisia*, yeast extract autolysate, and yeast hydrolysate. See also, [Microbial Products](#).

Reference: 7 CFR 205.105

Yucca *Nonsynthetic*

See [Plant Extracts](#).



Zeolite

Nonsynthetic

See [Mined Minerals](#).

Zinc

Synthetic

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 ($ZnSO_4$), zinc oxide (ZnO), zinc carbonate ($ZnCO_3$), and zinc silicate. Those made from nitrates or chlorides are not allowed.

Reference: 7 CFR 205.601(j)(6)



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