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September 30, 2025

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National Organic Standards Board
USDA-AMS-NOP
1400 Independence Ave. SW.,
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Docket ID # AMS-NOP-25-0034

Re. CS: Synthetic compostable feedstocks

These comments to the National Organic Standards Board (NOSB) on its Fall 2025 agenda are submitted on behalf of Beyond Pesticides. Founded in 1981 as a national, grassroots, membership organization that represents community-based organizations and a range of people seeking to bridge the interests of consumers, farmers, and farmworkers, Beyond Pesticides advances improved protections from pesticides and alternative pest management strategies that eliminate a reliance on pesticides. Our membership and network span the 50 states and the world.

Summary of these comments and language change needed

Beyond Pesticides, with one small exception, supports the proposal of the Crops Subcommittee (CS). That exception is in the name of the material—it should be called "synthetic compostable materials" to avoid confusion with the many natural materials that are compostable. Synthetics that do not meet the requirements of the *Organic Foods Production Act* (OFPA), including the requirement to be "necessary to the production or handling of the agricultural product because of the unavailability of wholly natural substitute products" are not permitted to be added to the National List. The Biodegradable Products Institute (BPI) petition should be denied.

Compost from plant and animal materials is of fundamental importance to organic practices. Composting is one way that organic growers meet the requirement in law to "foster soil fertility, primarily through the management of the organic content of the soil through proper tillage, crop rotation, and manuring."[1] The integrity of organic production must be maintained by preserving the integrity of compost. Contaminants in broadly defined "compost feedstocks" cannot be predicted, but history suggests that more persistent toxic pollutants will be found. The NOSB must maintain control over synthetic materials allowed in organic

[1] Organic Food Production Act (OFPA) 6513(b)(1).

production, as required by OFPA. Only synthetic materials that are specifically added to the National List through the prescribed process should be allowed in compost destined to be an input into organic production. Research continues to raise alarms about the hazards associated with the use of plastic, including the microplastic particles that are distributed in alarming amounts throughout the environment and taken up by organisms, including humans. The NOSB should reopen the workplan item on contaminated inputs that is currently on hold.

The CS has done an excellent job of addressing the issue of listing synthetic compostable materials that meet ASTM (American Society for Testing and Materials) standards D6400, D6868 and D8410 as a class on the National List. For the record, we reiterate our support in the following sections.

Overview

Compost from plant and animal materials is of fundamental importance to organic practices. While we want to encourage composting in general, it is increasingly viewed as a dumping ground for the waste products of industrial society. Because of the potentially broad nature of the inputs, compost without parameters is incompatible with the principles of organic production. It is important to recognize that composting of "food waste" can result in widespread contamination with persistent toxic chemicals and heavy metals.[2] This can occur not only from the use of the compost in organic production, but also from its widespread use in other systems, encouraged by its acceptance in organic systems. Organic standards must maintain strict control over allowed organic inputs and seek ways to eliminate contaminated inputs.

Compost is of fundamental importance for organic production.

The requirement for organic producers to "foster soil fertility, primarily through the management of the organic content of the soil through proper tillage, crop rotation, and manuring" is a central tenet of OFPA at §6513. Composting is the principal tool used by organic producers in implementing this management requirement. Most importantly, compost introduces and augments the soil organisms that build organic fertility and sequester carbon in the soil.

The NOSB, in advising USDA on implementation of OFPA, approved "Principles of Organic Production and Handling"[3] that emphasize, above all, that organic production systems "optimize soil biological activity." Organic systems also, according to the NOSB, "[r]ecycle materials of plant and animal origin in order to return nutrients to the land, thus minimizing the use of non-renewable resources" and "[m]inimize pollution of soil, water, and air."

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[2] EPA, 2021. Emerging Issues in Food Waste Management: Persistent Chemical Contaminants. https://www.epa.gov/system/files/documents/2021-08/emerging-issues-in-food-waste-management-persistent-chemical-contaminants.pdf. For heavy metals, see Zhujie Chu, Xiuhua Fan, Wenna Wang, Wei-chiao Huang, Quantitative evaluation of heavy metals' pollution hazards and estimation of heavy metals' environmental costs in leachate during food waste composting, 2019. Waste Management 84,: 119-128. https://doi.org/10.1016/j.wasman.2018.11.031.

[3] NOSB recommendation adopted October 17, 2001.

These principles are also built into NOSB guidance on compatibility with a system of sustainable agriculture and consistency with organic farming and handling,[4] to be used in National List decisions. That guidance lists as its first question, "Does the substance promote plant and animal health by enhancing the soil's physical chemical, or biological properties?"

National Organic Program (NOP) regulations also recognize the importance of composting and building soil biology at §205.203: The "[s]oil fertility and crop nutrient management practice standard" that describes practices, including composted plant and animal materials, that "maintain or improve the physical, chemical, and biological condition of soil and minimize soil erosion."

Organic Agriculture and Organic "Waste"

Although organic agriculture "emphasizes the use of management practices in preference to the use of off-farm inputs,"[5] organic farmers and gardeners are known for collecting organic matter from surrounding farms and communities. When organic farmers can make use of manure, grass clippings, vegetable waste, and other organic materials that would otherwise cause problems for others, it appears to be a mutually beneficial arrangement.

However, there are often other parties involved, some of whom may be unknown to both the organic farmer and the supplier of the materials. Manure may come from animals that have been treated with antibiotics, other drugs prohibited in organic production, or pesticides. Grass clippings may be from lawns that were treated with pesticides (including insecticides, herbicides, and fungicides) and synthetic fertilizers. Straw may come from a crop that was treated with pesticides and synthetic fertilizers.

Many of these contaminants can be broken down to harmless constituents by composting and other practices used on organic farms, but some may not. In addition, use patterns can affect residues of pesticides–such as when herbicides are used as harvest aids.

Organic Methods in Environmental Cleanup

Bioremediation is the use of biological agents, such as bacteria, fungi, or green plants, to remove or neutralize contaminants, as in polluted soil or water. In doing so, it uses methods long employed by organic farmers, such as composting and plants that accumulate specific substances.

The process of composting uses organisms, including earthworms, bacteria, and fungi, to break down organic matter to a form more readily available to soil life, which releases nutrients for plants. Since many pesticides and industrial pollutants are organic (carbon-based) chemicals, they may be broken down by the same process. Bioremediation of contaminated sites uses microorganisms and fungi selected or engineered for feeding on specific contaminants.

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[4] NOSB recommendation adopted April 29, 2004.

[5] NOSB Principles of Organic Production and Handling, adopted October 17, 2001.

Organic farmers may also use plants that accumulate certain macro- and micronutrients. If these plants are composted, they make those nutrients more available to crops. Bioremediation may also make use of plants and fungi that hyperaccumulate heavy metals in phytoextraction. In this case, the harvested crop can be moved off the site and contaminants recovered through composting or incineration. This may even become an economically viable source of the metals.[6]

Industrial Byproducts as Organic Inputs

The penchant of organic farmers for scavenging inputs has not gone unnoticed by industry. As a result, the National Organic Program has received petitions to allow several materials that are byproducts of industrial processes. These include ash from burning poultry manure, sulfurous acid, tall oil, corn steep liquor, and vinasse. The NOSB has sometimes—though not always—treated these materials as being incompatible with organic production. In part, the incompatibility arises from a reluctance to be reliant on industrial byproducts. In the case of ash from manure burning–a nonsynthetic material prohibited for use because of the dependence of organic production on the carbon and nitrogen that manure provides—the NOSB has stated, "Utilizing burning as a method to recycle millions of pounds of excess poultry manure inadvertently supports the business of CAFOs by creating an organic industry demand for ash. Utilizing ash from manure burning in order to assist CAFOs in their reduction of environmental and human health contamination is not a compelling argument for consideration for addition to the National List."[7]

Contaminants are more pervasive, with negative impacts in smaller concentrations, than were previously known.

We are daily confronted with examples of two forms of this pervasive contamination—microplastics and poly- and per- fluoroalkyl substances (PFAS).

Plastic

Research continues to raise alarms about the hazards associated with the use of plastic, including the microplastic particles that are distributed in alarming amounts throughout the environment and taken up by organisms, including humans. A study published by researchers at Columbia and Rutgers universities in the January 2024 Proceedings of the National Academy of Sciences reports that the average liter of three brands of bottled water in the U.S. contains almost a quarter of a million bits of microplastics, of which 90 percent are at the nanoscale.[8] The other ten percent are slightly larger, at microscale.

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[6] Raskin, I., Smith, R. D., & Salt, D. E. (1997). Phytoremediation of metals: using plants to remove pollutants from the environment. *Current opinion in biotechnology*, *8*(2), 221-226.

[7] Spring 2015 proposal on petition for annotation of ash from manure burning on §205.602 of the National List.

[8] Qian N, Gao X, Lang X, Deng H, Bratu TM, Chen Q, Stapleton P, Yan B, Min W. Rapid single-particle chemical imaging of nanoplastics by SRS microscopy. Proc Natl Acad Sci U S A.

A study by researchers at Norway's MicroLEACH project analyzes the components of 50 items in common use—plastic bags, disposable cups, dishwashing gloves, car tire granules, children's toys and balloons[9] —and found, as in previous studies, that many hazardous chemicals are in the plastics as well as many that **could not be identified** because they were not listed in the major chemical substance databases. Only 30 percent of the chemical compounds identified in the study were present in two or more products. This suggests that most plastics contain many unidentified chemicals, far beyond the known impurities, metabolites, and degradation products. Further, it suggests that in the environment plastics are chemically reactive and forming new compounds not anticipated and whose toxicity is unknown.

In the Columbia/Rutgers study, the researchers checked for seven types of plastic, but they were only able to identify about ten percent of the nanoparticles they found. Polyethylene terephthalate (PET) was a common ingredient, probably because many water bottles are made of it. However, they also found polyamide, polystyrene, polyvinyl chloride, and polymethyl methacrylate. (Tap water also contains microplastics in many places, although in much lower concentrations.) The team found that the number of individual chemical compounds varied wildly among products, ranging from 114 to 2,456, leading them to conclude that "assessing the toxicity of plastic chemicals present in a product based on testing individual target chemicals has limited value." Norwegian scientists also exposed cod eggs, embryos, and larvae to water containing microplastics. The toxic effects they observed include spinal deformities similar to scoliosis in humans.

Another new study finds that, out of a total of 257 patients who completed the study, polyethylene was detected in carotid artery plaque of 150 patients (58.4%), with a mean level of 2% of plaque; 31 patients (12.1%) also had measurable amounts of polyvinyl chloride, with a mean level of 0.5% of plaque.[10] Yet another study concludes that microplastic particles have even shown up in the brain as well as the placenta.[11]

The scientific literature shows that microplastics and pesticides, both ubiquitous throughout the environment, have synergistic effects that threaten aquatic organisms. This means the combined toxicity of the two substances is greater than the sum of two individual exposures. The most recent study to demonstrate this, published in *Ecotoxicology*,[12] focuses on the impacts of microplastics and chlorpyrifos, a widely used organophosphate insecticide, on cladocerans, a group of microcrustaceans.

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[9] Summary at https://phys.org/news/2023-12-toxicity-standard-plastic-products.html.

[10] Marfella R, Prattichizzo F, Sardu C, Fulgenzi G, Graciotti L, Spadoni T, D'Onofrio N, Scisciola L, La Grotta R, Frigé C, Pellegrini V, Municinò M, Siniscalchi M, Spinetti F, Vigliotti G, Vecchione C, Carrizzo A, Accarino G, Squillante A, Spaziano G, Mirra D, Esposito R, Altieri S, Falco G, Fenti A, Galoppo S, Canzano S, Sasso FC, Matacchione G, Olivieri F, Ferraraccio F, Panarese I, Paolisso P, Barbato E, Lubritto C, Balestrieri ML, Mauro C, Caballero AE, Rajagopalan S, Ceriello A, D'Agostino B, Iovino P, Paolisso G. Microplastics and Nanoplastics in Atheromas and Cardiovascular Events. N Engl J Med. 2024 Mar 7;390(10):900-910. https://www.nejm.org/doi/full/10.1056/NEJMoa2309822.

[11] https://www.nytimes.com/2024/03/09/health/microplastics-sxsw-health-plastic-people.html.

[12] https://link.springer.com/article/10.1007/s10646-025-02909-5.

A literature review of over 90 scientific articles[13] in *Agriculture* documents microplastics' increase in the bioavailability, persistence, and toxicity of pesticides used in agriculture. The interactions between microplastics and pesticides enhance the threat of pesticide exposure to nontarget organisms, perpetuates the cycle of toxic chemical use, and decreases soil health that is vital for productivity.

PFAS

With health risks,[14] including developmental, metabolic, cardiovascular,[15] and reproductive harm, cancer, damage to the liver, kidneys, and respiratory system, as well as the potential to increase the chance of disease infection and severity,[16] per- and polyfluoroalkyl substances (PFAS) and their toxic trail of contamination in the environment is wreaking havoc with all life. Gestational (during pregnancy) and childhood exposure to PFAS increases cardiometabolic risk, or the risk of heart diseases and metabolic disorders, later in life, according to a Brown University study published in *Environment International*.[17] The use of PFAS in industrial and commercial applications has led to widespread contamination of water and biosolids used for fertilizer, poisoning tens of millions of acres of land and posing a significant threat to the biosphere, public health, gardens, parks, and agricultural systems. Farmers and rural communities, in particular, bear the brunt of this contamination, as it affects their drinking water, soil quality, and livestock health.

There are more than 9,000 synthetic (human-made) chemical compounds in the PFAS family, which includes the most well-known subcategories, PFOS (perfluorooctane sulfonate) and PFOA (perfluorooctanoic acid). These PFAS compounds have been dubbed "forever chemicals" for their persistence in the environment (largely because they comprise chains of bonded fluorine–carbon atoms, those bonds being among the strongest ever created). PFAS contamination of drinking water, surface and groundwater, waterways, soils, and the food supply, among other sources, is a ubiquitous and concerning contaminant across the globe.

The widespread exposure to these compounds arises from multiple sources, both past and present. PFAS is used as an active ingredient in as many as 1,000 products, which can contaminate compost. Although some of the uses have been or are being phased out, many persist, including several related to food processing and packaging.[18] The flooding of the

[13] https://www.mdpi.com/2077-0472/15/4/356.
[14] https://www.atsdr.cdc.gov/ToxProfiles/tp200-c2.pdf.
[15] https://beyondpesticides.org/dailynewsblog/2021/04/exposure-to-pfas-the-forever-chemical-during-pregnancy-results-an-increase-in-heart-and-metabolic-problems-among-adolescence/.
[16] https://www.theguardian.com/environment/2022/mar/10/pfas-covid-infection-forever-chemicals-studies.
[17] Nan Li, Yun Liu, George D. Papandonatos, Antonia M. Calafat, Charles B. Eaton, Karl T. Kelsey, Kim M. Cecil, Heidi J. Kalkwarf, Kimberly Yolton, Bruce P. Lanphear, Aimin Chen, Joseph M. Braun, Gestational and childhood exposure to per- and polyfluoroalkyl substances and cardiometabolic risk at age 12 years, Environment International, Volume 147, 2021, 106344, ISSN 0160-4120, https://doi.org/10.1016/j.envint.2020.106344.
[18] https://www.fda.gov/food/process-contaminants-food/authorized-uses-pfas-food-contact-applications#:~:text=Paper%2Fpaperboard%20food%20packaging%3A%20PFAS,from%20leaking%20through%20the%20packaging.

materials stream with thousands of persistent synthetic PFAS compounds since their first uses in the 1950s allows them to remain widespread in the environment and in human bodies.

PFAS compounds have been found to contaminate water, irrigation sources, and soils themselves—often through the use of fertilizers made from so-called “biosludge” or “biosolids” from local waste treatment plants. Thankfully, the drafters of OFPA provisions had the foresight to prohibit the use of sewage sludge, or biosolids. Sewage plants may discharge millions of gallons of wastewater into waterways, contaminating them; current waste and water treatment generally does not eliminate PFAS compounds from treated effluent. Biosolids and wastewater have long been sources of exposure concerns related to pesticides, industrial chemicals, pharmaceuticals, personal care products, and household chemicals; PFAS contamination is now rising as a specific and concerning addition to that list.

These forever (and perhaps “everywhere”) compounds may be contaminating nearly 20 million acres of productive agricultural land in the U.S. A significant portion of farmers, perhaps 5%, is using biosludge from local treatment plants as fertilizer on their acreage.[19] The use of biosludge was thought by many, a decade ago, to be a sensible use of the waste products from treatment; it was even encouraged by many state agricultural department programs, but now it is recognized that these products present threats when spread on fields that produce food—or anywhere that presents the possibility of human, organism, or environmental exposures to potentially toxic PFAS compounds. Notably, there are currently no federal requirements to test such sludge “fertilizers” for the presence of PFAS.[20]

Meanwhile, we must not lose sight of the fact that PFAS chemicals are not the only legacy contaminants. Others include wood preservatives, DDT, dioxins, and the termiticide chlordane. Unfortunately, some of these continue to be added to the environment, sometimes inadvertently, but also intentionally, particularly through pesticide use.

Furthermore, PFAS and microplastics—both contaminants little known a few years ago—act synergistically to threaten fish and wildlife, as well as humans.[21]

Need for a contaminated inputs strategy

What is avoidable contamination? As has been pointed out by the CS, “It is widely acknowledged that some level of pesticides, heavy metals, PFAS, glass, plastic, etc. enters the composting process.”

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[19] https://www.ewg.org/news-insights/news/2022/04/ewg-forever-chemicals-may-taint-nearly-20-million-cropland-acres.

[20] https://www.epa.gov/biosolids/regulatory-determinations-pollutants-biosolids and https://www.epa.gov/cwa-methods/frequent-questions-about-pfas-methods-npdes-permits.

[21] https://www.bayjournal.com/opinion/forum/how-pfas-microplastics-join-forces-as-a-synergistic-threat/article_634b24b6-d25e-11ee-adc1-d7d52920fb27.html.

Beginning with a discussion document in Fall 2014, the NOSB began to grapple with the problem of contamination of inputs that have been traditionally used in organic production.[22] OFPA addresses residues in agricultural products. §6506(a)(6) of OFPA requires certifying agents to test for "any pesticide or other nonorganic residue or natural toxicants." §6511 requires that, "If the Secretary, the applicable governing State official, or the certifying agent determines that an agricultural product sold or labeled as organically produced under this chapter contains any detectable pesticide or other nonorganic residue or prohibited natural substance, the Secretary, the applicable governing State official, or the certifying agent shall conduct an investigation to determine if the organic certification program has been violated, and may require the producer or handler of such product to prove that any prohibited substance was not applied to such product." It also provides for the removal of organic certification if the substance is found to be intentionally added or present at excessive levels. §6518(k) makes it a responsibility of the NOSB to "advise the Secretary concerning the testing of organically produced agricultural products for residues caused by unavoidable residual environmental contamination."

§205.203(c) of NOP regulations requires that, "The producer must manage plant and animal materials to maintain or improve soil organic matter content 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." §205.671 states, "When residue testing detects prohibited substances at levels that are greater than 5 percent of the Environmental Protection Agency's tolerance for the specific residue detected or unavoidable residual environmental contamination, the agricultural product must not be sold, labeled, or represented as organically produced." Other sections of the regulations relate to the testing for residues.

In the 2014 discussion document, the NOSB cited these examples of topics that have become issues in the last few years:
• Heavy metal contamination of manure, compost, mined minerals and fish products;
• Neonicotinoid residues that could harm pollinators when taken up by plants;
• Insecticide residues such as bifenthrin that can be detected in compost
• Excessive foreign materials in compost and green waste;
• Antibiotic residues in manures that can affect soil organisms and result in tetracycline-resistant bacteria; and
• Genetically engineered plant material that may or may not break down in compost and soil.

Since then, the use of "produced water" from oil production and wastewater from hydraulic fracturing extraction of oil and gas ("fracking") for irrigation has arisen as another issue. PFAS contamination is recognized as serious. And now we have a petition from BPI to greatly expand the universe of materials allowed to be composted for use in organic production.

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[22] Unfortunately, this workplan item is currently on hold. https://www.ams.usda.gov/sites/default/files/media/NOSBWorkAgenda.pdf.

In the spring 2015 NOSB meeting, the Crops Subcommittee reported that it is continuing to address the contamination issue by looking at pathways by which contaminants reach organic farms and the extent to which the contamination can be mitigated by composting and other practices.

BPI petition

On August 30, 2023, BPI submitted a petition for rulemaking to USDA, asking NOP to update the compost regulations. Specifically, BPI advocated adding a definition for "compost feedstocks" to the organic regulations and replacing the references to "plant and animal materials" with "compost feedstocks"—to be defined to include materials meeting ASTM International's compostability standards.

By submitting this to USDA as a petition for rulemaking, BPI attempts to circumvent the NOSB, whose responsibility it is to determine which synthetic substances may be used in organic production. BPI should have instead petitioned for inclusion on the National List those specific synthetics that may be contained in "compost feedstocks." We are glad to see that the CS has treated the BPI petition as a petition to add specific substances to the National List.

Currently, the USDA organic regulations allow only newspaper and other recycled paper, through their inclusion on the National List, in addition to composting of plant and animal materials.

The devastation caused by biosolids should be a lesson about unknown risks.

The use of biosolids (sewage sludge) has never been allowed in organic production. However, in 2022, 56% of biosolids were applied to land—31% to agricultural land—and nonorganic producers who thought it was a good deal[23] are now learning otherwise. Farmers are being ordered to shut down their operations because their land and products are contaminated with poly- and perfluoroalkyl substances (PFAS).[24] It is also affecting organic farmers who bought contaminated land unknowingly.[25] The lesson from biosolids is not that certain contaminants are hazardous, but that we cannot predict the hazards coming from uncontrolled sources.

Conclusion

Beyond Pesticides supports the substance of the proposal of the CS. However, the material should be called "synthetic compostable materials" to avoid confusion with the many natural materials that are compostable. The integrity of organic production must be maintained by preserving the integrity of compost. The NOSB must maintain control over synthetic materials allowed in organic production, as required by OFPA. Only synthetic materials that are specifically added to the National List through the prescribed process should be allowed in

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[23] https://kentuckylantern.com/2024/03/07/legislature-should-reject-sludge-regulations-that-could-harm-farmers-damage-farmland/.

[24] https://www.kcur.org/news/2024-03-11/pfas-contaminated-biosolids-state-testing.

[25] https://www.thenewlede.org/2024/03/farmers-facing-pfas-pollution-struggle-for-solutions/ .

compost destined to be an input into organic production. Contaminants in broadly defined "compost feedstocks" cannot be predicted, but history suggests that more persistent toxic pollutants will be found. The petition from BPI should be denied. The NOSB should reopen the workplan item on contaminated inputs that is currently on hold.

Thank you for your consideration of these comments.

Sincerely,

Terry Shistar, Ph.D.
Board of Directors