

Formal Recommendation
From: The National Organic Standards Board (NOSB)
To: The National Organic Program (NOP)

Date: October 24, 2024

Subject: Compost Definition and Practice standard update

NOSB Chair: Kyla Smith

The NOSB hereby recommends to the NOP the following:

Rulemaking Action: X

Statement of the Recommendation:

The NOSB recommends several changes to the definition and organic regulations for compost:

Amendment to 205.2 Terms Defined:

Compost – the product of managed aerobic, biological decomposition of plant and/or animal materials, ~~and/or~~ {which may include} permitted synthetic compost feedstocks in § 205.601(c). The product will have undergone mesophilic and thermophilic temperatures, which significantly reduce the viability of pathogens and weed seeds, and stabilize the carbon such that it is beneficial to plant growth.

Motion to amend § 205.203(c) Soil fertility and crop nutrient management practice standard:

(2) Composted plant and animal materials ~~and/or~~ {which may include} permitted synthetic compost feedstocks in § 205.601(c) produced through a process that:

- (i) Maintains aerobic conditions at a minimum temperature at or above 131 F for 3 days using a contained/in-vessel process or a mechanically forced/aerated static pile process; or
- (ii) Maintains aerobic conditions in a windrow process at or above 131 F for 15 days (which do not have to be consecutive), during which period, the materials must be turned a minimum of 5 times.

Update to the Definition under 205.2 terms defined:

The proposed inclusion of the term "aerobic" aligns with consistent regulatory terminology, as it is crucial in defining the composting process. In 2015, the FDA, under the Food Safety Modernization Act (FSMA), introduced the final Produce Safety Rule, which defines composting as requiring aerobic conditions. Additionally, public comments from the compost industry in Spring 2024 and Fall of 2024 recommended that organic regulations align with language from the American Association of Plant and Food Control Officials (AAPFCO). Their proposed definition of compost is:

Compost is the product manufactured through the controlled aerobic, biological decomposition of biodegradable materials. The product undergoes mesophilic and thermophilic temperatures, significantly reducing the viability of pathogens and weed seeds, and stabilizing the carbon in a way that benefits plant growth.

The inclusion of this updated definition aligns organic regulations with AAPFCO, FDA, EPA, and FSMA regulations, harmonizing the composting framework across various regulatory bodies. It also reflects current scientific research and industry practices. The proposed change to the compost definition thus represents a balanced approach, ensuring the regulatory framework reflects contemporary composting practices.

*note: Harmonization of regulations external to organic and the impacts to state decision making on compost industry infrastructure is an important goal of the Petition submitted to the USDA by BPI, the NOSB sees the update to the definition as professionally important to answering concerns raised by the BPI petition.

Update to the Composting Requirements in 205.203:

- **C:N Ratios:** Public comments and input from the compost industry were supportive of removing the carbon-to-nitrogen ratio requirement. While C:N ratios are considered best practice in the industry, they are not practical or necessary as a regulatory requirement. Testing compost feedstocks for accurate C:N ratios can be prohibitively expensive and does not reliably indicate the C:N of finished compost, which is more functional to end users. Regulations from agencies external to the USDA do not require demonstration of initial C:N ratios.
- **Time and Temperature Requirements:** The proposed changes streamline the time and temperature requirements, reflecting public comments and industry feedback. This simplification ensures that organic standards align with FDA, EPA, and FSMA regulations while still protecting the integrity of organic composting. The time and temperature requirements are intended to demonstrate pathogen reduction; the proposed changes provide clarity and consistency.

Rationale Supporting Recommendation

Addressing the BPI Petition and Related Issues:

The NOSB's motion to amend the compost definition and requirements also responds to concerns raised in the BPI petition. BPI requested that compostable plastics, specifically those meeting ASTM compostability specifications, be included as permissible feedstocks for composting. Additionally, they proposed amending 205.203(e) to allow de minimis traces of synthetic materials in fertilizers and compost. The NOSB has an established path for allowing synthetic substances to enter organic systems, which is through the National List and the NOSB process of evaluating inputs against National List criteria. The Crops Subcommittee has created a path by which BPI's concerns can be addressed through long established procedures that incorporate processes indicated by OFPA and the subsequent development of regulations through the NOP/NOSB/public process. The full board and public comments from organic stakeholders have indicated support for the continuation of this process to modernize compost practice standards. The NOSB has incorporated the totality of the compost issue into consideration and has accepted this recommendation for updates on the definition and the practice standard as the first step in re-framing issues surrounding compost as a foundational organic input to the soil. The CS and the full Board have not found a productive process path to evaluate a "de minimis" approach for allowing synthetic inputs into organic systems. Organic regulations do not contain a definition for a "de minimis". The CS is concerned that BPI's suggested approach could disrupt organic practice of evaluating substances and may have broad ranging implications for organic integrity and transparency in many areas of organic systems. Public comments from organic farmers and compost makers reinforced that our regulations and definitions are performing well, noting that minimal updates are needed. The CS and the full Board have indicated the will to equitably evaluate BPI's petition for the allowance of synthetic substances as compost feedstock by addressing the overarching issues in this proposal and requesting Technical Reviews of compostable packaging materials towards making determinations for prohibition or allowance of such materials on the National List. This proposal

represents a distinct and complete area of progress for the definition and the practice standard. Future work by the Board will address the potential for including new synthetic substances on the National List.

BPI's Petition claims that compost is the product of a naturally occurring biological process and therefore, by organic definitions, should be classified as nonsynthetic and categorically allowed in organic crop production. The Petition claims that the NOSB's position and any other National List determinations of this nature are not defensible under OFPA. The following demonstrates the NOSB's "decision tree" rationale for making determinations for substances which are classified as synthetic, enter a naturally occurring biological process but are NOT classified as natural by organic systems:

Step-by-Step Analysis

1. Initial Determination: Is the substance synthetic or non-synthetic?
 - If a substance is formulated or manufactured through a chemical process or altered through a process that chemically changes a naturally occurring substance, it is classified as synthetic under the Organic Act.
 - If the substance is derived from plant, animal, or mineral matter and does not undergo chemical alteration, it is classified as non-synthetic (natural).
2. Once classified as synthetic, can the substance become non-synthetic (natural) via a biological process?
 - According to the definition, synthetic substances are those that have undergone chemical alteration or chemical processes, which are distinct from biological processes.
 - A substance that has already been classified as synthetic cannot retroactively change its classification due to a naturally occurring biological process.

The definition of "synthetic" in the Organic Act hinges on whether the substance was chemically altered. Biological processes (e.g., fermentation, composting) are distinct from chemical processes and thus do not alter the synthetic classification of a substance.

"Decision Tree" Summary:

1. Does the substance undergo chemical alteration?
 - Yes → Synthetic
 - No → Non-Synthetic (Natural)
2. Can a naturally occurring biological process change this classification?
 - No. Once a substance is determined to be synthetic based on a chemical process, a biological process cannot alter that determination

Classification Conclusion:

Once a substance has been classified as synthetic (because it was chemically altered or created through a chemical process), it cannot change its classification to non-synthetic simply because it undergoes a naturally occurring biological process. The definition of "synthetic" is not dependent on biological

processes but rather on chemical processes. Thus, a substance that is synthetic remains synthetic, regardless of subsequent biological transformations.

In response to issues raised in the Work Agenda request from the NOP, the NOSB emphasizes that:

- The current regulatory framework already excludes anaerobic digestate from composting, as per the Fall 2017 NOSB recommendation. Previous work by the NOSB indicated that anaerobic processes include pathogens of concern that vary from those appearing in aerobic composting conditions and should be distinctly evaluated.
- This proposal does not alter guidance for vermicomposting, which also relies on aerobic conditions, thus maintaining consistency with current practices.

This recommendation is designed to update and refine organic compost standards to reflect current scientific research, regulatory alignment, and industry best practices. The proposal ensures that compliant organic composting practices remain effective in maintaining soil fertility, nutrient management, and the overall integrity of the organic system. The proposed amendments to the compost definition and composting requirements represent a crucial step in harmonizing the organic regulatory framework with other federal standards while fulfilling the requirement listed at 205.203 that organic crop inputs “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”. By simplifying and aligning the regulations, the NOSB supports the continued advancement of organic agriculture while ensuring that the health and sustainability of the system remain central to all regulatory changes.

NOSB Vote:

Motion 1:

Motion to amend the language in the original motions to read as follows (see red text below):

Motion 2:

Motion to amend 205.2 Terms Defined:

Compost – The product of managed aerobic, biological decomposition of plant and/or animal materials, **and/or, which may also include** permitted synthetic compost feedstocks at § 205.601(c). The product will have undergone mesophilic and thermophilic temperatures, which significantly reduce the viability of pathogens and weed seeds, and stabilize the carbon such that it is beneficial to plant growth.

Motion by: Mindee Jeffery

Seconded by: Amy Bruch

Yes: 14 No: Abstain: 0 Recuse: 0 Absent: 1

Motion 3:

Motion to amend § 205.203(c) Soil fertility and crop nutrient management practice standard:

(2) Composted plant and animal materials **and/or, which may also include** permitted synthetic compost feedstocks at § 205.601(c) produced through a process that:

- (i) Maintains aerobic conditions at a minimum temperature at or above 131 F for 3 days using a contained/in-vessel process or a mechanically forced/aerated static pile process; or
- (ii) Maintains aerobic conditions in a windrow process at or above 131 F for 15 days (which do not have to be consecutive), during which period, the materials must be turned a minimum of 5 times.

Motion by: Allison Johnson

Seconded by: Nate Lewis

Yes: 14 No: Abstain: 0 Recuse: 0 Absent: 1

Motions passed

National Organic Standards Board
Crops Subcommittee
Compost Proposal
August 13, 2024

Introduction:

Compost and the process by which it is produced are defined in the organic regulations at §205.2 Terms Defined. Additionally, section 205.203(c) of the soil fertility and crop nutrient management practice standard outlines further requirements for processing and applying plant and animal materials under the organic regulations. The section emphasizes that an organic compost 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”. The National List § 205.601 provides for one synthetic exception to plant and animal material composition of organic compost, with a listing for newspaper as a compost feedstock.

Certain types of compost and manure-based inputs commonly used in organic farming were not directly addressed in the rule, such that additional information and clarification was needed. Two different task forces were commissioned to make recommendations on compost, vermicompost, processed manures, and compost tea. In April 2002 the Compost Task Force Recommendation was presented to the NOSB and subsequently accepted as a recommendation to the NOP. In October 2004, a separate report and recommendation was presented to the NOSB by the Compost Tea Task Force. That document was also accepted by the NOSB, and the Crops Subcommittee (CS) was directed by the Board to determine the necessary work that needed to be done to clarify these documents to the public. In October 2006, the CS produced a document titled: Crops Subcommittee Recommendation for Guidance Use of Compost, Vermicompost, Processed Manure, and Compost teas, which was accepted by the NOSB. The NOP responded to those recommendations with guidance document [NOP 5021](#) with the stated purpose of clarifying “allowed practices for composition, production, and use of compost and vermicompost in organic crop production”. In December of 2016, the NOP published information regarding alternative compost methods in [NOP 5034-1](#) Materials for Crop Production.

Given the efforts to address climate change through waste reduction and recycling, and to continuously improve and provide clarification of the organic standards, the NOSB and the Crops Subcommittee have been in discussions with the NOP regarding opportunities to update organic definitions and regulations regarding organic compost production. These discussions led to an official work agenda request to the NOP in September of 2023. Concurrently, in August of 2023, the Biodegradable Products Institute (BPI) submitted a petition for rulemaking directly to the United States Department of Agriculture (USDA), requesting that AMS change the definition of compost and add a definition of “compost feedstock” to the federal organic regulations at 205.2. Further, the petition seeks amendments to § 205.203. In October of 2023, the NOP issued a [Memorandum to the National Organic Standards Board](#) requesting a recommendation on the topic of compost in organic agriculture.

In the Spring of 2024, the Crops Subcommittee introduced a [discussion document](#) to provide a forum for the NOSB, NOP, and the stakeholder community to gain insight into the state of organic compost production. NOSB also hosted an expert panel on compost at the Spring 2024 meeting. This proposal responds to the information obtained from stakeholder engagement towards fulfilling the request by the NOSB to update compost references in regulations, while addressing the interest and concerns raised by BPI in a petition to the USDA to update compost definitions in organic regulations.

Background - Addressing concerns raised by the BPI Petition directly to the USDA:

The Crops Subcommittee and the full Board have clearly reinforced the Board's commitment to the organic process as it has worked since inception. The CS is not looking to disrupt long established organic processes by redefining foundational aspects of organic systems. Public comments from the compost industry were clear that the NOP regulations are working, and there is room for improvement, but defining compost feedstocks to include synthetic substances not on the National List or referring to a "de minimis" doctrine that has not been established in our definitions or regulations. Bypassing the NOSB process is a dangerous implementation of new procedures that circumvents our unique version of American democracy. The CS and the full Board have expressed a commitment to the process of evaluating synthetic inputs through the National List, technical reviews and full board engagement with stakeholder expertise via written and public comments. The process is predictable, and facilitates equitable engagement while providing a level of transparency to consumers upon which trust in the organic seal is founded. Moving the goalpost to meet the needs of an adjacent industry undermines the current practice of thorough evaluation of organic inputs via criteria established in regulations. The pressure to innovate climate change solutions to waste related challenges is a "politics of the moment" that appears to look towards the organic industry as a driver for acceptance to innovation in compostable waste. Nevertheless, the process USDA, NOSB, and the organic community has established for review of material inputs into organic systems that works and should not be jettisoned or circumvented.

The organic industry's approach to material review has matured and become more sophisticated in the past three decades following the passage of the Organic Foods Production Act. The NOP established in Guidance (NOP 5033) that natural substances that undergo chemical change resulting from a biological process remain natural. However, this precedent cannot be applied to synthetic substances that are subject to a chemical change that occurs through a biological process. In this case, substances that start as synthetic end as synthetic even if the chemical change was the result of a biological process. This principle applies to a compost feedstock that becomes part of the soil and plant life in organic cropping systems: the composting process, itself a biological process, does not magically transform synthetic substances into natural ones, and, as such, any feedstock used in the composting process should be either a natural or synthetic substance that has been added to the National List through a two-thirds vote by the NOSB and notice and comment rulemaking by NOP.

The petition from BPI asserts that the common practice of material review through the Subcommittee dissection of criteria to meet the National List allowance for allowed and prohibited substances is not necessary for compostable packaging. [The petition](#) states:

“This Petition seeks to have the materials and products that meet the American Society for Testing Materials (“ASTM”) standards for compostability be designated as allowed compost feedstocks. The packaging materials that meet the ASTM compostability standard are presently allowed as food contact substances in packaging for organic food but anomalously are disallowed as a compost feedstock.”

The Crops Subcommittee is clear that the considerations taken into account when evaluating food contact substances in organic handling do not apply when evaluating inputs into organic cropping systems, even if those inputs may be food contact substances themselves. As a synthetic material, if compostable packaging is to be considered as a compost feedstock, the material is required to be evaluated and recommended for listing by a 2/3 vote of the NOSB and added to the National List by NOP through notice, comment, and rulemaking.

Additionally, the petition utilizes ASTM D6400-21, D6868-21, and D8610-21 as a means to objectively identify which synthetic substances should be allowed as compost feedstocks in organic compost. The CS acknowledges the utility of ASTM standards as a means to reliably review substances for adherence to a particular standard, and recognizes that ASTM standards are currently included in the organic regulations for substances on the National List:

7 CFR 205.2

Biodegradable biobased mulch film. A synthetic mulch film that meets the following criteria:

- (1) Meets the compostability specifications of one of the following standards: ASTM D6400, ASTM D6868, EN 13432, EN 14995, or ISO 17088 (all incorporated by reference; see [§ 205.3](#));
- (2) Demonstrates at least 90% biodegradation absolute or relative to microcrystalline cellulose in less than two years, in soil, according to one of the following test methods: ISO 17556 or ASTM D5988 (both incorporated by reference; see [§ 205.3](#)); and
- (3) Must be biobased with content determined using ASTM D6866 (incorporated by reference; see [§ 205.3](#)).

Paper-based crop planting aid. A material that is comprised of at least 60% cellulose-based fiber by weight, including, but not limited to, pots, seed tape, and collars that are placed in or on the soil and later incorporated into the soil, excluding biodegradable mulch film. Up to 40% of the ingredients can be nonsynthetic, other permitted synthetic ingredients in [§ 205.601\(j\)](#), or synthetic strengthening fibers, adhesives, or resins. Contains no less than 80% biobased content as verified by a qualified third-party assessment (e.g., laboratory test using ASTM D6866 or composition review by qualified personnel).

As required by OFPA and National List review criteria, NOSB’s review of synthetic allowances on the National List must include information pertaining to the composition of allowed substances, not simply their fate in the environment. The ASTM standards for compostability do not provide composition assurances beyond indicating whether a substance is a plastic, a polymer liner or additive to paper and other substrates, or a fiber-based packaging material. Because of these limitations, the CS is declining to

include an amendment to the National List as part of this proposal, and instead, decoupled the National List matter of compostable plastics from this recommendation pertaining to definitions and practice standards. ASTM D6400-21, D6868-21, and D8410-21 standards for compostability require no more than 10% of the material to remain after 84 days in a controlled composting test. In public comments, the full Board heard the feedback from the composting industry that conditions are not consistent for this expectation to be met, nor do most commercial composting operations cure composting piles for that length of time. With respect, CS does not see the Petitioner's solutions to the problem of compostable plastics in organic compost as encompassing the evaluative depth of clarity required by organic regulatory processes.

Background - Addressing areas for follow up raised in Spring 2024 Discussion Document but not specifically addressed in this Proposal's Recommendation to the NOP:

In the Spring of 2024, the Crops Subcommittee asked stakeholders a series of questions regarding the current state of the compost industry and how practice/regulations relate to organic language and evaluation for allowance. During full Board discussion, members acknowledged concurrent work being done by the Compliance, Accreditation, and Certifications Subcommittee (CACS) around issues of residue testing and contamination issues facing organic producers. In that discussion, the Board acknowledged that questions around unavoidable residual environmental contamination (UREC), residue testing, and contamination should remain outside the scope of this proposal while CACS works on that particular issue. Public commenters were supportive of changes to the language in the definition and § 205.203, composting methods, time and temperature, C:N ratio, and the evaluation of synthetic compostable substances for inclusion on the National List following the typical process of evaluation by the Board. In this proposal we provide recommendations for changes to the definition and practice standard sections relating to compost. Recognizing that evaluation of synthetic compost feedstocks for inclusion on the National List requires gathering of additional technical information related to the substance's composition, fate in the environment, impacts to human health, and general use patterns, CS will place this body of work into a separate discussion document.

Compostable Polymers

At NOSB's Spring 2024 meeting in Milwaukee, WI, public commenters expressed strong and varied opinions about the appropriateness of including compostable polymers on the National List and allowing them in compost used on organic farms. In general, those wary of including these substances provided comments focused on two major areas of concern: 1. The potential for the compostable polymers, themselves, to contaminate soil and water; and 2. The overuse of single-use plastics, in general, and whether the allowance for compostable plastics in organic production would violate the National List criteria that requires all substances on the National List to be consistent with organic farming. Additionally, those commenters in support of allowing compostable polymers into compost used on organic farms cited these substances' role in meeting waste reduction goals, their uniformity and consistency in degradation during the composting process, and the strength of the organic market to drive innovation and adoption of food waste reduction in order to meet greenhouse gas emission reduction goals.

In light of the significant interest in reviewing suitability of compostable polymers for their inclusion in the National List as compost feedstocks, CS is moving forward with information gathering in order to inform its decision. Additionally, the CS is taking the following steps:

1. Ordering a Technical Review (TR) of resin formulated products and fiber-based products that meet ASTM D6400-21, D6868-21, or D8410-21 standards in order to inform the evaluation of whether these substances' chemical properties align with the tenets of organic production.
2. Hosting a conversation with organic stakeholders about composting as a driver of change towards sustainability, diverting food waste from the landfill and into composting operations, the role compostable polymers and other synthetic compost feedstocks play in meeting these waste reduction goals, and reducing polyethylene plastic and other contamination in compost currently used on organic farms.

CS is in discussion on how to frame a Technical Review on compostables, which we expect will support a more exhaustive review of these types of substances' fate in the environment and impacts on human health. We hope to solicit stakeholder comments to inform our evaluation of compostable polymers against National List criteria and whether the current allowance and annotation for newspaper as a synthetic compost feedstock remains relevant. Please continue to provide comments to the Subcommittee in order to inform ongoing work on the topic.

Subcommittee Review:

The Crops Subcommittee is grateful to the NOP for composing an expansive work agenda item for the NOSB around compost. Compost is foundational to the organic ethos. The partnership of a public engagement process, supported by industry expertise and technical review, towards recommendations that are then evaluated by the NOP for rulemaking is one of the least understood and most powerful forms of democracy in this country. We celebrate the USDA for receiving a petition around regulations and definitions and staying committed to the NOSB process. CS was also challenged upon learning that while a petition and a work agenda request had been introduced to the NOSB from the NOP around the compost definition, the NOP was concurrently working on a federal register notice to update the compost definition. The difficulty of working concurrently on organic issues has been avoided by great collaboration between the NOP and the NOSB in the past. The Subcommittee hopes this level of communication can be re-cultivated in future and is acknowledging the issue in this document due to the difficult nature of proposing new language while the regulations are in flux. For the purposes of this document, CS in this proposal recommends new language for the definition of 'compost' at 7 CFR 205.2 and for the composting requirements outlined at 7 CFR 205.203 with the understanding that the NOP will need to incorporate any recommendations made by NOSB into its rulemaking process already underway in the [Market Development Rule for Mushrooms and Pet Food](#).

7 CFR 205.2 - Definitions

Currently, organic regulations define compost as:

205.2 Terms Defined

Compost. The product of a managed process through which microorganisms break down plant and animal materials into more available forms suitable for application to the soil. Compost must be produced through a process that combines plant and animal materials

- 1. with an initial C:N ratio of between 25:1 and 40:1.*
- 2. Producers using an in-vessel or static aerated pile system must maintain the composting materials at a temperature between 131 °F and 170 °F for 3 days.*
- 3. Producers using a windrow system must maintain the composting materials at a temperature between 131 °F and 170 °F for 15 days, during which time, the materials must be turned a minimum of five times.*

The CS proposes the following new definition for compost:

Compost – the product of managed aerobic, biological decomposition of plant and/or animal materials, and/or permitted synthetic compost feedstocks at § 205.601(c). The product will have undergone mesophilic and thermophilic temperatures, which significantly reduce the viability of pathogens and weed seeds, and stabilize the carbon such that it is beneficial to plant growth.

The addition of the word “aerobic” stems from the consistent regulatory use of that term when defining compost. In 2015, the U.S. Food and Drug Administration (FDA) issued the final Produce Safety Rule as part of enacting the Food Safety Modernization Act (FSMA). This federal rule specifically describes two types of composting, both of which are required to maintain aerobic conditions. Public comments from the compost industry in the Spring of 2024 recommended organic regulations align with new language from the American Association of Plant and Food Control Officials (AAPFCO):

Compost – is the product manufactured through the controlled aerobic, biological decomposition of biodegradable materials. The product has undergone mesophilic and thermophilic temperatures, which significantly reduces the viability of pathogens and weed seeds, and stabilizes the carbon such that it is beneficial to plant growth. Compost is typically used as a soil amendment, but may also contribute plant nutrients

In the Fall of 2017, the NOSB passed [a recommendation](#) to the NOP regarding the exclusion of anaerobic digestate from a petition to amend §205.203(c), effectively eliminating that particular process from the compost umbrella as defined by organic regulations.

CS has included a reference to the National List in the definition for compost in order that producers, Material Review Organizations (MROs), certifiers, petitioners, adjacent industries, etc., can be clear in the understanding that CS is not taking a position on allowance of compostable packaging. CS is reinforcing the organic practice that all petitioned substances follow the same path for organic evaluation, through the National List process. Given organic language as it stands, how it is applied currently, and the considerations of public comments and industry feedback, CS sees the proposed definition as a balanced blend of regulatory frameworks around which organic regulations are situated and current science and practice of compost research, education and industry practices.

Updates to 7 CFR 205.203 - Soil fertility and crop nutrient management practice standard

Language at 7 CFR 205.203(c) describes composting methods, which are recognized to reduce pathogenicity sufficiently to allow for the application of manure composted by these means to organic crop fields without a 90-or-120 day preharvest interval.

Currently, organic regulations at 205.203(c)(2) state:

(c)(2) Composted plant and animal materials produced through a process that:

(i) Established an initial C:N ratio of between 25:1 and 40:1; and

(ii) Maintained a temperature of between 131 °F and 170 °F for 3 days using an in-vessel or static aerated pile system; or

(iii) Maintained a temperature of between 131 °F and 170 °F for 15 days using a windrow composting system, during which period, the materials must be turned a minimum of five times.

In the Spring 2024 Discussion Document, CS introduced 3 classifications of composting methods, followed by a request for comment on whether these categories accurately encompass the wide range of industry practices and how to situate time and temperature requirements that meet pathogen reduction standards for each method.

- *forced aeration compost/aerated static pile construction*
- *windrow/passively aerated composting systems*
- *contained and in-vessel composting method*

The time and temperature requirements embedded at § 205.203 are a reference to sanitation requirements for composting that arise out of U.S. Environmental Protection Agency (EPA) requirements for the treatment of wastewater biosolids. Composting is only one of the methods outlined in that system of oversight, but the requirements established at [USEPA 40 CFR Part 503](#) are commonly referred to as “PFRP” - “Process to Further Reduce Pathogens”. PFRP establishes the time and temperature requirements to reduce pathogens to an acceptably low level of risk for passing on disease or conditions that may negatively affect humans, plants or animals. The EPA rules are not a food safety standard but reference the treatment of sewage sludge.

Appendix B to Part 503—Pathogen Treatment Processes

B. Processes to Further Reduce Pathogens (PFRP)

1. Composting—Using either the within-vessel composting method or the static aerated pile composting method, the temperature of the sewage sludge is maintained at 55 degrees Celsius (131 F) or higher for three days.

Using the windrow composting method, the temperature of the sewage sludge is maintained at 55 degrees or higher for 15 days or longer. During the period when the compost is maintained at 55 degrees or higher, there shall be a minimum of five turnings of the windrow.

<https://www.govinfo.gov/content/pkg/CFR-2018-title40-vol32/xml/CFR-2018-title40-vol32-part503.xml#seqnum503.14>

As mentioned above, FSMA and the Produce Safety rule provide regulatory language to describe composting methods acceptable to FDA in mitigating risks from human pathogens found in biological soil amendments of animal origin (e.g. manure). In 21 CFR 112.54(b), the FDA has adopted the following composting standards into the “Standards for Growing, Harvesting, Packaging, and Holding of Produce for Human Consumption”.

<https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=112.54>

21 CFR 112.54(b) A scientifically valid controlled physical, chemical, or biological process, or a combination of scientifically valid controlled physical, chemical, and/or biological processes, that has been validated to satisfy the microbial standard in § 112.55(b) for *Salmonella* species and fecal coliforms. Examples of scientifically valid controlled biological (e.g., composting) processes that meet the microbial standard in § 112.55(b) include:

- (1) Static composting that maintains aerobic (i.e., oxygenated) conditions at a minimum of 131 °F (55 °C) for 3 consecutive days and is followed by adequate curing; and
- (2) Turned composting that maintains aerobic conditions at a minimum of 131 °F (55 °C) for 15 days (which do not have to be consecutive), with a minimum of five turnings, and is followed by adequate curing.

The CS finds it instructive that the FDA and EPA are aligned on systems for pathogen reduction that generally categorize composting systems as static aerated, within-in vessel or windrow composting methods and are seeking to align organic regulatory language with the federal frameworks within which Organic co-operates. Additionally, the CS is cognizant of the importance of [NOP Guidance 5021](#) alignment with FDA language that codifies the notion that these methods are not an exhaustive list of acceptable composting methods. Title 21 of the FDA regulations are explicit in the emphasis that methods are acceptable when they demonstrate a scientifically valid, controlled physical, chemical or biological process or a combination of those methods that demonstrates the reduction of pathogens that has been validated to meet microbial standards for pathogens of concern. CS intends for the change in categories to provide end users with clarity around which category their process falls within, what are the process requirements for each specific category and emphasize that while other methods can be allowed, producers falling outside of the processes described herein should provide exhaustive evidence of compliance which demonstrates a scientifically valid, controlled process which has been validated to satisfy microbial standards for pathogen reduction and/or can include those listed in 5021:

Certified operations can also demonstrate compliance with the compost requirements by measuring temperature, time, moisture content, chemical composition, and biological activity. These measurements may include testing feedstock materials and compost for one or more characteristics including initial and final carbon to nitrogen ratios, stability (using ammonia/nitrate ratio, O2 demand, CO2 respiration rate, or other standard tests), pathogenic organisms, or contaminants.

Public comments from the compost industry advocacy groups and research organizations were supportive of this recommended change in listing of composting methods. One written comment reflected support for the change noting “the updated language to be more inclusive to the wide range of commercial composting methods”. In another written comment, a material review organization supported the inclusion of specific composting methods, noting that it is extraneous to describe each possible method individually. A compost company supported the idea that narrow specifications should not be identified in regulations. In light of these comments, CS supports the new language with the understanding that NOP 5021 identifies alternative methods allowed in organic composting.

Contained and in-vessel composting methods are a grouping summarized by the Composting Handbook as “a diverse group of methods that confine the composting materials in whole or part within a building, container, or vessel” (Ed. Rynk, Robert, Black, Ginny, et al., pg. 271). The handbook discusses the difficulty of encompassing many of the methods as entirely contained or in-vessel, acknowledging that “containment is a common thread among this somewhat arbitrary grouping of methods” but that the commonality lies in that the structure of the compost making “rarely expose the composting process to the outdoors, and largely separates the composting materials (and their emissions) from the human composters overseeing the process” (pg. 271). The handbook lists some examples, including agitated bays/beds, turned vessels, aerated bays in halls, vertical silos, rotating drums, aerated tunnels/boxes, and moveable/modular aerated containers along with detailed explanations of the benefits of process isolation, separation and control. Each of these methods has variable requirements for how PFRP is met, including examples wherein the system of containment completes a first cycle of pathogen reduction and material is then moved to a windrow or forced aeration to complete the stabilization for finished compost. The Handbook notes that “in general, process control is more rigorous, often including monitoring of oxygen or carbon dioxide and moisture as well as temperature” (pg. 275). CS and public comments from the Spring meeting are in alignment that acknowledging in-vessel/container methods of composting in the regulation language is practical and applicable at review for allowance.

Given that the PFRP recommendations for two of the proposed categories are the same, CS is proposing to list contained/in vessel composting processes in the same category as mechanically forced aeration/aerated static pile composting processes in the same section of 205.203(c). The Composting Handbook describes the forced aeration/aerated static pile methods as using “fans to increase the airflow through the compost pile...[t]he increased airflow supports more efficient composting by limiting temperature rise, maintaining oxygen levels and by removing excess moisture, carbon dioxide and ammonia. The standard practice with forced aeration is to adjust the airflow rate to match the rate of biological heat generation” (pg. 200-201) in order to maintain compost temperatures above 131 °F.

Windrow composting relies on passive aeration and is a practice of “placing a mixture of organic feedstocks in long narrow piles called “windrows” that are then agitated or “turned” on a regular basis” (Composting Handbook 171). CS is proposing to update the regulatory language around windrow composting in part, due to the confusion that can arise from the dynamics embedded in the 15day time and temperature requirement. Windrow composting systems must hold core temperatures above 131F and are required to repeat the conditions for 5 turnings in order that the entire mass of the compost windrow has the opportunity to sit in the core of the windrow at temperatures, reducing the presence of pathogens of concern throughout the pile. The Composting Handbook notes that: “Turning the

windrow five times ensures that all of the material in the windrow spends time within the hot core. In contrast, aerated static piles and in-vessel systems are considered to be large enough or well-insulated enough to experience high temperatures throughout” (pg. 85). CS discussed the merits of requiring 3 consecutive days at core temperatures with 5 turnings for a total of 15 non-consecutive days but is choosing to de-emphasize that part of the requirement due to the lack of clear research demonstrating that particular necessity to achieve Pathogen Reduction. The industry has noted that pathogen reduction is being achieved successfully with a 15 total day requirement. The Compost Handbook illuminates other considerations which are valuable to healthy compost making in windrow systems. In the chapter on managing windrows under the section titled “Timing and Frequency of Turning” (pg. 181-182), The Compost Handbook reflects:

"when and how often turning takes place is usually dictated by the goals and preferences of the composter. In practice, the number of turnings and time between turnings varies greatly among composters.....some composters prefer to turn almost daily and may turn a given pile up to 40 times in the cycle. At the other extreme, relatively large windrows are turned only 3 or 4 times over a period of four months or more. At some operations, windrows are turned opportunistically - when operators have time, the weather is good, or the wind is blowing away from sensitive areas."

The Composting Handbook goes on to state:

"By monitoring the process conditions and the compost quality, operators learn the appropriate time intervals between turnings after gaining familiarity with the composting process and their feedstocks. At this point, turning often occurs at fixed time periods that accommodate the availability of labor and equipment.....the composting process affords a great deal of flexibility in this matter" CS emphasizes the importance of operator experience and the natural pathogen reduction tendency of a well managed aerobic composting process, along with the practical success the composters currently demonstrate in pathogen reduction. A regulatory reference to 3 consecutive days at core temps is not supported by external standards or extensive scientific research, and the CS acknowledges that level of regulatory specificity on windrow composting is not necessary and may create obstacles for windrow composters to meet the requirements. As pathogen reduction is being successfully achieved with 15 non-consecutive days and 5 turnings, CS has digested these dynamics and amended the language to reflect the reference which aligns with FSMA and EPA to produce regulatory/linguistic consistency.

CS wishes to reiterate support for the understanding conveyed in NOP Guidance [5021](#) that 205.203 is not an exhaustive list of allowed composting methods.

The NOP concurs with the NOSB that the examples provided in § 205.203(c)(1-3) is not a finite list of acceptable plant and animal materials for use in organic production. Site-specific variation in feedstock materials, management practices, and production requirements dictate that organic producers exercise flexibility in managing plant and animal materials on their operations.

For composting methods listed which may be categorized as “other” methods, 5021 provides a clear path for compliance:

“production practices should be described in the operation’s organic system plan (OSP). Certifying agents may allow the use of compost if they review the OSP and records and are

assured that all requirements are met. Compost production records should include the type and source of all feedstock materials. When animal materials are used in compost production, the certified operation should maintain temperature monitoring logs, and document the practices used to achieve uniform elevated temperatures.”

Additionally, NOP 5021 goes on to say

“Certified operations can also demonstrate compliance with the compost requirements by measuring temperature, time, moisture content, chemical composition, and biological activity. These measurements may include testing feedstock materials and compost for one or more characteristics including initial and final carbon to nitrogen ratios, stability (using ammonia/nitrate ratio, O₂ demand, CO₂ respiration rate, or other standard tests), pathogenic organisms, or contaminants.”

CS supports the use of an “other” category at material review for compost with the understanding that producers electing to be considered as such should provide exhaustive scientifically valid rationale for how the method satisfies microbial standards for pathogen reduction.

In regards to updating requirements for the C:N ratio – public comments from the compost industry acknowledged that C:N ratios are typically viewed by composters as a Best Management Practice (BMP) and should not be specifically prohibitive in regulation language. EPA and FDA regulatory language do not make reference to C:N ratios for establishing composting methods that meet requirements. Establishing initial C:N ratios requires the testing of what can be highly variable inputs/feedstocks, which is prohibitively expensive for compost makers and does not always result in a predictable C:N ratio in a finished compost product. Stakeholders noted that if the NOSB were to recommend a C:N ratio, it should be 20:1 – 60:1, which is more in line with current industry BMP. Additionally, stakeholders noted that a reference to final C:N ratios is a better path for demonstrating BMP throughout the composting process and is more useful to the end user. In discussion of the full Board in the Spring meeting and in Crops Subcommittee meetings, members expressed comfort with the idea of eliminating the C:N language or establishing a lower limit for finished compost. CS sees the potential for innovation in compost making as inevitable and supports alternative methods for allowance in organic compost making and does not at this time see the need to establish a lower limit for final C:N. Instead, we are proposing elimination of the C:N ratio requirement in the composting standards. In future, if producers/MROs/certifiers see concerns arise from eliminating this requirement, CS hopes they will bring the issue forward in the NOSB for full Board and stakeholder consideration.

In conclusion, the Crops Subcommittee has minimized the recommended changes to the language affecting organic compost production. We have heard from the community in public comments that our regulations are working well, and extensive change is not necessary and would be hugely disruptive. CS has considered the claims in BPI’s petition to the USDA and put forth a rationale for continued use of the National List process for considering compostable packaging as an allowed compost feedstock. Adjustments to the compost definition and time and temperature requirements are a reflection of current compost industry best practices and regulatory frameworks, which have established reasonable expectations for reducing pathogens of concern in organic compost systems. CS will continue to collaborate with the CACS on issues of testing, UREC, and contamination while making technical review

requests for future discussion documents and proposals towards continuous improvement. We acknowledge that contamination of organic compost is an emerging issue and that it should be monitored closely and re-addressed through the NOSB process.

Proposal

Motion to amend 205.2 Terms Defined:

Compost – The product of managed aerobic, biological decomposition of plant and/or animal materials, and/or permitted synthetic compost feedstocks at § 205.601(c). The product will have undergone mesophilic and thermophilic temperatures, which significantly reduce the viability of pathogens and weed seeds, and stabilize the carbon such that it is beneficial to plant growth.

Vote in Crops Subcommittee:

Motion by: Mindee Jeffery

Seconded by: Amy Bruch

Yes: 8 No: Abstain: 0 Recuse: 0 Absent: 1

Motion to amend § 205.203(c) Soil fertility and crop nutrient management practice standard:

(2) Composted plant and animal materials and/or permitted synthetic compost feedstocks at § 205.601(c) produced through a process that:

- (i) Maintains aerobic conditions at a minimum temperature at or above 131 F for 3 days using a contained/in-vessel process or a mechanically forced/aerated static pile process; or
- (ii) Maintains aerobic conditions in a windrow process at or above 131 F for 15 days (which do not have to be consecutive), during which period, the materials must be turned a minimum of 5 times.

Vote in Crops Subcommittee

Motion by: Mindee Jeffery

Seconded by: Logan Petrey

Yes: 8 No: 0 Abstain: 0 Recuse: 0 Absent: 1

Appendix A – Redline of Proposed Changes Definitions and 205.203

§ 205.2 Terms Defined

Compost. ~~The product of a managed process through which microorganisms break down plant and animal materials into more available forms suitable for application to the soil. Compost must be produced through a process that combines plant and animal materials with an initial C:N ratio of between 25:1 and 40:1. Producers using an in-vessel or static aerated pile system must maintain the composting materials at a temperature between 131 °F and 170 °F for 3 days. Producers using a windrow system must maintain the composting materials at a temperature between 131 °F and 170 °F for 15 days, during which time, the materials must be turned a minimum of five times.~~ managed aerobic, biological decomposition of plant and/or animal materials, and/or permitted synthetic compost feedstocks at § 205.601(c). The product will have undergone mesophilic and thermophilic temperatures, which significantly reduce the viability of pathogens and weed seeds and stabilize the carbon such that it is beneficial to plant growth.

§ 205.203 Soil fertility and crop nutrient management practice standard

(c) (2) Composted plant and animal materials and/or permitted synthetic compost feedstocks at § 205.601(c) produced through a process that:

~~(i) Established an initial C:N ratio of between 25:1 and 40:1, and~~

~~(ii) (i) Maintained a aerobic conditions at a minimum temperature of between at or above 131 °F and 170 °F for 3 days using an a contained/in-vessel or mechanically forced/aerated static aerated pile system process; or~~

~~(iii) (ii) Maintained aerobic conditions in a windrow process at or above a temperature of between 131 °F and 170 °F for 15 days (which do not have to be consecutive), using a windrow composting system, during which period, the materials must be turned a minimum of five times.~~

