

Compost & Soil Amendments

Version 1.0 September 2021

Reason for Standard

Soil amendments, such as compost and fertilizers, are important tools for home gardeners and commercial farmers alike. They enhance soil health, improve plant growth, and increase microorganisms in the soil. The primary purpose of any regulations that exist for these products is to ensure food safety when using animal manure on crops—the Food and Drug Administration (FDA) has set minimal standards for compost manure aimed at reducing pathogens.ⁱ

However, commercial soil amendments are not well regulated to protect against contamination from pesticides, Genetically Modified Organisms (GMOs), heavy metals, and other chemicals.ⁱⁱ For example, many commercial composts are derived from “biosolids,” which is treated sewage sludge rich in organic matter and basic elemental nutrients like nitrogen, phosphorus, and sulfur.ⁱⁱⁱ The use of sewage sludge as a soil amendment is highly concerning because it can be contaminated with heavy metals, pesticides, PFAS, pathogens, pharmaceuticals, and other toxins.^{iv}

Another key issue with soil amendments is that the use of synthetic fertilizer can be a major source of pollution, even for home gardens. Synthetic fertilizers release reactive nutrients into the environment at a much higher rate than is possible with natural biological process, causing high concentrations of nutrients to accumulate and pollute surrounding water systems. Nitrogen- and phosphorus-rich runoff from agricultural lands is a major driver of eutrophication, a process that creates “dead zones” in aquatic ecosystems.^v There is also growing awareness around using materials of ecological concern as additives and enhancements in soil amendments, such as peat moss and perlite.^{vi}

Ideally, the solution would be to use compost and soil amendments that are certified organic. However, use of the term “organic” creates some confusion for home gardeners when deciding what product to purchase. The U.S. Department of Agriculture’s (USDA) National Organic Program (NOP) does not regulate the use of the term “organic” for commercial fertilizer and soil amendments. On these products, a label declaring “organic” means only that the product is carbon-based.^{vii} “100 percent natural” means only that it is not synthetic. Some “organic” and “100 percent natural” fertilizers contain pesticides that may damage crops and undisclosed hazardous chemicals from industrial waste, mining, or other contaminated sources. In fact, the NOP allows manure from non-organic cows, along with conventional yard and crop waste that may contain synthetic pesticide residues to become compost approved for organic food production. The NOP has released guidance for allowed and prohibited inputs and processes regarding application of soil amendments to certified organic farms.^{viii}

To address some of these concerns, state agencies and some organizations certify soil amendment products to a higher standard than the NOP. The Organic Material Review Institute (OMRI), for example, will certify products as approved for use in organic food production. Using these certifications as a baseline, PCC’s compost and soil amendment standard aims to address many of the contamination concerns noted above and ensure the safest products are on our shelves, which meet the expectations of members and shoppers.

Scope

This standard applies to any products intended for use as plant-growing mediums and aids, such as compost, potting soil, fertilizer, and any nutrient blends for soil enrichment.

Standard

1. Products

- 1.1. All compost and soil amendments sold at PCC must be approved and registered for use in certified organic food production by one of the following:
 - 1.1.1. [Washington State Department of Agriculture](#) (WSDA)
 - 1.1.2. [Organic Materials Review Institute](#) (OMRI)
 - 1.1.3. [California Department of Food and Agriculture](#) (CDFA)

2. Sourcing of Ecologically Sensitive Materials

- 2.1. Compost and soil amendments should be evaluated to ensure that harvesting or use of ecologically sensitive materials does not cause undue harm to native ecosystems and minimizes negative climate change impacts.
- 2.2. Where inclusion of ecologically sensitive material offers competing benefits and negative impacts, PCC should seek to provide multiple offerings.

Standard-Specific Glossary

Animal byproducts include cooking oil from restaurants and food processors, blood and blood products, pork and horse protein, feather meal, manure, and hatchery waste.

Biosolids, also known as sewage sludge, are nutrient-rich organic materials resulting from the sanitation and processing of domestic sewage in a treatment facility. Biosolids are rich in organic matter and elemental nutrients like nitrogen, phosphorus, sulfur, potassium, calcium, and magnesium. They are applied to agricultural land after treatment to enhance the soil and aid in plant growth. However, there is significant concern around the safety of biosolids because they can be contaminated with hazardous materials, including heavy metals, pesticides, PFAS, pathogens, pharmaceuticals, and other toxins.

Compost, as defined by the US Composting Council, is the product manufactured through the controlled aerobic, biological decomposition of biodegradable materials. Compost is used to enhance soil health by restoring nutrients, adding organic matter, and improving microbial biodiversity.

Ecologically sensitive materials are natural resources that may have significant negative environmental impacts associated with their extraction, harvest, or processing. Removal and use may put stress on native ecosystems, contribute to greenhouse gas emissions, or reduce carbon sequestration potential for essential areas. Added to compost and soil, examples include, but are not limited to, peat moss, perlite, and coconut coir.

Eutrophication is the process by which a body of water becomes overly enriched with nutrients, primarily nitrogen and phosphorous, leading to excessive algae and plant growth and oxygen deficiency. When the algae and plants eventually start decomposing, they release large quantities of carbon dioxide, which lowers the pH of the water, making it more acidic (a process known as acidification).

Fertilizers are chemical substances added to the soil or land to increase fertility and provide essential nutrients for plant growth. Most commercial fertilizers typically contain nitrogen, phosphorus, and potassium, which are three of the most essential chemical nutrients to plant growth and health. The

chemicals found in fertilizer products can be synthetically produced or derived from natural sources. Natural sources include substances like bonemeal, cottonseed meal, seaweed, fish emulsions, which breakdown in the soil and release the nutrients they contain.

Heavy metals are naturally occurring elements found in the earth's crust and are characterized chemically by a high atomic weight and a density at least five times greater than that of water. Heavy metals are widely used in various industrial, agricultural, and domestic applications, such as the production of clothing dyes, pesticides, electronics, batteries, and more. This extraction, processing, use, and disposal has released large quantities of heavy metals in more reactive forms into the environment. Once released from the ground, they are persistent pollutants that can accumulate food, water, air, and dust. Arsenic, lead, chromium, cadmium, and mercury are of particular concern because they are highly toxic to humans.

National Organic Program (NOP) was established in 2000 under the Organic Foods Production Act of 1990 to regulate the production, processing, and sale of certified organic foods in the United States. The NOP resides within the USDA and manages organic certification standards, enforcement, and accreditation of independent certifying bodies. The National Organic Standards Board (NOSB), a federal advisory committee, provides recommendations and guidance to the NOP on developing new rules and regulations related to organic certification.

Organic can have two meanings in the context of soil amendments and compost. It can refer to the practices and acceptable materials associated with organic food production, outlined under the USDA's National Organic Program (NOP). Certain organizations provide certifications for compost products that meet strict standards and are acceptable for organic food production. Generally, however, when the term "organic" is used in the context of soil, it refers to the fact they are carbon-based, or comprised of chemicals that fall under the field of [organic chemistry](#).

Organic Materials Review Board (OMRI) is an independent nonprofit organization that supports organic integrity by developing clear information and guidance about materials, so that producers know which products are appropriate for organic operations. OMRI reviews and approves products such as fertilizers, composts, pest controls, livestock health care products, and other inputs that are intended for use in organic agriculture.

Organic matter refers to carbon-based material—plants and animals—that are living, dead, or decomposing. In this context, the term "organic" is used in the sense that it is comprised of organic chemicals and is not referring to systems that certify agriculture or food products as organic, such as the USDA's National Organic Program.

Pesticides are chemical substances used to kill, repel, or control pests, including insects, rodents, fungi, and unwanted plants, which interfere with cultivation of a crop or food product. The term includes herbicides that target plants, insecticides that target insects, rodenticides that target rodents, and fungicides for controlling mold or mildew growth.

PFAS, or per and polyfluoroalkyl substances, are chemicals used for their water and oil repellency; they are persistent in the environment and do not breakdown into benign substances over time. There are thousands of substances within the PFAS family, the most well-known one goes under the brand name of Teflon, used to coat non-stick cookware. PFAS can be found in food packaging, cookware, textiles and clothing, cosmetics, camping gear, fire retardants, and more. There is strong evidence that exposure to PFAS reduces immune system function, causes birth defects, damages internal organs, and increases the risk of certain cancers, such as prostate and bladder cancer.^{ix}

Soil amendments are organic and inorganic materials applied on and mixed into agricultural soils to change the physical and chemical characteristics of the soil. There are multiple types of soil amendments including fertilizers, compost, and manure.

Synthetic is a term that generally refers to a substance that has been chemically changed, does not exist in nature, or can exist in nature but was produced through chemical reactions. According to the USDA NOP, any substance other than those naturally occurring in a plant, animal or mineral is considered synthetic if it is formulated or manufactured by a chemical process.^x

ⁱ U.S. Food & Drug Administration, “Produce Safety Rule: Biological Soil Amendments of Animal Origin,” FDA Fact Sheet, accessed February 5, 2021, <https://www.fda.gov/media/114775/download>.

ⁱⁱ Josh Harkinson, “Are There Toxins in Your Compost?,” *Mother Jones* (blog), June 6, 2021, www.motherjones.com/environment/2011/06/are-there-toxins-your-compost/.

ⁱⁱⁱ Dan M. Sullivan, Craig G. Cogger, and Andy I. Bary, “Fertilizing with Biosolids” (Pacific Northwest Extension, February 2015), https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/pnw508_0.pdf.

^{iv} Joel Preston Smith, “EPA Whistleblower: Agency Faked Data on Safety of ‘Biosolids,’” *Sound Consumer (PCC Community Markets)*, August 2014, www.pccmarkets.com/sound-consumer/2014-08/epa-whistleblower-agency-faked-data-on-safety-of-biosolids/.

See also, Agnieszka Rorat et al., “Sanitary and Environmental Aspects of Sewage Sludge Management,” *Industrial and Municipal Sludge*, 2019, 155–80, <https://doi.org/10.1016/B978-0-12-815907-1.00008-8>.

^v Joe Wertz, “The Contaminants We Can’t Live Without,” *Grist* (blog), January 22, 2020, <https://grist.org/food/fertilizer-is-a-major-pollutant-why-doesnt-the-government-regulate-it-as-one/>.

^{vi} Adrian Higgins, “Is This Popular Gardening Material Bad for the Planet?,” *Washington Post*, May 11, 2017, sec. Home & Garden, www.washingtonpost.com/lifestyle/home/should-sustainable-gardeners-use-peat-moss/2017/05/09/1fc746f0-3118-11e7-9534-00e4656c22aa_story.html.

^{vii} Richard O.C. Norman, Carl R. Noller, and Melvyn C. Usselman, “Organic Compound” (Encyclopaedia Britannica, February 23, 2023), <https://www.britannica.com/science/organic-compound>.

^{viii} Thea Rittenhouse, “Tip Sheet: Compost” (National Center for Appropriate Technology, July 2015), www.ams.usda.gov/sites/default/files/media/Compost_FINAL.pdf.

^{ix} Agency for Toxic Substances and Disease Registry, “Potential Health Effects of PFAS Chemicals,” ATSDR, June 24, 2020, <https://www.atsdr.cdc.gov/pfas/health-effects/index.html>.

^x National Organic Standards Board, “NOSB Guidance for the Review of Synthetic and Non-Synthetic Substances” (USDA National Organic Program, August 17, 2005), www.ams.usda.gov/sites/default/files/media/NOP%20Rec%20Guidance%20Review%20of%20Synthetic%20and%20Nonsynthetic%20substances.pdf.