NATIONAL ORGANIC COALITION

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Ohio Ecological Food and Farm Association

Organic Seed Alliance

PCC Community Markets

Rural Advancement Foundation International -USA

September 30, 2021

National Organic Standards Board
USDA – AMS
1400 Independence Ave, SW
Washington, DC 20250

RE: AMS-NOP-21-0038

NOC Comments to the National Organic Standards Board

FALL 2021

October 19-21, 2021
Virtual Meeting

National Organic Standards Board:

The National Organic Coalition (NOC) is a national alliance of organizations working to provide a "Washington voice" for farmers, ranchers, environmentalists, consumers, and industry members involved in organic agriculture. NOC seeks to advance organic food and agriculture and ensure a united voice for organic integrity, which means strong, enforceable, and continuously improved standards to maximize the multiple health, environmental, and economic benefits that organic agriculture provides. The coalition works to assure that policies are fair, equitable, and encourage diversity of participation and access.

Below we provide comments on a wide range of topics for consideration by the Board.

NATIONAL ORGANIC COALITION

Contents

State of the USDA National Organic Program

NOC has identified and prioritized six issues for early action by the Biden Administration and Agriculture Secretary Vilsack. While we are encouraged by some of the actions USDA has taken to address these six top priority topics, none is yet across the finish line. We have asked that USDA:

1. **Reinstate the Organic Livestock and Poultry Practices Rule**. In an important milestone for the organic community, Secretary Vilsack announced on June 17, 2021, that USDA will "reconsider the prior Administration's interpretation that the Organic Foods Production Act does not authorize USDA to regulate the practices that were the subject of the 2017 Organic Livestock and Poultry Practices (OLPP) final rule,"including meaningful outdoor access for organic chickens and other animal welfare improvements." The Secretary "directed the National Organic Program to begin a rulemaking to address this statutory interpretation and to include a proposal to disallow the use of porches as outdoor space in organic production."[1]

NOC believes USDA must be held accountable to reinstating the rule in a meaningful way. For this reason, NOC is a plaintiff in litigation led by Center for Food Safety challenging the withdrawal of the rule. This litigation will go to briefing on its merits later this fall.[2] NOC is seeking a legal outcome that will make it clear that the USDA has authority to move forward with the Organic Livestock and Poultry Practices rule and to set aside the Withdrawal Rule, reinstating the OLPP.

2. **Finalize an enforceable and meaningful Origin of Livestock rule without delay.** The importance of this issue has become even more obvious with announcement in August 2021 by Danone (owner of Horizon Organic) of plans to end contracts with 89 organic dairy farmers in VT, NH, ME, and parts of Northern NY state. The continuation of loopholes in how conventional cows are transitioned into organic herds enables these types of business decisions because it increases the ability to ramp up production very quickly on larger dairy operations. Companies like Horizon Organic are then able to source milk more cheaply from operations making use of loopholes.

Origin of Livestock rules have contributed to the oversupply situation that has put smaller and mid-sized organic dairies in peril. The dairies that have been dropped by Horizon Organic will have an extremely difficult time finding other buyers and the results could be devastating for these family dairies, as well as for the affected communities.

NOC submitted comments for a third time to USDA on Origin of Livestock in July 2021.[3] In those comments, we explained why we believe that clearly prohibiting the sale of "transitioned" cows as organic is critical to closing existing loopholes in the regulations. NOC is taking every opportunity available to us to urge USDA to finalize the rules without delay, and we have asked Congress to help us push for their completion.

3. **Move expeditiously to finalize the Strengthening Organic Enforcement Rule.** This rulemaking started in response to provisions that NOC and others worked to include in the 2018 Farm Bill to require USDA to implement regulatory changes to improve the integrity of organic supply chains.

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[1] https://www.usda.gov/media/press-releases/2021/06/17/statement-agriculture-secretary-tom-vilsack-organic-livestock-and

[2] Amended complaint challenging USDA withdrawal of OLPP: https://app.box.com/s/klwunwmgho5qmhnszetdvhep8jjdezq7

[3] NOC Comments on Origin of Livestock: https://app.box.com/s/9j9ol42m2hudme866ivbclzafa4wkoc7

This massive proposed rule is the most significant revision to the organic regulations since their publication in 2001. NOC submitted detailed comments on the proposed rule in the fall of 2020.[4] This critical rule must be finalized as urgently as possible.

4. **Restore the Organic Certification Cost Share Program to the full reimbursement rates.** The Trump administration slashed reimbursement levels in August of 2020, during a period of higher costs and disrupted markets caused by the pandemic. On June 15, 2021, the current administration announced that they had set aside up to $20 million in additional funds to help with organic certification cost share.[5] Unfortunately, USDA has not yet communicated the details of how these additional funds will be made available to farmers and the cost share program has rolled out once again in 2021 with lower reimbursement rates.

5. **Embrace organic agriculture as a key climate change solution.** As part of the $3.5 trillion reconciliation package, Congress is proposing to increase funding for the Organic Research and Education Initiative (OREI) with a focus on organic's role in combatting climate change and to allocate $28 billion in additional funds for USDA conservation programs, two requests NOC has been pushing. In recognition of organic's potential as a climate change solution, NOC is also urging that USDA establish a $50 million grants program to provide funds to organic and sustainable agriculture organizations in all regions of the country to administer mentorship programs and technical assistance for beginning organic farmers. Existing organic farmers would help mentor the beginning farmers, and both the mentor and mentee would be eligible to receive stipends as part of the program.

6. **Build our food system back better than before, using the lessons of the pandemic.** Building back better means using the lessons of the pandemic to create a more resilient food and farm system and to take actions to reduce disparities in our society. It means ensuring that Black and Indigenous farmers, and other farmers of color and communities of color, are not left out in efforts to rebuild the economy and recover from the pandemic.

The Biden administration has allocated a total of $5 billion, to date, in pandemic assistance funds to its 'build back better' initiative, including $500 million for expanding meat and poultry processing capacity and up to $20 million in additional organic certification cost share assistance.

Through a series of USDA comment periods, NOC has submitted detailed comments on:

a. Supply chain resiliency and the role of organic as a climate change solution.[6]
b. Advancing racial equity and justice at USDA, including opportunities to address barriers that people of color and underserved communities face in accessing organic certification through the USDA National Organic Program.[7]

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[4] NOC Comments on Strengthening Organic Enforcement Rule: https://www.nationalorganiccoalition.org/blog/2020/10/6/noc-comments-on-far-reaching-proposed-changes-to-usda-organic-regs

[5] NOC Press Release on Organic Certification Cost Share: https://www.nationalorganiccoalition.org/blog/2021/6/15/noc-applauds-secretary-vilsack-for-providing-additional-organic-cost-share-assistance

[6] NOC Comments to USDA on Supply Chain Resiliency: https://app.box.com/s/4jm4dpc96aletq5yn177jq3lmhurvxna

[7] NOC Comments to USDA on Racial Equity and Justice: https://app.box.com/s/oujah67ktfjtluq9zht895c7g7ek53sr

c. The need for more organic meat and poultry processing capacity. The meat and poultry category is one of the least developed parts of the organic market, in large part because of the challenges associated with processing capacity. NOC has recommended that USDA conduct feasibility studies and support cooperative models of organic production and processing to encourage organic meat and poultry production in tandem with the processing capacity to support the production.[8]

NOSB Role

NOC urges the NOSB to use every opportunity available to push for the completion of the Strengthening Organic Enforcement and Origin of Livestock rules and the reinstatement of the Organic Livestock and Poultry Practices rule.

The NOSB should communicate directly with the Secretary about the importance of the organic certification cost share program and the need to restore the program, make the application process less burdensome, provide more timely reimbursements, and increase reimbursement rates to at least $1,000 per scope annually to reflect the increasing cost of organic certification.

NOC appreciates the letter the NOSB is sending to Secretary Vilsack about the role of organic agriculture as a climate change solution. We hope the NOSB will continue to elevate issues of critical importance with the Secretary, particularly for cross-cutting issues for which USDA has a role to play in advancing and protecting organic in programs and policies that extend beyond the National Organic Program.

Our previously submitted comments on that letter are included as Appendix A. We thank the NOSB for describing more fully the research that demonstrates that organic farms are more resilient to droughts, floods, and extreme weather events in the second draft of this letter.

As we describe below, NOC urges the NOSB to prohibit ammonia extracts and limit the use of high nitrogen fertilizers (see Appendix B for detailed comments on this topic.) Ammonia extracts and an overreliance on high nitrogen fertilizers can cause harm to soil organisms and heavy reliance on these products is inconsistent with organic principles. Operations that rely on these high nitrogen fertilizers may be bypassing the soil building practices (i.e. cover cropping, crop rotations, applications of compost) that are integral to the ability of organic systems to sequester carbon. Overreliance on these materials may also result in increased greenhouse gas emissions.[9] In past comments, NOC has documented research demonstrating that large quantities of ammonia/ammonium are caustic, decrease soil pH, and can decrease soil biotic activity.

Finally, NOC has also recommended that the NOSB create a Diversity, Equity, and Inclusion Subcommittee to explore opportunities to reduce racial disparities in the National Organic Program and to develop social justice standards for organic certification (see pages 10-14).

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[8] NOC Comments on Meat and Poultry Processing Capacity: https://app.box.com/s/bt0wdzyl3m2sli3ouccvklmb41emchgv

[9] For example, the following study demonstrates that the application of nitrogen, without additional carbon, can lead to soil carbon losses. "The Myth of Nitrogen Fertilization for Soil Carbon Sequestration": https://acsess.onlinelibrary.wiley.com/doi/abs/10.2134/jeq2007.0099

We urge the NOSB to ask USDA to describe the progress they have made and future plans on the six above priorities as part of the opening session with Under Secretary Moffitt and Deputy Administrator Tucker on October 19.

NOC Recommendations for Reforms

Beyond these top six priorities that we have identified for immediate action to strengthen the organic program and advance organic agriculture, NOC recognizes that we need to see significant shifts in the way the NOP functions and in the interactions between the organic community and USDA. With a new administration in place, we feel that it is critical to push for changes to elevate the role of the National Organic Standards Board and to shift the culture at USDA to one of more vocal and meaningful support for organic agriculture. We are asking Secretary Vilsack, Under Secretary Moffitt, and Deputy Administrator Tucker to lead in making these important changes.

Our recommendations below can be accomplished through administrative action and do not require new legislation to implement.

I. Elevating the Role of the National Organic Standards Board

When the organic law was written in 1990, the USDA was largely uninformed and skeptical about organic agriculture. The National Organic Standards Board (NOSB) was established with a careful balance of representatives from different organic stakeholder groups to ensure that the organic program at the USDA remained closely linked to the organic community and to provide a mechanism to protect the integrity of the organic program. The transparent, public process that accompanies NOSB deliberations helps maintain trust in the organic seal. But the NOSB process has been weakened and critical reforms are essential to ensure that the program is working as intended. NOC is asking USDA to:

1. **Create a transparent NOSB appointments process.** As part of the appointments process, USDA should publish the names, titles, and affiliations for all NOSB applicants in NOP's publication, the *Organic Insider,* to give organic stakeholders the opportunity to give input about the candidates.
2. **Reduce barriers to NOSB service.** USDA should provide farmers who serve on the NOSB with stipends to cover the cost of hiring on-farm labor while participating in and traveling to and from NOSB meetings. USDA should also consider providing stipends to individuals affiliated with low-resource non-profit organizations and other individuals who serve on the NOSB without support from their employer. NOC also supports allowing NOSB members to hire assistants, who can help with research and preparation, to ease the workload associated with NOSB service.
3. **Act on NOSB recommendations.** USDA should clear the long backlog of NOSB recommendations that have languished at USDA. Going forward, the NOP should provide a written explanation, with a clear justification, to the NOSB and public stakeholders within 60 days for any NOSB recommendations that they do not plan to implement. The NOSB should have the opportunity to revisit recommendations and address objections raised by USDA.
4. **Provide the NOSB with autonomy to set their work agenda.** The NOP controls the NOSB's work agenda. The NOSB should have the opportunity to identify and prioritize topics for inclusion in the work agenda that are brought forward by subcommittees in the course of their work or by organic stakeholders.
5. **Reverse the 2013 policy change to the sunset process for synthetic materials on the National List.** The 2013 changes to the sunset process for synthetic materials on the

National List are contrary to the requirements of the Organic Foods Production Act of 1990 and the continuous improvement principle that is foundational to organic. The changes were made without the necessary public notice and comment process.

In addition, the NOSB should request that the NOP provide an update on all previous NOSB recommendations made with a plan and timeline for implementing these recommendations.

II. Activating Support for Organic Agriculture Across USDA Agencies

We believe it is time for USDA to actively discuss the environmental, quality of life, and health benefits of organic agriculture, including its contributions as a climate-friendly system of agricultural production and its human health benefits related to the reduction in toxins in food production and processing. To date, USDA has treated organic as simply a marketing scheme. We are asking that USDA be willing to promote the benefits of organic agriculture in helping reach its goals to build a more resilient and healthier food system and to uphold a strong organic program to meet the expectations of organic farmers and consumers. NOC is asking USDA to:

1. **Support existing and transitioning organic producers.** USDA should provide meaningful support to existing organic farmers through a well-functioning organic certification cost-share program; by making sure existing conservation, crop insurance, and loan programs are working for organic producers; and by investing more money in organic research. In addition, USDA should implement a meaningful and thoughtful program to support the expansion of organic agriculture and help more farmers transition to organic. The focus of this transition program should be on those sectors for which domestic production is falling short of demand in the marketplace. USDA should also support the development of new markets for organic products.
2. **Protect organic integrity.** USDA must prohibit systems of production that do not meet organic standards from being certified as organic. Monocultural farming systems, hydroponic farming, and confined animal feeding operations (CAFOs) should not be certified as organic because these operations fail to meet the requirements in the organic law and regulations for use of farming practices that foster soil fertility and provide animals with the opportunity to exhibit their natural behaviors.
3. **Crack down on fraud.** USDA must strengthen oversight and enforcement that deters, detects, and punishes domestic and import fraud of organically labeled products.
4. **Establish independent oversight of the NOP accreditation program.** Currently, oversight over the NOP's accreditation system takes place through an annual "Peer Review Panel." For truly independent and effective oversight, members of the panel must have demonstrated knowledge of organic certification and accreditation and should use a risk-based focus of review. The NOP should work with a third party with organic accreditation and oversight experience and publicly release the full peer review panel report.
5. **Create a more diverse & inclusive organic program**. USDA should address barriers for Black, Indigenous, and other farmers of color, including challenges accessing land, resources, and technical assistance, to create a more diverse, robust, and inclusive organic program.
6. **Address unfair treatment of farmers and improve competition in markets.** USDA should update Packers and Stockyards Act regulations to address unfair, deceptive, and discriminatory practices by meatpackers and poultry companies in their dealings with farmers.
7. **Increase procurement of organic products in federal nutrition assistance programs.** USDA should devote $100 million annually to purchase culturally appropriate, organic products in

federal nutrition assistance programs, including the National School Lunch program, the Commodity Supplemental Food Program, The Emergency Food Assistance Program (TEFAP), and Food Distribution Program on Indian Reservations (FDPIR).

8. **Protect organic farmers from pesticides and genetic drift.** The requirement to create buffer zones or otherwise prevent drift should be transferred from organic producers to those using pesticides and genetically engineered (GE) crops.
9. **Compensate organic farmers who experience contamination from drift from pesticides and GE crops.** When organic and non-GE farmers experience market losses due to pesticide and GE contamination, the manufacturer and patent holder of the pesticides and GE technology should be held liable for those damages, since those companies control the terms of use of those technologies by farmers.

Racial Equity

Recommendations for NOSB Action to Promote Racial Equity in Organic

NOC has previously presented data and context to both the USDA and NOP regarding the persistent structural racism in our agricultural system, which has excluded most Black, Indigenous, and other farmers of color (BIPOC farmers) from land ownership, farming, and participation in the organic movement over time. We have submitted comments to the USDA on racial equity, outlining ways in which that department can work to improve its practices (Appendix C – Spring 2021 NOSB Comments on Racial Equity). Now, we turn to our own system and reflect on how we can ask our own NOSB and the US organic community to keep the tenets of fairness and inclusivity at the forefront of our work.

We offer the following recommendations:

1. **Establish a Diversity, Equity, and Inclusion Subcommittee within the NOSB.**

To make sure this topic receives the time and attention it deserves, we ask the NOSB to establish a Diversity, Equity, and Inclusion (DEI) Subcommittee to lead this work on the part of the Board. We know the NOSB has a set call schedule and recommend the merging of the policy subcommittee with the CACS to make room for this important work. In having a subcommittee with the purpose of moving DEI work forward within organic, the NOSB will build-in its own review process to ensure we challenge, and do not repeat, patterns of structural racism. The DEI subcommittee should establish a research and policy agenda aimed at identifying, understanding, and dismantling barriers to organic certification for BIPOC producers, including: land access challenges, inadequate access to capital and other resources, language barriers and paperwork burdens, insufficient regionally and culturally appropriate technical assistance, lack of established organic supply chains in regions that are underrepresented in the organic sector, mistrust of USDA programs and staff resulting from longstanding and ongoing discrimination, and appropriation of traditional cultural knowledge. The subcommittee should also engage directly with food justice groups and communities to understand barriers to purchasing organic food, especially for people of color.

The NOSB should work with the NOP to establish a structure that invites and compensates BIPOC producers and other stakeholders to offer guidance and feedback to the DEI subcommittee. The subcommittee's future recommendations should include changes that would make the certification process more accessible to producers of color, make organic food more affordable and available, and ensure that organic farming pays living wages for farm workers and farmers.

2. **Prioritize research examining barriers to participation of BIPOC farmers in organic certification.**

A first step to addressing disparities in representation is understanding the source of these disparities and underrepresentation.

(1) NOC encourages the NOSB to prioritize research into **understanding barriers to participation in organic certification for BIPOC farmers**. This research should include information about institutions and policies that have perpetuated discrimination and provide relevant information to support the actions of USDA's Office of the Assistant Secretary for Civil Rights. Research into barriers to participation in organic certification should also support the development of technical assistance and outreach specifically designed to best serve BIPOC farmers and the unique challenges they face.

(2) BIPOC farmers have been dispossessed of land and that has impacted their participation in agriculture as farm owners, as well as participation in the organic program. The NOSB should prioritize **research to understand how access to land has impacted participation in the organic program** and actions that could address this barrier. In July of 2021, NOC submitted written comments to USDA asking that USDA address the challenges BIPOC farmers face in accessing land.[10] The NOSB should also examine the ways in which contamination of BIPOC-owned land impacts participation in organic certification and advocate for policies that ensure that BIPOC farmers gain access to land free of contamination, rather than less-value, contaminated land.

(3) NOC supports a research priority area suggested in Union of Concerned Scientists' Policy Brief in May 2020, to **develop "markets for ethnic specialty crops and culturally relevant fruits and vegetables**, leveraging the skills of immigrant and refugee farmers, helping them thrive while also contributing to local economies."[11] NOC also supports reexamining the national organic marketplace to support organic small farms, inclusive of Black and Indigenous small farmers.

(4) NOC supports research **to limit and avoid the contamination of Black and Indigenous farmlands and conservation lands** by off farm sources and neighboring farms.

(5) Furthermore, as outlined by former NOSB member A-dae Romero-Briones in an insightful article for the fall 2020 issue of Organic Farmers Association's New Farms Magazine,[10] grower group certification could create a path to infrastructure development for not only many Indigenous and Tribal growers, but for marginalized small-scale growers as well. NOC encourages the NOSB to **consider looking closely at grower groups as a potential means to increase organic certification for BIPOC farmers**.

3. **Advocate cost share funding**

The NOSB should strongly advocate for a well-functioning and well-publicized organic certification cost share program since this program is so important to small operations and underserved farmers. USDA should increase efforts to ensure that BIPOC producers are aware of this opportunity for support given that many BIPOC producers do not know about the cost share program and are concerned about the cost of certification.

4. **Targeted Outreach, Technical Assistance, and Equity of Information and Infrastructure within Organic Spheres**

[10] NOC Comments to USDA on Racial Justice and Equity: https://app.box.com/s/oujah67ktfjtluq9zht895c7g7ek53sr
[11] (May 2020) Union of Concerned Scientist & HEAL Food Alliance Policy Brief https://www.ucsusa.org/sites/default/files/2020-06/leveling-the-fields.pdf

Technical assistance and outreach must serve BIPOC farmers, **recognizing traditional ecological knowledge and management as best practices**. The contributions made by BIPOC individuals and communities to organic and sustainable food systems are vast and often go unacknowledged.

NOC encourages the NOSB to recommend that USDA **support investment in community programs offering materials in multiple languages and formats, providing translation assistance, and streamlined paperwork.** NOC was pleased to see that the NOP updated their website to include documents and resources available in Spanish. NOC encourages the NOSB to work with the NOP to identify other languages that the organic materials should be translated into and which materials are most frequently utilized, and then work to identify the appropriate means of acquiring those translated materials.

The NOSB should also recommend that the NOP reenergize previous outreach and education efforts on organic agriculture, with a **specific focus on outreach to socially disadvantaged groups and ensuring this information is accessible** (language, where the information is found, dissemination strategies, etc.). Examples of such previously existing programs include:

- The "*Sound and Sensible Initiative*," identifying and removing barriers to certification, streamlining the certification process, focusing enforcement, and working with farmers and processors to correct small issues before they become larger ones, with the overall goal to make organic certification accessible, attainable, and affordable for all operations.
- "*Organic 101" series*,[12] a USDA blog post series that explored different aspects of the USDA organic regulations in a digestible format.
- The *Organic Integrity Learning Center*. This resource could be widely promoted and made available to farmers. Modules could include farmer-focused lessons on organic transition, the organic certification and inspection processes, and common practices required in organic production, but which sometimes pose challenges for organic producers, such as cover cropping, crop rotation, and organic weed management.

For the outreach and support to be truly relevant, we encourage the NOSB to support the hiring of linguistically and culturally competent representatives both at the certifier level, and at the agency level (USDA NOP, FSA, NRCS, and other USDA agencies). We also encourage the NOSB to support partnerships with local organizations that have high levels of trust with local communities.

5. Advocate for Structural Changes within USDA

Appropriate and relevant representation is necessary to reach a truly equitable system. NOC encourages the NOSB to **foster leadership of BIPOC participants in decision-making venues, including grant panels, advisory boards, and committees.**

NOC is pleased to see the establishment of an Equity Commission Advisory Committee and Equity Commission Subcommittee on Agriculture[13] who will advise the Secretary of Agriculture by facilitating identification of critical USDA programs, policies, systems, structures, and practices that contribute to

[12] Organic 101: Five Steps to Organic Certification, USDA blog, February 2017 https://www.usda.gov/media/blog/2012/10/10/organic-101-five-steps-organic-certification

[13] Intent To Establish an Equity Commission and Solicitation of Nominations for Membership on the Equity Commission Advisory Committee and Equity Commission Subcommittee on Agriculture https://www.federalregister.gov/documents/2021/09/27/2021-20840/intent-to-establish-an-equity-commission-and-solicitation-of-nominations-for-membership-on-the

barriers to inclusion or access, systemic discrimination, or exacerbate or perpetuate racial, economic, health and social disparities. This is in line with some of NOC's previous recommendations (Appendix C).

NOC recommends that the NOSB could advocate that the Equity Commission and USDA's office of the Assistant Secretary for Civil Rights take the following actions:

- Address claims of discrimination in agricultural credit, land credit and markets, conduct oversight of USDA practices.
- Examine the role of heirs' property in the loss of land for Black farmers, and offer education and technical assistance for families to retain property.[14,15]

The NOSB could also consult with federal advisory committees and organizations representing BIPOC farmers, such as the Native American Farmers and Ranchers Federal Advisory Committee, on issues related to organic agriculture, organic standards, and BIPOC participation in organic certification.

6. Add Fairness standards to the NOSB work Agenda and work to develop them

Given that the Biden Executive on Promoting Competition in the American Economy[16] sets the priority for development of fairness labeling so consumers can support fairness for farmers and workers ("*measures to encourage improvements in transparency and standards so that consumers may choose to purchase products that support fair treatment of farmers and agricultural workers and sustainable agricultural practices[3]*"), NOC recommends that the NOSB engage in a public consultation process to develop to develop social justice standards for the National Organic Program. The NOSB should add this topic as a work agenda item.

NOC recommends using IFOAM's Principles of Fairness[17] as a starting point for discussion.

The Principles are as follows:

- Organic Agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities
- Fairness is characterized by equity, respect, justice, and stewardship of the shared world, both among people and in their relations to other living beings.
- This principle emphasizes that those involved in organic agriculture should conduct human relationships in a manner that ensures fairness at all levels and to all parties – farmers, workers, processors, distributors, traders, and consumers. Organic agriculture should provide everyone involved with a good quality of life and contribute to food sovereignty and reduction of poverty. It aims to produce a sufficient supply of good quality food and other products.
- This principle insists that animals should be provided with the conditions and opportunities of life that accord with their physiology, natural behaviors, and well-being.

[14] High Country News, Land Grab Universities (March 2020) https://www.hcn.org/issues/52.4/indigenous-affairs-education-land-grab-universities

[15] March 25, 2021 House Agriculture Committee "State of Black Farmers in the US." hearing. https://agriculture.house.gov/calendar/eventsingle.aspx?EventID=2141

[16] https://www.whitehouse.gov/briefing-room/presidential-actions/2021/07/09/executive-order-on-promoting-competition-in-the-american-economy/

[17] IFOAM Principles of Fairness https://www.ifoam.bio/why-organic/principles-organic-agriculture/principle-fairness

At the recent IFOAM-Organic International General Assembly[18], members voted by a large margin for IFOAM-Organics International to proactively work for the inclusion of social justice standards in organic certification programs around the world. Organic consumers expect that, just like the environmental standards, the social standards on organic farms are higher than conventional. Standards for social justice encompass fair payments to farmers, fair conditions of trade between buyers and organic farmers, and fair, decent, respectful, and adequately compensated working conditions for farm workers and other food system workers in the organic value chain.

The NOSB should also refer to the Food Justice Certified (FJC) standards[19] developed by the Agricultural Justice Project, which were developed over a four-year period of stakeholder input—involving farmers, farmworkers, interns and apprentices, and indigenous, retail, and consumer groups—and are an attempt to codify in concrete terms what making a legitimate claim of "social justice" in organic and sustainable agriculture means.

We thank the Board for your attention to these matters and urge your prompt action on these recommendations.

Other

Accuracy of Representation Matters

Accuracy of representation matters when NOSB members present a summary of public comment received on a material, petition, or other issue. For example, summaries of comments received on materials are often misinterpreted by the lead, stating that all comments are in favor of relisting when, in fact, the majority of the comments may have come from certifiers who merely provide the number of operations certified by them that list that material on the materials used list of their organic system plan (OSP).

This regularly occurs with certifier comments. Certifiers often note the number of operations that list a material on their OSP; however, this does not accurately represent the number of operations that are, in actuality, using that material. Specifically, this number does not accurately reflect the actual use of a material, and therefore does not equate with necessity or essentiality.

Minority Opinions in NOSB Subcommittee Decisions & Published Materials

NOC urges NOSB subcommittees to include minority opinions in their published materials. The omission of minority opinions does a disservice to the democratic process and all of the expertise that comes to this board. The minority views inform the deliberations of the whole board, reflect ranges of views of all stakeholders, and are common to FACA boards. The lack of a statement of minority opinion stifles informed decision making.

[18]IFOAM 2021 General Assembly https://www.ifoam.bio/about-us/our-network/general-assembly/general-assembly-2021

[19] Food Justice Certified (FJC) standards https://www.agriculturaljusticeproject.org/en/learn-more/

The organic community has a long-standing commitment to transparency, and the NOSB itself is on record as believing in transparency and creating better decision making. The unanimous vote supporting an open docket recommendation is a demonstration of the NOSB's commitment to transparency.

Minority views inform the deliberations of the board, sharing the views of individuals with expertise that needs to be heard. Including them helps to ensure that the views of all stakeholders are heard, which is an important reason for the existence of advisory committees under the Federal Advisory Committee Act.

Unfortunately, it is often the case that those who opposed a proposal in subcommittee do not share their reasoning in full board discussions. Since those full board deliberations are often conducted under time pressure, a presentation of minority views in the written materials would create greater understanding in the board and the public without adding additional time to public meetings. Stakeholders submitting written comments would also benefit from a more complete understanding of the issue, leading to more useful comments and better decisions.

Providing minority views reflects the federal process for documenting public input and can better serve the NOP in its work. Understanding the reason behind a requirement always helps with greater buy-in and support. When the NOP publishes a rule for public comment, it must explain the reasoning leading up to it, and the inclusion of all the issues discussed in NOSB materials would facilitate this work.

Compliance, Accreditation, & Certification Subcommittee (CACS)

Discussion Document

Oversight improvements to deter fraud: Modernization of organic traceability infrastructure

NOC appreciates the CACS working to identify gaps that require further action to address enforcement challenges. While we appreciate the importance of the technological aspects of this work, the most challenging barriers to organic integrity continue to be systemic within the USDA and NOP.

The integrity of the organic seal and the market for organic products is harmed in the absence of stringent enforcement of regulations that provide a level playing field for all. It is imperative, now more than ever, that the NOSB develop recommendations for additional regulatory oversight procedures that clearly recognize and address where our current system falls short, and that the NOP has the will and resources to enforce such regulations.

Peer reviews can help identify opportunities to reduce fraud.
NOC urges the NOSB to make additional recommendations to strengthen oversight of the NOP's accreditation functions. Currently, oversight over the NOP's accreditation system takes place through an annual "Peer Review Panel." NOC believes oversight of the NOP's accreditation process should be strengthened.

For truly independent and effective oversight, members of the panel must have demonstrated knowledge of organic certification and accreditation. Membership should be determined by an outside entity, which might include members of the NOSB, and the panel should have the authority to request any files and look at any certifiers that it judges to be appropriate. The peer review panel should use a risk-based focus of review (for example, by examining NOP accreditation of international certifiers for high-risk regions or by examining areas of inconsistency between certification agencies). The agreement with the peer review auditor should be a multi-year agreement to ensure that the peer review entity has the ability to track the

NOP's corrective actions and compliance with issues that arise from the peer review audit. NOC is pleased to see that recent audits conducted by the American National Standards Institute (ANSI) have noted the areas identified for corrective actions that remain unresolved.

NOC recommends that the NOP work with IOAS (International Organic Accreditation Service), headquartered in North Dakota to conduct annual peer review audits. This international organization accredits numerous organic certification entities around the world and understands how organic certification works both on-site at the various operations as well as within the certification body's offices. They are an independent technical expert that verifies organic certifiers are competent to implement and verify the rules they expect their clients to follow. One of the weaknesses with the previous NOP "peer reviews" was the lack of familiarity with organic systems and the organic certification process. IOAS, like the American National Standards Institute (ANSI), is a member and signatory of the International Accreditation Forum, but through its long experience and specific focus on the organic sector, IOAS would bring both rigor and understanding of organics to the NOP peer review process.

Poultry animal welfare standards are required.
Unequal enforcement of federal organic standards has been an ongoing problem in the organic poultry and egg sector. To address this problem, USDA published a long overdue regulation to require all organic poultry and egg operations to provide meaningful outdoor access for chickens in compliance with the law. The Organic Livestock and Poultry Practices rule has been withdrawn by USDA, which sends the wrong message to consumers and a market that is reliant on public trust in the certified organic label. Most certified operations already meet the standards in the withdrawn rule, but the rule would have helped to create more uniformity in meeting the needs of organic farmers and consumers alike. The NOSB has spoken unanimously about the Board's ongoing support for this rule, most recently offering a resolution at the spring 2021 meeting. In presenting this resolution, Board member Nate Powell-Palm said it best, "The community is as unified today as it was four years go" on this matter.[20]

In an important milestone for the organic community, Secretary Vilsack announced on June 17 that USDA will "reconsider the prior Administration's interpretation that the Organic Foods Production Act does not authorize USDA to regulate the practices that were the subject of the 2017 Organic Livestock and Poultry Practices (OLPP) final rule."[21]

NOC believes USDA must be held accountable to reinstating the rule in a meaningful way. For this reason, NOC is a plaintiff in litigation led by Center for Food Safety challenging the withdrawal of the rule. This litigation will go to briefing on its merits later this fall.[22] NOC is seeking a legal outcome that will make it clear that the USDA has authority to move forward with the Organic Livestock and Poultry Practices rule and to set aside the Withdrawal Rule, reinstating the OLPP.

Dairy pasture rule enforcement is required.
In 2010, after an open and transparent public rulemaking process, USDA put into place a detailed set of rules to ensure that all certified organic dairy farmers were giving their animals meaningful access to pasture. Similar to the current poultry situation, most dairy farmers were already meeting that standard, but a few very large dairy operations were using a loophole in the regulations to skirt those requirements. However, in some cases, dairy enforcement is still falling short, and some large operations continue to

[20] Transcript, Spring 2021 NOSB Meeting, p818.
[21] https://www.usda.gov/media/press-releases/2021/06/17/statement-agriculture-secretary-tom-vilsack-organic-livestock-and
[22] https://app.box.com/s/klwunwmgho5qmhnszetdvhep8jjdezq7

deny their animals meaningful access to pasture. This failure to adequately enforce access to pasture has a profound impact on the majority of organic dairy producers who do provide adequate access and are losing access to processors who can buy cheaper milk from those who do not comply. NOC appreciates the increased efforts the NOP has undertaken as part of the Livestock Compliance initiative, and we encourage continued scrutiny to examine areas of risk for fraud in the livestock sector.

Origin of Livestock Rules must be finalized in an enforceable and meaningful way.
Another enforcement issue that must be addressed relates the transition of dairy cows into organic. OFPA requires organic milk and dairy products labeled as organic to come from dairy cows continuously managed as organic from the last third of gestation. However, in recognition of the short supply of organic dairy breeder stock in 1990 when the law was passed, an allowance was included for a one-time conversion of conventional dairy cows to organic as long as they are managed organically. Unfortunately, with two interpretations of this provision, it has turned into a loophole that has allowed some large dairy operations to circumvent the last third of gestation requirement all together, and to bring conventionally managed animals into their operations on a continuous basis. USDA proposed an Origin of Livestock rule to clarify that section of the law and ensure consistent enforcement of the standards. NOC is very disappointed the USDA has not yet finalized the rule.

Hydroponics
Contrary to a 2010 recommendation by the NOSB, NOP has been allowing hydroponic operations to be certified as organic, without clear standards, resulting in inconsistency and frustration between organic producers. Without clarity, standards are unable to be enforced consistently across certifiers, creating confusion in the organic marketplace and undermining the organic label. The NOSB should urge the NOP to halt the continued certification of hydroponic systems until specific regulations for these types of operations go through the NOSB recommendation process and are then adopted through the proposed and final rule process by the NOP.

Clarification of the 3-Year transition period must come from the NOP.
Despite the ongoing requests from the NOSB, NOC, certifiers, and other organic stakeholders for clarity, the NOP has not yet taken action to ensure that operations are held to a consistent standard regarding three-year transition requirements. This lack of consistency is egregious given that the varying interpretations have significant economic impacts for producers, as some operations are being required to undergo a three-year transition for a particular set of circumstances, while other operations in the exact same circumstances are allowed to forgo the three-year transition. We offer additional thoughts on how to address this issue in our comments on page 21.

A holistic approach is important.
From its very beginnings, the organic sector has been driven by an alliance of farmers, consumers, and members of industry who defined the organic standards as a holistic approach to protecting health and the environment, with a deep conviction that food production could operate in sync with nature and be mindful of its interrelationship with the natural world – protecting and enhancing the quality of air, water, land, and food.

Technology also plays a role in addressing enforcement challenges, and we appreciate the questions put forth in the published materials.

1. **How can technology efficiently and effectively be deployed to enhance supply chain traceability?**

We see the proposed Organic Link System (OLS), as one tool in the toolbox of fraud prevention. Additional layers to the existing Organic Integrity Database make sense to us and would offer a more centralized way for real-time communication if it were to be consistently utilized in the way the NOSB proposes. We also appreciate that the NOSB has attempted to remove the burden of interface with this system from the farmer, certifiers, and inspectors, and to place it more squarely on the shoulders of handlers by having the first documented exchange occur at the point-of-sale from the farmer to the buyer, with the buyer bearing the responsibility for recording the transaction. Further, we appreciate the recognition that an organic link system is a business-to-business look-back system, and therefore producers who sell directly to CSAs, direct sale to consumers, and farmer-to-farmer sales would be exempt.

In our discussion within NOC, we talked about Transfer Certificates (TCs). Because there seems to be some confusion regarding exactly what a TC system entails, we are providing an overview of our understanding: At the time of the annual inspection, the certifier, via the inspector, would gather information to calculate what is the possible volume of production for an operation. This information could be gathered in different ways, such as a desk audit based on acreage and organic yield baseline of a crop in the specific region. The farmer would then send an update to the certifier of what was actually harvested/produced, and the certifier would update the information. A "running tally" of inventory would be kept, and each time the certifier issued a transaction certificate for product sold, the amount sold would be deducted from the inventory. Once there was no more inventory, no additional transaction certificates would be issued. While we find this to be a very effective way to trace product, we realize that it is more burdensome to the farmer, certifier, and inspector.

2. **What form must an organic link system take to be non-burdensome for organic stakeholders, including certifiers, inspectors, handlers, operations, importers, etc.?**

A mobile app would make the most sense, as it would enable inspectors in the field, buyers at the mill, tech-savvy farmers in the field, and other handlers and certifiers working at computers to access the information on a computer screen or phone. The first sale by the farmer to the initial business buyer must be included in this system, and that part of the chain is trickier, given great diversity in access to and use of technology. For that reason, we agree with the NOSB suggestion to have the buyer bear the responsibility for recording this first transaction.

3. **What challenges exist with the implementation of an organic link system?**

Access to and use of technology is a primary concern. This idea works best where there is broadband internet and a smart phone or computer, but many producers do not have ready access to those tools. That said, it could still work. Perhaps there could be a phone-in option for sale reporting within a certain amount of time of the product leaving the farm gate, for example.

4. **Is there value in AMS, certifiers, and inspectors getting more granular with transaction-level detail to gain transparency throughout the complex supply chain?**

Yes, which is why transaction certificates and import certificates should and do exist. This is precisely why mass balance and traceback audits happen at inspection. The subcommittee makes the important point that we need key information regarding traceability and volume cataloged, and we need this to be readily accessible. We need the same sorts of accessible tools for yield data in all areas of the world where USDA organic products are grown.

Additionally, accurate operation-level organic acreage data that is segregated by crop would assist in conducting high-level, big picture mass balance audits, in addition to those performed during inspections, to determine if the output from a specific region matches production levels or is an indication of fraudulent activity.

Currently, certifiers report acreage data from certified operations to the USDA's Organic Integrity Database (OID), but that data is incomplete because reporting acreage data is not mandatory for certifiers and is not reported in a consistent way by all certifiers.

NOC believes the NOP should make product and acreage reporting mandatory for certifiers. We encourage a sound and sensible approach to ensure that for certifiers working with small, diversified producers, data can be captured in a reasonable way.

5. **What other methods exist for enhancing transparency?**

Please see our comments above regarding systemic issues within the USDA and NOP that continue to be the most challenging barriers to organic integrity. In addition, please see our comments on the CACS Work Agenda for additional suggestions to the CACS work agenda that would enhance transparency.

Harvest data and yield analysis: We are encouraged by the work being done on harvest data and yield analysis by agricultural economists as part of strategic initiatives at the NOP. We would like to hear more about this work and how the information is being used on an ongoing basis to assess risk and detect fraud. In addition, we would be interested in learning more about how this information is, or could be, shared with certifiers and inspectors.

Existing tools and parts of the certification process such as: Annual inspections and ongoing inspector training, unannounced inspections, residue sampling, good certifier communication, and information sharing. The Organic Integrity Database is valuable, and additional consistency is needed in the way certifiers list information on certificates and within that database.

Mapping Tools: Wild Farm Alliance has recently shared a number of mapping and remote imaging tools in the context of proposed requirements to prevent the conversion of Native Ecosystems to organic. These tools could be useful in detecting fraud.

Boots-on-the-ground: There is a need for more people at ports of exit and entry who understand the organic system and are tasked with upholding it. Ongoing collaboration with Customs and Border Protection and other relevant anti-fraud groups could aid in training and accountability in this arena. NOC applauds the NOP for securing clearance for an NOP employee to gain access to the Commercial Targeting and Analysis Center (CTAC).[23] This provides the NOP with access to additional information and resources to investigate violations of import and export laws.

HTS codes: Additional HTS codes are needed to provide more accurate data about volumes for organic imports. HTS is the "harmonized tariff schedule" – these codes are commonly used throughout the import and export process and provide a standardized numerical method of classifying traded products. This

[23] CTAC functions to facilitate information sharing and leverage the collective resources of participating government agencies to prevent, deter, interdict and investigate violations of U.S. import and export laws. https://www.cbp.gov/trade/priority-issues/import-safety/ctac

system is used by customs authorities around the world to identify products when assessing duties and taxes and for gathering statistics. We understand that the NOP has looked at high volume organic imports and has applied for additional HTS codes for those high-volume commodities for which codes do not yet exist. We encourage the NOSB to assess, with the NOP and organic stakeholders, if additional HTS codes are needed.

6. **Are there additional areas that need to be considered for improvement to prevent fraud or react to fraud?**

Yes; NOC recommends the following additional areas for consideration:

Storage and transport pest management requirements: In previous discussions related to transport, it has come to light that spraying for specific pests or invasive species occur during transport in some cases. It's unclear whether or not these practices are being taken into account in the organic certification process and could impact the organic status of bulk shipments.

Food and feed grade sales distinctions: As reported by our colleagues at the Ohio Ecological Food and Farm Association (OEFFA), there was a situation in which an OEFFA farmers intentionally sold grain into the feed grade market, and his buyer, a broker, subsequently sold the same grain as food grade. The grain technically could have been sold into the food grade market, so it did not present an organic integrity issue, but rather a fairness issue regarding pay price to the farmer. That said, had production practices been different and manure been applied on these fields closer to harvest, for instance, the switch could have been problematic on multiple levels, as the grain would then not be fit for food grade sales. If the grain grade or pay price is not tracked throughout a centralized system, this could be occurring far more often than any of us realize.

Additional regional yield data: We need additional organic and transitional yield research and data globally so that accurate expectations for commodity yields can be determined. In the meantime, efforts could be concentrated in regions of particular concern and those for which there is a history of fraud.

Trademark status for the USDA organic seal: The NOSB should examine if the NOP's plans to secure trademark status for the USDA organic seal will create new enforcement authorities and tools. It is our understanding that trademark status will create new legal authority and increases the threat of prison time for misuse of the label.

7. **Should the industry require land to be registered 36 months prior to certification.**

Many farmers do not know with certainty three years prior to certification that they are going to certify as organic. In recent years, with extreme weather events, a "prevent plant" year has often served as the impetus for organic transition. "Prevent plant" is a crop insurance term, indicating that a farmer could not plant due to extreme weather, and so claimed "prevent plant" on crop insurance forms. This often works as an impetus for transition, as the farmer mows the field rather than spraying, and is therefore already one year out from any prohibited substances being applied.

Fields that are rented or that change hands could often not be registered with that much notice, as the land manager changes over time. Additionally, land coming out of various conservation programs, or simply managed as a low- or no-input pasture or hay field may enter into organic certification as it comes out of such programs or management, but the decision to move in that direction is often not made a full

three years ahead of time. We maintain that farmers should have flexibility in the way they choose to manage their land.

On the other hand, we are aware of situations in which farmers have reported that land seemingly magically transitions in less than 36 months, and our current tools of self-reporting field history, or providing a Prior Land Use Statement, do lack rigor. One thought in response to this challenge involves inspections during the third year of transition.

Inspection tied to 3rd year of transition: A T3 inspection could aid in evaluating the condition of the field, soil, and ensure with eyes-on-the-ground that practices in the third year of transition are meeting the standards. This would require an early submission of an organic system plan, and would increase costs to producers, some of which could be offset through the recent transition funding that has become available at the federal level. On the positive side, this "early" inspection could help to meet first-year certification deadlines so that crops produced early in the first year the farm is eligible to certify would not be missed as organic sales due to the timing of the certification process.

CONCLUSION

NOC appreciates the CACS working to identify gaps that require further action to address enforcement challenges. While we appreciate the importance of the technological aspects of this work, the most challenging barriers to organic integrity continue to be systemic within the USDA and NOP.

Fraud – both within and outside of the United States – cannot be tolerated within the organic system. *All* fraud impacts all players in the trade.

Other

Clarity on 3-Year Transition Period

We appreciate our stakeholder representatives on the Board who continue to bring up challenging questions. During the spring 2021 meeting when asked about clarification of the three-year transition period, Dr. Tucker noted that she feels there is "tension between this overarching framework of the Organic Food Production Act and the nuance of site-specific conditions and site-specific decision making that every certifier has to do."[24] We would argue that lack of clarity from the NOP has caused this tension.

In August and September of 2020, the Accredited Certifiers Association, NOC, and Organic Farmers Association conducted a certifier survey to learn more about certifier practices regarding when a three-year transition is required after the application of a prohibited substance. The survey results demonstrate the high level of variation between certifiers in how they apply the three-year transition requirement in different situations. Our detailed comments summarizing the results of the survey from fall 2020 are available as Appendix D.

Despite the ongoing requests from the NOSB, NOC, certifiers, and other organic stakeholders for clarity, the NOP has not yet taken action to ensure that operations are held to a consistent standard regarding three-year transition requirements. NOC believes this lack of consistency is egregious given that the varying interpretations have significant economic impacts for producers, as some operations are being

[24] Transcript, Spring 2021 NOSB Meeting, p706.

required to undergo a three-year transition for a particular set of circumstances, while other operations in the exact same circumstances are allowed to forgo the three-year transition.

Dr. Tucker further stated that she is "worried that the three-year transition period is framed as a waiting period. Well actually it has to do with the application of prohibited substances."[25] We fully understand, and fully contend that this distinction has not been well-made by the NOP. We offer up the example of new poultry houses that are built on conventional land, with conventional land surrounding them, that are immediately certified organic because a certifier has allowed gravel to be brought in to cover the outdoor access area. There has been no consideration of the application of a prohibited substance. The NOP must make clear that this practice is not allowed under the three-year transition rule.

Dr. Tucker noted that she feels the "tension between a community and regulatory framework" occurs because some certifiers "have made a choice not to certify certain systems."[26] We applaud the certifiers that have made the choice not to certify systems without clear regulations or for systems that are clearly skirting the regulations.

Conclusion

As we've noted all along, our goal is to have the NOP clarify the requirement for a three-year transition for crop production in greenhouses and facilities ***after the application of a prohibited substance.*** **We call upon the NOSB to actively engage in this process by requesting a work agenda item, requesting stakeholder input, making recommendations to the NOP, and by asking the NOP to provide clarity so all certifiers and organic operations are held to the same standard.** The survey conducted by the Accredited Certifiers Association, NOC, and Organic Farmers Association provides a very good starting point for the types of questions that need to be addressed and the situations that remain unclear and should be clarified.

CACS Work Agenda

As recently as July 16, 2019, the CACS requested a Work Agenda item on the topic of inconsistencies between certifiers.[27] This is an urgent issue that is addressed many times over through NOSB meetings, within published materials, and has been addressed during discussions regarding the proposed rule on Strengthening Organic Enforcement. Inconsistencies between certifiers lead to "certifier shopping" and threaten the integrity of the organic label. NOC strongly encourages the CACS to pursue the Work Agenda item of inconsistencies between certifiers.

NOC is also requesting that the CACS:

- review and analyze NOP peer review audits;[28]
- track progress made by the Organic Imports Interagency Working Group;
- ask the NOP to explain its risk-based approach to accreditation;
- request more information about how funding increases are being used to strengthen the NOP's capacity to fight fraud and support the NOSB; and
- continue to identify gaps that require further action to address enforcement challenges.

[25] *Ibid,* p706.
[26] *Ibid,* p707.
[27] NOSB Executive Committee Meeting notes, Page 21 of 42, https://www.ams.usda.gov/sites/default/files/media/ESNotes2019Dec.pdf.
[28] https://www.ams.usda.gov/reports/peer-review-ams-national-organic-program

NOC appreciates the CACS working to identify gaps that require further action to address enforcement challenges, and we value the opportunity to comment on the discussion document on oversight improvements to deter fraud. We look forward to participating in future discussion on this topic.

Crops Subcommittee

Proposals

Chitosan – §205.601(j)(4) plant disease control – petitioned

While we find chitosan an interesting material that deserves consideration, there are areas of the petition that must be addressed first.

Chitosan is not in any of the categories of OFPA §6517(c)(1)(B)(i).
The 2020 petition and the Technical Review (TR)[29] state that chitosan is petitioned as a production aid. OFPA §6517(c)(1)(B)(i) allows a substance to be added to the National List if it "is used in production and contains an active synthetic ingredient in the following categories: copper and sulfur compounds; toxins derived from bacteria; pheromones, soaps, horticultural oils, fish emulsions, treated seed, vitamins and minerals; livestock parasiticides and medicines and production aids including netting, tree wraps and seals, insect traps, sticky barriers, row covers, and equipment cleansers." The term "production aids" is not defined, but is explained by example. As a fungicide/nematicide, chitosan cannot be considered as a production aid and is not eligible for inclusion on the National List for the petitioned use.

Efficacy must be considered as we evaluate the pros & the cons.
When considering chitosan and whether or not alternatives are currently available for use in organic production, not only did we consider that there are more than 200 products listed by OMRI for use as plant disease control,[30] but we considered the efficacy of those products, as well as the efficacy of chitosan. While there may be over 200 products listed by OMRI for use as plant disease control, we contend that there are not 200 effective products listed by OMRI for use as plant disease control.

Many of the studies that we reviewed noted that chitosan has been demonstrated to induce plant resistance, have antifungal and antibacterial properties, and stimulate growth of beneficial microbes; however, formulation, application rates, and crop-specific recommendations are still needed. It would appear that chitosan may be well suited to reduce disease and improve growth; however, more research is still needed to demonstrate its efficacy with specific crops and diseases and how its efficacy compares to the many alternatives.

One article noted:

> Chitosan is considered as the most abundant natural polymer with a dual effect: It controls pathogenic microorganisms by preventing growth, sporulation, spore viability, germination and disrupting cell and inducement of different defense responses in host plant inducing and/or inhibiting different biochemical activities during the plant-pathogen interaction. Chitosan has been

[29] Nexight Group, 2020. Technical Evaluation Report for Chitosan. Line 571.
[30] NOSB Proposals and Discussion Documents October 2021, Page 18 of 207, https://www.ams.usda.gov/sites/default/files/media/NOSBProposalsDDsOctober2021acc.pdf.

> assayed for control numerous pre- and post-harvest diseases of many crops. Chitosan also has the positive effect of enriching biodiversity in the rhizosphere.[31]

However, this same article went on to say:

> There are several issues associated with the commercial use of chitosan based pesticides that are still to be investigated. Like photosensitivity of chitosan derivatives (amorphous chitosan derivatives may absorb UV spectrum) has to be managed for its long lasting effectiveness. The effective concentration and application method of chitosan products is not defined yet. The biochemical mode of action of chitosan and oligochitosan for controlling plant diseases are still limited and unclear. So, much of study is still to be done in this field.[32]

It would appear that chitosan may be successful "in a number of ways to reduce disease levels and prevent the development of the spread of pathogen, thus preserving yield and quality,"[33] but here again, this good news is tempered with the warning that more research is needed:

> In an era of high demand for blemish-free food and high cost inputs, sustainable agriculture has only a slim margin to make profits while guaranteeing food supply to a growing population. The recourse to naturally-occurring products with interesting antimicrobial and eliciting properties such as chitin and chitosan and their derivatives has been getting more attention in recent years. These products can be used in a number of ways to reduce disease levels and prevent the development and spread of pathogen, thus preserving yield and quality. Interesting theoretical and applied findings were gathered in recent years and more are needed to examine the mechanisms governing the mode of action of these compounds pathosystem by pathosystem, when applied at large scales. Examination of better ways to incorporate these natural products into Integrated Pest Management strategies remains to be pursued in many major crops (i.e., potatoes, canola) especially against soilborne diseases.[34]

Another article notes that "in addition to its low cost production, chitosan also possesses other biological properties such as non-toxicity, biocompatibility and biodegradability, which make chitosan a sustainable and eco-friendly molecule."[35] This same article asserts that "chitosan could represent an innovative eco-friendly strategy for managing plant diseases and replacing copper or reducing its use, thanks to its several properties such as those previously described. In fact, several studies have demonstrated the effectiveness of chitosan in protecting plants from biotic stresses by direct and/or indirect actions." However, the same concerns previously noted are once again included here, "but its interaction with pathogens and plants are still not fully understood. Chitosan application in the field, including formulation aspects, is one of the least studied issues and it needs further testing and validation."[36]

Conclusion

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[31] Taha, S.H., I.M. El-Sherbiny, A.S. Salem, M. Abdel-Hamid, A.H. Hamed and G.A. Ahmed, 2019. Antiviral activity of curcumin loaded milk proteins nanoparticles on potato virus Y. Pak. J. Biol. Sci., 22: 614-622.

[32] *Ibid.*

[33] El Hadrami, Abdel & Adam, Lorne & Hadrami, Ismail & Daayf, Fouad. (2010). Chitosan in Plant Protection. Marine drugs. 8. 968-87. 10.3390/md8040968. https://www.researchgate.net/publication/44608931_Chitosan_in_Plant_Protection

[34] *Ibid.*

[35] Laura Orzali, Beatrice Corsi, Cinzia Forni and Luca Riccioni (January 11th 2017). Chitosan in Agriculture: A New Challenge for Managing Plant Disease, Biological Activities and Application of Marine Polysaccharides, Emad A. Shalaby, IntechOpen, DOI: 10.5772/66840. Available from: https://www.intechopen.com/chapters/53601

[36] *Ibid.*

Chitosan has been demonstrated to induce plant resistance, have antifungal and antibacterial properties, and stimulate growth of beneficial microbes; however, formulation, application rates, and crop-specific recommendations are still needed. It would appear that chitosan can be effective in reducing disease and improving growth; however, more research is still needed because different products vary in their efficacy and in the rates necessary. In addition, as petitioned, it does not fit into any of the OFPA categories at §6517(c)(1)(B)(i).

While a promising material, there is research yet to be done.

Biochar from manure – §205.602 – petitioned

In 2016, when the NOSB voted down another petition to annotate the prohibition of ash from manure burning, NOC made the following comments:

> NOC agrees with the Crops Subcommittee's determination that the petition to add an exception to the annotation for "Ash from manure burning" fails to meet the OFPA criteria. Therefore, NOC does not support the proposed annotation change.
>
> As noted by the Crops SC, ash from manure burning was originally placed on §205.602 based on its incompatibility with organic production. The Crops SC best demonstrates this in the notes from their discussion of the petition:
>
> *"Burning removes carbon and nitrogen from the final ash product and lessens its soil-building value. 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. The annotation amendment fails the OFPA criteria and should not be added to the National List."*[37]

We stand by these comments and agree with this rationale and believe that they apply to the current petition for ash from manure burning. The technical review (TR) gives a great deal of information about biochar from many different sources. While biochar has benefits, we believe that maintaining a clear prohibition on using products (ash or biochar) of burning (whether called "burning," "combustion," or "pyrolysis") manure supports organic principles.

In addition, we remind the NOSB of the backburner issue of contaminated inputs.[38] There is much yet to be learned about the contribution of manure from concentrated animal feeding operations (CAFOs) and industrial dairies to organic farms. Allowing biochar from these operations may increase the importation of contaminants from chemical-intensive practices.

Furthermore, the technical review covers many other issues, including these:

[37] https://www.ams.usda.gov/sites/default/files/media/CS%20Ash%20from%20Manure%20Burning%20NOP.pdf.
[38] Crops Subcommittee, 2015. Contaminated Input Plan, NOSB Spring 2015 meeting materials, pp. 135-141. https://www.ams.usda.gov/sites/default/files/media/meeting.pdf.

- "Biochar may contain toxic substances, depending on the feedstock and production conditions."[39] These include polycyclic aromatic hydrocarbons (PAHs), which have been classified as persistent carcinogens, and heavy metals.
- "There have been reports of bio-accumulated PAH in food crops that were grown in biochar-amended soils."[40]
- "Studies have shown that heavy metals are retained in the biochar, and their release into the environment is reduced due to the pyrolysis process. . . . However, while the immobilization of heavy metals in biochar soils appears to be a beneficial outcome, it may also result in the localized accumulation of pollutants over time. Furthermore, long-term retention in biochar is unknown."[41]
- "Biochar has the potential for environmental contamination at several stages."[42] This includes byproducts produced during production, carbon dioxide released during combustion, and PAHs and heavy metals in biochar released into the soil.
- "Given the irreversible nature of biochar application, there is no immediate means of remediation for biochar contaminated with PAHs or heavy metals once applied to the soil."[43]
- "There are many natural soil amendments that may be used in place of biochar. Alternative nutrient sources include the raw versions of several biochar feedstocks, such as amino acids, animal byproducts, crop remnants, wood products, compost, manures, and mulch."[44]
- "There are several alternatives to biochar to increase soil pH, including sodium carbonate, potassium bicarbonate, calcium acetate, calcium carbonate mineral sources, calcium hydroxide, and lime sulfur."[45]
- "Alternative practices that may make the use of biochar unnecessary include the application of a compost program and the application of manure. Compost and manure are natural sources of nutrients and contain chelating agents and microbes that produce natural compounds that help retain bioavailable soil nutrients. . . . Direct application of residual crops provides another alternative practice to biochar application. The direct application of crop remnants to agricultural soils has been reported to increase organic matter within soils and to improve water retention. Additionally, the reapplication of residual crops to fields rather than use as biochar feedstock prevents the loss of soil and existing nutrients and the acceleration of soil acidification following the removal process."[46]

To this point, we wholeheartedly support the comment of a NOC member who stated, "Manure is one of the best soil amendments and to waste it by turning it into ash is nonsensical." Manure on its own will build the soil, feed the soil, and aid in sequestering carbon. Turning it into ash from manure burning does not enhance these qualities.

Other biochar, other uses

The TR also addresses biochar originating from other sources. It is clear that biochar has potential benefits but may also pose hazards. All inputs into organic production pose hazards depending on the degree of

[39] Biochar Technical Review, 2021. Line 775.
[40] TR, Line 802.
[41] TR, lines 824-825, 834-836.
[42] TR, line 846.
[43] TR, lines 874-875.
[44] TR, lines 1082-1084.
[45] TR, lines 1112-1113.
[46] TR, lines 1135-1144.

contamination of the source. While we heartily support organic as a means of eliminating environmental contamination, we do not support it as a method of cleaning up contamination produced by chemical-intensive agriculture—unless the process is shown not to harm organic producers and consumers.

Conclusions
The NOSB should maintain a clear prohibition on using products (ash or biochar) of burning (whether called "burning," "combustion," or "pyrolysis") manure in organic production. This may require clarification of the language in the definitions section or in the annotation.

Ammonia Extract – §205.602 – petitioned

We thank the Crops Subcommittee (CS) for its thoughtful and thorough consideration of this petition and the comments that have been submitted on it. As stated in our previous in-depth comments, included as Appendix B, we support the prohibition of ammonia extracts. In addition, we support the approach of separate listings for stripped ammonia and concentrated ammonia, allowing for future listings if other technologies arise.

We also support adding to §205.203(f) a ceiling of 20% of crop needs on the use of nitrogen products with a C:N ratio of 3:1 or less. Highly soluble sources of nitrogen cannot be addressed in a vacuum, and we cannot look at one material at a time. We must take a broader approach to limiting highly soluble sources of nitrogen as a whole. To evaluate and list each individually, even with a restriction, is a slippery slope and raises the concern of "stacking." With this approach, producers could potentially "stack" highly soluble sources of nitrogen, using 20% of the crop's needs from Chilean nitrate, 20% of the crop's needs from another source, and 20% of the crop's needs from yet another source. Thus, none of the nitrogen for a crop would come from a fertilizer that feeds the soil.

We have also heard from our certifier members that they believe this approach of evaluating the C:N ratio of 3:1 or lower will be an easier approach for them to address, as well. They shared that they have been much more successful in getting the C:N ratio of a material than they have in trying to obtain other information regarding solubility or availability of sources of nitrogen.

NOC views these passing these three motions as imperative in our efforts to strengthen the role of organic as a climate change solution. We urge the NOSB to pass all three motions.

Sodium nitrate – §205.602 – petitioned by NOSB

Motion to reinstate the listing of sodium nitrate at 7 CFR 205.602(g) - prohibited nonsynthetic: Sodium nitrate - unless use is restricted to no more than 20 percent of the crop's total nitrogen requirement; use in spirulina production is unrestricted until October 21, 2005.

We concur with the Crop Subcommittee's statement of the problem concerning the listing of sodium nitrate:

> As part of the 2012 sunset review, the NOSB reviewed sodium nitrate at its April 2011, meeting and recommended that it be relisted, but without the annotation limiting its use. In other words, the NOSB voted to keep sodium nitrate on the National List with a complete prohibition on its use. During the rulemaking process, the NOP received comments about the economic significance

of complete prohibition, which delayed rulemaking. While that rulemaking was supposed to be forthcoming, it was never developed nor passed.

Currently the listing for sodium nitrate is in limbo. It was never renewed on the National List as a prohibited substance with or without the annotation limiting its use. While the wording remains on the National List, the listing is considered invalid. Therefore, sodium nitrate use is not restricted to 20% of a crop's total N needs since the listing was not renewed during the 2012 sunset process. It can also be argued that at this time sodium nitrate should not even appear on the National List since it was never officially renewed.

However, we are frustrated by the need for this discussion. This is a situation where we find ourselves spending time and energy on an issue that circumvents USDA's responsibility to advance long-standing NOSB recommendations. OFPA §6517(d)(2), which states that USDA may not permit the use of synthetic substances not approved by the NOSB, does not apply to sodium nitrate, a nonsynthetic substance. But §6517(d)(1), which says that the National List must be "based on" the recommendations of the NOSB, does apply.

The critical function of the NOSB asserting its statutory duty to review substances allowed and prohibited in organic production and processing is central to public trust in the organic label. Trust is in the marketplace is key to what has driven and continues to drive the growth of organic. While the NOSB cannot control a USDA that refuses to comply with the intent of the law and weakens NOSB positions by allowing substances that the Board has recommended prohibiting, the NOSB must continue to carry out its due diligence and reaffirm the importance of its positions.

We applaud the NOSB for taking this duty seriously and for following up on a substance that the USDA has clearly dropped the ball on. Every material on the National List must come up for sunset every five years; this one is not an exception.

Kasugamycin – for use as an approved active ingredient in organic cropproduction at 7 CFR §205.601 – petitioned

NOC opposes the listing of kasugamycin on the National List.
We support the subcommittee's unanimous decision to reject the petitioned substance. The reasons for rejecting the kasugamycin petition are the same as the reasons for eliminating streptomycin and tetracycline, and many will be repeated below.

The use of antibiotics is not compatible with organic production.
After reaching out to several fruit tree producers in the mid-west and west coast, we have learned that the fruit tree growers that we spoke to have not lost mature trees to fire blight since antibiotic use was taken off the NL. The producers we spoke with also noted that they would not support adding another antibiotic for this use to the NL. While some noted that it would be an easy fix, all agreed that it is not compatible with organic production.

Using antibiotics in organic production is contrary to consumer expectations, as antibiotics are touted throughout organic marketing as being prohibited. Despite the difficulty, organic livestock producers have been doing without antibiotics for almost two decades. Many of our trading partners around the world do not allow antibiotic use in organic production.

Antibiotic resistance poses a serious threat to human health, and use of antibiotics in agriculture contributes to that threat.

Given the important role that antibiotics play in world health, it is crucial for organic production to eliminate their use for the benefit of human health worldwide. As noted by Beyond Pesticides in their spring 2021 comments to the NOSB:

> "Now that we have learned what a pandemic looks and feels like, with the astounding levels of infection, hospitalization, and death from COVID-19, we must take serious steps to prevent another pandemic on the horizon—this one tied to bacterial resistance to antibiotics. An important article in *The Lancet*[47] points to a 'looming potential pandemic' resulting from a 'rise in multidrug-resistant bacterial infections that are undetected, underdiagnosed, and increasingly untreatable, [which] threatens the health of people in the USA and globally."[48]

Perhaps of even more immediate importance is the role kasugamycin plays in medical and veterinary uses.

> "Kasugamycin was tested and proven to be effective against *Pseudomonas aeruginosa* urinary infections in humans.[49] Kasugamycin targets an enzyme important in the pathogenesis of COVID-19.[50] Kasugamycin can reduce the development of resistance to the anti-tuberculosis drug rifampicin and may itself prove to be an effective drug itself in fighting tuberculosis.[51] It has been used for animal infections.[52] Although it is not essential to our argument that kasugamycin itself is of medical and veterinary importance, the need for effective antibiotics is an important reason for avoiding agricultural uses that can lead to resistance in potentially valuable antibiotics."[53]

The discussion document itself is quite damning, noting, "Normal labeled use of kasugamycin has led to field resistance in several pathogens,"[54] and "fire blight has grown resistant to every antibiotic used against it and there is good reason to believe it will become resistant to kasugamycin."[55]

Kasugamycin use is not necessary.

There are other ways to deal with fire blight.

> The alternative to kasugamycin is an integrated organic program that attacks fire blight at every point in its life cycle. Cultural controls can be combined with application of fixed copper sprays in

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[47] Strathdee, S.A., Davies, S.C. and Marcelin, J.R., 2020. Confronting antimicrobial resistance beyond the COVID-19 pandemic and the 2020 US election. *The Lancet*, *396*(10257), pp.1050-1053. https://www.thelancet.com/action/showPdf?pii=S0140-6736%2820%2932063-8.

[48] Terry Shistar. March 2021. Beyond Pesticides Comments on Kasugamycin. Page 1 of 9.

[49] https://pubchem.ncbi.nlm.nih.gov/compound/kasugamycin#section=Drug-and-Medication-Information.

[50] Kamle, S., Ma, B., He, C.H., Akosman, B., Zhou, Y., Lee, C.M., El-Deiry, W.S., Huntington, K., Liang, O., Machan, J. and Kang, M.J., Chitinase 3-like-1 is a Therapeutic Target That Mediates the Effects of Aging in COVID-19. *bioRxiv*, pp.2021-01.

[51] Chaudhuri, S., Li, L., Zimmerman, M., Chen, Y., Chen, Y.X., Toosky, M.N., Gardner, M., Pan, M., Li, Y.Y., Kawaji, Q. and Zhu, J.H., 2018. Kasugamycin potentiates rifampicin and limits emergence of resistance in Mycobacterium tuberculosis by specifically decreasing mycobacterial mistranslation. *Elife*, *7*, p.e36782.

[52] https://pubchem.ncbi.nlm.nih.gov/compound/kasugamycin#section=Drug-and-Medication-Information, citing Gerhartz, W. (exec ed.). Ullmann's Encyclopedia of Industrial Chemistry. 5th ed.Vol A1: Deerfield Beach, FL: VCH Publishers, 1985 to Present., p. V2: 523 (1985).

[53] Terry Shistar. March 2021. Beyond Pesticides Comments on Kasugamycin. Page 5 of 9.

[54] NOSB April 2021 proposals and discussion documents. Page 59 of 172.

[55] *Ibid.* Page 60 of 172.

> dormant and pre-bloom periods, application of lime sulfur for mildew control and thinning of apple blossoms, biological controls such as Blossom Protect during bloom time, and bio-control antagonists such as Serenade later in the blooming period.[56]

Organic apple and pear production has not ceased since the use of streptomycin and tetracycline were prohibited. While the alternatives may have some downsides, none are as serious as the use of antibiotics.

Conclusion
Kasugamycin does not meet any of the OFPA criteria for the National List—it poses health and environmental dangers, is not necessary, and is incompatible with organic practices.

Hydronium – §205.601 – petitioned

Hydronium is being petitioned for use as a processing aid for pH adjustment not below 5.0 and as a stabilizer in the production of animal manures. It would be used to reduce malodorous properties of manures.

NOC supports the subcommittee's unanimous vote to deny the petitioned request for hydronium. Our support is based on a flawed petition that is unclear as to what material is actually being petitioned.

We point to comments from Beyond Pesticides that detail the many flaws of the petition, including the fact that the petition describes a material that is not, in fact, hydronium based on the chemical definition. "This is not hydronium as it is generally known, and it is misleading to petition the substance under the name 'hydronium.'"[57]

When asked by the Crops Subcommittee (CS) to explain, the petitioner replied:

> The EXACT substance and common name for the chemistry being submitted is: Hydrogen(+1), triaqua-µ3-oxotri, sulfate (1:1), stabilized hydronium, or "Tydronium®" as the common, trademarked name. The ACS CAS No. is attached for your review as well as the copy of the issued US Patent from the USPTO describing the chemistry.

While the petition states that the CAS number is 2032207-39-7, the attached documentation (p. 36 of the petition) states that there is no registered CAS number, and that number is not found in the CAS database.[58] The patent was not attached to the petition as published on the NOP website. However, the patent as identified in the petition does exist, under the name "high molecular weight ionized water."[59]

Conclusion
It would be impossible to support adding a material to the National List based on a petition that is unclear as to exactly what material is being petitioned.

Carbon Dioxide – §205.601 – petitioned

[56] *Ibid.* Page 60 of 172.
[57] Terry Shistar. September 2021. Beyond Pesticides Comments on Hydronium. Page 1 of 3.
[58] https://webbook.nist.gov/cgi/cbook.cgi?ID=2032207-39-7&Units=SI.
[59] https://patents.google.com/patent/US7513987B1/en.

The NOSB received a petition requesting the addition of synthetic carbon dioxide at §205.601 Synthetic substances allowed for use in organic crop production as (a) algicide, disinfectants, and sanitizer, including irrigation system cleaning systems and (j) As plant or soil amendments.

To be clear, the petition for carbon dioxide to be added to §205.601 involves two different uses—as an acidifying agent in irrigation water in which the pH is high, and as "soil or plant amendments." The submitted documents concern use of CO_2 as a plant growth enhancer, whereas the subcommittee's published materials refer almost exclusively to the use as a pH adjuster in irrigation water, while not specifically addressing the use as a plant growth enhancer. Our comments will focus on CO_2 as a pH adjuster in irrigation water. We do not support the use of CO_2 as a plant growth enhancer. The proposed listing does not identify the use, as required by OFPA.

The petition and the subcommittee materials leave too many loopholes.
The CS says, "Carbon dioxide is a greenhouse gas and can contribute to climate change. Its increase in the atmosphere has altered the biodiversity in many ecosystems. However, the use of this product in accordance with the petition will not add to the increase of carbon dioxide. The petitioned use is for carbon dioxide produced as a byproduct of other processes. The carbon dioxide would be released to the atmosphere regardless of the petitioned use." However, **there is nothing in the petition that requires the use of CO_2 produced as a byproduct of other processes. If this is the intention of the CS, then it needs to be in an annotation.**

Carbon captured, or CO_2 as a byproduct of other processes, is not a climate change solution.
The petitioner appears to not be talking about carbon capture and storage (CCS), as noted here:

> However, carbon dioxide is produced from many sources in different ways. Long distance transport is not feasible in any form- gas, liquid or solid. Other than from the air and fermentation processes, this substance is obtained from mines and from oil and natural gas refining. These sources are considered synthetic. Because of substantial long-distance transport obstacles, this substance is not commercially available at many locations as a non-synthetic. Therefore, this petition is for synthetic carbon dioxide gas to be allowed in the acidification of water for the use in irrigation or to spray over the plant leaves.[60]

However, the petitioner cites Appendix A—the 2005 CCOF petition—for the manufacturer of CO_2, and all of the sources cited appear to be CCS and include: By-product of oil refinery operations, by-product of ethanol production, by-product of ammonia production, underground wells, and by-products of chemical synthesis.[61]

The use of CO_2 as a byproduct of other processes should be carefully considered.

> CCS [carbon capture and storage] and CCUS [carbon capture, utilization, and storage] refer to processes that collect or "capture" carbon dioxide generated by high-emitting activities — such as coal- and gas-fired power production or plastics manufacturing — and then transport those captured emissions to sites where they are either used for industrial processes or stored underground.

[60] Carbon dioxide petition, page 9 of 81.
[61] *Ibid,* page 12 of 81.

> CCS does not remove carbon from the atmosphere, although it is often erroneously conflated with "CO_2 removal" or "negative emission" technology. At best, CCS prevents some emissions caused by the combustion of carbon-based fuels from reaching the atmosphere — provided that the captured gases are not later released.
>
> In practice, however, CCS masks the harmful carbon emissions from the underlying source, enabling that source to continue operating rather than being replaced altogether, while creating additional risks, impacts, and costs associated with the CCS infrastructure itself.[62]

It should be noted that when this issue has been discussed during previous cycles, the point has been made that organic production should not rely on the byproducts of polluting industries. To do so is to accept polluting practices that organic has sought to end by assessing the impacts of allowed substances from cradle-to-grave—from production, and use, to disposal. Clearly, stated in the history of organic law and policy is the intent that organic systems "enhance" environmental protection and the complex biological communities that sustains life. To, in effect, incorporate a reliance on polluting practices runs contrary to the critical role that organic is playing and must play in incentivizing alternative non-polluting practices.

> CCS and CCUS are not only unnecessary, ineffective, uneconomic, and unsafe; the technologies are also exceptionally risky, prop up the fossil fuel industry and carbon-intensive industrial activities, and distract from the urgent task of transitioning away from fossil fuels at a time when the US and the world must dramatically accelerate that transition.[63]

CO_2 is not a production aid.
Once again, the need for the NOSB to develop a definition of "production aid" is clear. Currently, a "production aid" is defined in OFPA by example only. The examples given are "netting, tree wraps and seals, insect traps, sticky barriers, row covers, and equipment cleansers," and **CO_2 as an acidifying agent is not comparable to these materials. Therefore, it is not eligible for listing.**

The CS reasoning is erroneous.
The CS says, "Because carbon dioxide is approved as an organic processing substance, is already being produced, and its listing at §205.601 would be considered a recycling process, the Crops Subcommittee finds it compatible with a system of sustainable agriculture." First, National List materials must be listed for a specific use, and the fact that it meets the criteria for listing in processing food does not make it compatible with organic crop production. Second, as mentioned above, there is nothing in the petition or proposal that would require the use of recycled CO_2. Furthermore, by this reasoning, anything that is allowed in one production area—such as crops—would be allowed for handling and livestock and vice versa.

Conclusion
While CO_2 may be a good alternative for pH adjustment of irrigation water, documentation submitted by the petitioner and the CS proposal are inadequate to ensure that the listing would be used only to meet a need of organic producers, would not contribute to climate change, and would be compatible with organic production. Therefore, the petition should be rejected.

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[62] Why Carbon Capture Is Not a Climate Solution, Center for International Environmental Law, Page 11. https://www.ciel.org/wp-content/uploads/2021/07/Confronting-the-Myth-of-Carbon-Free-Fossil-Fuels.pdf
[63] *Ibid,* Page 2.

Lithothamnion – §205.601 – petitioned

In a memo, the National Organic Program (NOP) asks the NOSB to determine whether *Lithothamnion*, a genus of coralline marine red algae, can be certified organic.

NOP Policy Memo 12-1 states, "This policy memorandum is issued as a reminder that aquatic plants and their products may be certified under the current USDA organic regulations. Certifiers and their clients may use the USDA organic regulations, including the National List of Allowed and Prohibited Substances at 7 Code of Federal Regulations (CFR) 205.601-205.602, as the basis for the production and certification of cultured and wild crop harvested aquatic plants." Thus, it would appear that NOP has already decided that aquatic plants are eligible for certification.

However, as the Crops Subcommittee (CS) points out, the issue is not so clear. The CS reasons that because Lithothamnion is not a product of agriculture and is harvested as the dead skeletons of the algae, that it is nonagricultural. We would add that it also meets the definition of "nonagricultural" as cited by the CS because it is "extracted from, isolated from, or a fraction of an agricultural product [as determined by the NOP[64] so that the identity of the agricultural product is unrecognizable in the extract, isolate, or fraction."

The CS concludes, therefore, that since Lithothamnion is not agricultural and is not a wild crop that it cannot be certified organic. That is where the CS leaves the issue. But Lithothamnion is a marine material and, as such, deserves further consideration.

The conservation of marine materials used in organic production affects materials used in crop production, livestock production, and handling. The recommendation passed in Fall 2020 addresses marine algae used in crop production. Further action is needed on handling and livestock materials.

In its work on Marine Macroalgae in Crops Inputs, the Board convened an expert panel on marine materials at the Fall 2019 NOSB meeting, which included two scientists. A number of questions were addressed by the scientists, including (reply in *italics):*

> 6. Are there some species that are so important to ecosystem structure and function that harvest should not be permitted at all?
> a. *Coralline algae should be considered as off-limits to harvesting because of their life history characteristics and ecological importance.*

Coralline algae, including Lithothamnion, are marine red macroalgae whose cell walls are heavily impregnated with calcium carbonate, making them an important structural element of coral reefs. They form a crust covering the structure produced by coral animals, cementing it together and providing structural stability.[65,66] Crustose coralline algae, through their storage of calcium carbonate, provide a significant sink for carbon that has been calculated at potentially 1.6 ×109 tons of carbon per year.[67]

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[64] NOP Policy Memo 12-1.
[65] Bjork, M., Mohammed, S.M., Bjorklund, M. and Semesi, A., 1995. Coralline algae, important coral-reef builders threatened by pollution. *Ambio*, *24*(7-8), pp.502-505.
[66] MD Johnson, 2014. Coralline algae: the unsung architects of coral reefs. https://ocean.si.edu/ocean-life/plants-algae/coralline-algae-unsung-architects-coral-reefs.
[67] Van der Heijden, L.H. and Kamenos, N.A., 2015. Reviews and syntheses: Calculating the global contribution of coralline algae to total carbon burial. *Biogeosciences*, *12*(21), pp.6429-6441.

Unfortunately, coralline algae are at risk from multiple causes. Eutrophication can cause overgrowth of macroalgae that smother the reefs.[68] The climate crisis threatens the reefs through both acidification and warming.[69] Harvesting adds another threat,[70] something organic must not do. After all, the goal of organic, through continuous improvement, is to achieve agricultural production and processing systems and practices that are compatible with sustaining and enhancing the ecosystem on which life depends.

Conclusion
Use of products derived from Lithothamnion should be prohibited.

Biodegradable biobased mulch annotation change – §205.601

§205.601 Synthetic substances allowed for use in organic crop production.

(iii) **Biodegradable biobased mulch film as defined in §205.2. Must be produced without organisms or feedstock derived from excluded methods.**

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 at least 80% biobased with content determined using ASTM D6866 (incorporated by reference; see § 205.3).**

NOC acknowledges that a biodegradable biobased mulch (BDM) film would be a great asset to producers; however, we continue to harbor great concerns regarding the agronomic, environmental, and health effects of the breakdown and subsequent incorporation into the soil. We do not feel that these concerns have been addressed adequately at this time. Frankly, these concerns cannot be addressed adequately until further research is done in a more long-term manner.

We have expressed these concerns repeatedly in our written and oral comments and include our spring 2021 comments as Appendix E as a representation of our full concerns.

Continuous improvement is a cornerstone of organic production.
It would appear that the continuous improvement language has been dropped from the proposed wording as it appeared in the spring 2021 published materials:

> §205.601 Synthetic substances allowed for use in organic crop production.

[68] Bjork, M., Mohammed, S.M., Bjorklund, M. and Semesi, A., 1995. Coralline algae, important coral-reef builders threatened by pollution. *Ambio*, *24*(7-8), pp.502-505.
[6969] Diaz-Pulido, G., Anthony, K.R., Kline, D.I., Dove, S. and Hoegh-Guldberg, O., 2012. Interactions between ocean acidification and warming on the mortality and dissolution of coralline algae 1. *Journal of Phycology*, *48*(1), pp.32-39.
[70] EPA, 2021. Threats to coral reefs. https://www.epa.gov/coral-reefs/threats-coral-reefs.

(iii) Biodegradable biobased mulch film as defined in §205.2. Must be produced without organisms or feedstock derived from excluded methods. ***When 100% biobased biodegradable plastic films become available, producers are required to use 100% biobased content BDM plastic films.***

While it is incorporated into the body of the subcommittee materials published for the October 2021 meeting, "The CS recommends that use of >80% biobased material be required if and when these materials become available,"[71] it does not appear within the language for the suggested annotation change. As a cornerstone of organic production, continuous improvement must be addressed within the statutory language.

We have heard and understand the argument that just because a material has a higher biobased content, that does not mean it is highly biodegradable. In addition, the proposed language from the spring allows a large gap between 80% and 100% biobased materials that are not required for use.

We support comments that note that the term "commercially available" is already defined within the standard and therefore should be used. In addition, we suggest using the terminology "given that they are of the appropriate quality, quantity, and form," as this is terminology that is known to certifiers, inspectors, and producers when dealing with seed selection for use on organic operations. "Appropriate quality" would refer to the biodegradability issue, "quantity" refers to being able to purchase the amount needed, and "form" refers to the ability of the new material to perform the function of the old.

We suggest that an appropriate wording would be: ***When greater than 80% biobased biodegradable plastic films become commercially available, producers are required to use them, given that they are of the appropriate quality, quantity, and form.***

Conclusion
NOC acknowledges that a biodegradable biobased mulch film would be a great asset to producers; however, we harbor great concerns regarding the environmental and health effects of the breakdown. Almost every paper we read notes that additional research is required.

For almost every argument made for the use of biodegradable biobased mulch film, we could find a counter argument noting that more research is needed. We maintain that this product is "not ready for primetime." **The NOSB should vote no on this annotation change.**

Sunset

Copper Sulfate §205.601(a)(3) – For use as an algicide in aquatic rice systems, is limited to one application per field during any 24-month period. Application rates are limited to those which do not increase baseline soil test values for copper over a timeframe agreed upon by the producer and accredited certifying agent.

Copper Sulfate §205.601(e)(3) – For use as tadpole shrimp control in aquatic rice production, is limited to one application per field during any 24-month period. Application rates are limited to levels which do not increase baseline soil test values for copper over a timeframe agreed upon by the producer and accredited certifying agent.

[71] National Organic Standards Board, Proposals and Discussion Documents, October 2021, page 71 of 205.

NOC shares the concerns for copper sulfate used in organic aquatic rice systems outlined in the Crops Subcommittee published materials. We agree that it may be time to reconsider copper sulfate as an algicide and means of controlling tadpole shrimp in these production systems.

The CS indicates that "it appears there is sufficient evidence to conclude that:

1) use of copper sulfate in rice fields is environmentally detrimental,

2) alternative seeding practices could eliminate the need for the chemical as both algae and tadpole shrimp cease to be problematic once seedlings are established and

3) international standards do not allow for spraying of copper sulfate for organic rice production."[72]

While we wholeheartedly agree and point you in the direction of comments made by Beyond Pesticides that more fully explore the evidence in support of these points, there are additional considerations that have not been covered by the published materials.

If copper sulfate remains on the NL for use in rice fields, the use restrictions in the annotations need to be clarified.

This is supported by the comments received during the spring 2021 meeting. Comments were received noting that copper sulfate is used on rice fields anywhere from once per year to 1-2 times per season. Furthermore, during a conversation with a prominent rice grower, we were made aware of the advice he shares with other rice growers—specifically, since copper sulfate is on the National List for use in crop diseases and that listing does not carry the same restriction that the two listings for rice production carry, and since algae is "like scum" on the rice plants, growers should tell their certifiers they are applying copper sulfate for disease control and this is a way to "get around" the restrictions. While we appreciate his frank communication, we find this skirting of the regulations disconcerting. We are left wondering if this is a practice condoned by certifiers?

Since copper is an elemental product and cannot decompose, it can accumulate to toxic levels in the soil over time. In the long-run, and in the spirit of continuous improvement that remains at the core of OFPA, alternatives must be found to avoid the long-lasting adverse effects caused from the application of copper for disease control. Further, data on accumulation in the soil, as required by the annotation, should be provided to the CS and the public. What are the parameters used by certifiers to determine accumulation in the soil to toxic levels or concerns that soil is reaching this level?

In our spring 2021 comments, we noted that because the annotations on both listings for copper sulfate state, "Application rates are limited to those which do not increase baseline soil test values for copper over a timeframe agreed upon by the producer and accredited certifying agent," those who certify organic rice producers should be, therefore, obtaining test results for copper. Those test results should be requested by the CS and provided to the public—listings may remain anonymous—prior to the Fall 2021 meeting. It is our understanding from our conversations with rice growers that at least one large rice producer submitted soil test results for a prolonged period to the subcommittee, and we thank them for their transparency and openness.

[72] NOSB April 2021 proposals and discussion documents. Pages 28 & 29 of 172.

Drainage practices need to be better understood, with clearly defined parameters of what is/is not allowed in organic production.
Additionally, given that copper sulfate partitions mainly into water, and this listing is for an aquatic use, we have a concern that data on accumulation in the soil may not be the best measure of overuse in this instance. "Copper can be very toxic to fish and aquatic organisms, so care should be taken to apply sprays properly and avoid drift and run off." Imagine our horror when a prominent rice producer we were speaking with, when asked about where drainage water from rice fields goes from the drainage ditches, answered, "To the streams, to the Delta, to the ocean." While we understand from spring 2021 comments that some rice growers "employ the use of water return systems so that tail water from the rice fields throughout the season can be reclaimed and reused back to the fields with no run off to rivers or streams,"[73] it is clear that is not the case for all aquatic rice growers.

Copper sulfate in organic rice production as a Research Priority for 2021.
In 2012, copper sulfate in rice production was identified as a research priority, with specific questions addressing hazards to aquatic organisms, fate of copper materials, and alternative practices. It is clear that these concerns are as present today as they were in 2012. The CS concludes, "The Crops Subcommittee recommends re-listing copper sulfate and has called for a comprehensive review of copper sulfate as part of its Research Priorities for 2021." This comprehensive review of copper sulfate did not make it onto the list as reported by the Materials Subcommittee. In the interest of continuous improvement, it must be reinstated as a research priority.

However, given the concerns stated here and the conclusions of the CS cited above, it appears that calls for more research may only delay the inevitable. Copper sulfate should be removed from the National List for use in rice production.

Conclusion
Upon further investigation into this listing, we are left with more questions and concerns.

- Is the practice of "skirting" the regulations by claiming the disease control use in aquatic rice systems a common practice? If so, are certifiers aware of this practice, and what are they doing to address it?
- Drainage practices need to be better understood, with clearly defined parameters of what is/is not allowed in organic production.
- In the interest of continuous improvement, we strongly urge efforts to find an alternative method or material that would limit or end the use of copper sulfate in organic rice production. We support the CS recommendation for a "comprehensive review of copper sulfate" as a Research Priority.

Peracetic acid §205.601(a)(6) – For use in disinfecting equipment, seed, and asexually propagated planting material. Also permitted in hydrogen peroxide formulations as allowed in §205.601(a) at concentration of no more than 6% as indicated on the pesticide product label.
Peracetic acid §205.601(i)(8) – For use to control fire blight bacteria. Also permitted in hydrogen peroxide formulations as allowed in §205.601(i) at concentration of no more than 6% as indicated on the pesticide product label.

NOC supports the relisting of Peracetic Acid to the National List for all uses.

[73] NOSB Written Comments, Spring 2021, Aaron Scheidel 3 rd Generation California Rice Farmer, Scheidel Ranch.

As stated whenever a material in this class comes up, we feel that the NOSB could benefit from a review of sanitizers and disinfectants as a class, to aid the NOSB with future reviews of these items as they come before the board either as a new petition or at sunset. We appreciate the discussion at the spring 2021 NOSB meeting regarding a potential path forward and encourage work in this area.

Conclusion
NOC supports the relisting of Peracetic Acid to the National List for all uses. The NOSB and organic stakeholders would benefit from a review of sanitizers and disinfectants as a class.

EPA List 3 – inerts of unknown toxicity §205.601(m)(2) – For use only in passive pheromone dispensers.

The "inerts" listings on the NL remain an embarrassment to organic integrity, with the list of "inerts" that is referenced for review of products for organic certification was last updated in August 2004. The same issues are identified repeatedly every time "inerts" come up for sunset. In our Spring and Fall 2020 comments, NOC outlined a specific, succinct plan on how to move forward on List 4 "inerts" working with the Environmental Protection Agency's (EPA) Safer Choice Program. Those comments are included as Appendix F. The solution for List 3 "inerts" is even more specific and succinct—List 3 "inerts" should be delisted, with each individual material petitioned and reviewed to be added to the NL.

List 3 "inerts" should be delisted.
The NOSB has already recommended an expiration date for these chemicals.

In the spring 2012, the NOSB passed a motion to change the listing to:

> 2) Inert ingredients exempt from the requirement of a tolerance under 40 CFR 180.1122 that were formerly on EPA List 3 in passive polymeric dispenser products may be used until December 31, 2015, after which point they are subject to individual review under 205.601, unless already covered by a policy adopted by the NOP for all other inert ingredients.

The NOP refused to codify this recommendation. In doing so, we believe it is in violation of OFPA §6517(d)(2) "No additions. The Secretary may not include exemptions for the use of specific synthetic substances in the National List other than those exemptions contained in the Proposed National List or Proposed Amendments to the National List."

The identities of the former list 3 "inerts" are known, and they should be examined relative to OFPA criteria.
The CS proposal of spring 2012 identified the "inerts" formerly on List 3 that are covered by this listing and currently used in organic production. They are BHT (antioxidant), 2-Hydroxy-4-n-octyloxybenzophenone (UV absorber), and 2-(2-Hydroxy-3-tert-butyl-5-methylphenyl)-chlorobenzotriazole (UV stabilizer).[74] All three of these materials were petitioned to be added to the NL in 2002, with two of the materials having TRs. It would appear that much of the work had been done to begin the process of review.

During NOC's review process, we reached out to materials review experts at OMRI, WSDA, and PCO, who agreed that a resolution to this obsolete listing would be welcome. In addition to the three materials identified by the spring 2012 CS proposal, during our discussions with these review experts, it was made

[74] NOSB May 2012 proposals and discussion documents. Page 38 & 39 of 172.
https://www.ams.usda.gov/sites/default/files/media/packetnm.pdf

known that there may be a fourth "inert" in this category that is being used – benzaldehyde CAS #100-52-7. In looking at this fourth material, it immediately becomes apparent as to why these materials must be added to the NL for review. The EPA now classifies Benzaldehyde as approved for nonfood use and as a fragrance in nonfood uses. However, the FDA lists Benzaldehyde as GRAS for use as a flavoring agent or adjuvant. It is time for the NOSB to do their own review of these materials. As noted by Beyond Pesticides in their more thorough comments regarding these substances, "From our review of these chemicals, we think it quite likely that at least some will be found to be acceptable when reviewed by the NOSB."[75]

It is clear that List 3 "inerts of unknown toxicity" must be addressed. In 2016, there were 3 materials from this list that were being used – all of which were petitioned to be added to the NL. In 2021, we know that there are 4 materials from this list that are being used – 4 materials of "unknown toxicity" being used in organic production.

NOC encourages the NOSB to move forward in a way that provides a resolution to this obsolete listing. We encourage the NOSB to move forward boldly to address a listing that is an embarrassment to organic integrity by providing a timeline by which the currently used List 3 "inerts" must be petitioned and reviewed for addition to the National List.

Chlorine materials (i) Calcium hypochlorite. (ii) Chlorine dioxide. (iii) Hypochlorous acid - generated from electrolyzed water. (iv) Sodium hypochlorite §205.601(a)(2) – For pre-harvest use, residual chlorine levels in the water in direct crop contact or as water from cleaning irrigation systems applied to soil must not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act, except that chlorine products may be used in edible sprout production according to EPA label directions.

COMPREHENSIVE REVIEW OF SANITIZERS, DISINFECTANTS, AND STERILANTS

As NOC has repeatedly contended, the NOSB would benefit from a comprehensive review of sanitizers, disinfectants, and sterilants to inform decision-making when a new material is petitioned or a material is reviewed at sunset. As noted in previous comments on this topic, we recommend the TR for sodium dodecylbenzene sulfonate (SDBS) as a starting place because this TR asks and answers many of the questions that would be appropriate to address in a comprehensive review of sanitizers, disinfectants, and sterilants.

The NOSB could refer to the sanitation materials review to judge whether other materials currently on the National List meet the same need, or whether there is a special characteristic of the material under review that justifies its placement or renewal to the NL. This comprehensive review may help identify areas where there are gaps in necessary sanitizers or disinfectants which aid crops, livestock, and/or handling operations in promotion of organic food safety.

Request for a comprehensive review of sanitizers. OFPA requires that materials on the National List be itemized "by specific use or application." This requires the NOSB identify the uses for which these materials are needed. A Technical Review (TR) that establishes and distinguishes needs, uses, and relative toxicities for sanitizers, disinfectants, and sterilants must be performed. In particular, the TR must address the following:

- The uses for which these materials are needed;

[75] Terry Shistar. March 2021. Beyond Pesticides Comments on Crops Sunset Materials. Page 8 of 19.

- Whether an antimicrobial is the appropriate way to address the identified need;
- Whether any uses of specific materials in this class are required by law;
- Whether there are uses for which no material is listed on the National List;
- Whether organizations researching least toxic materials (e.g., EPA's Safer Choice/Design for the Environment program[76] and the Toxics Use Reduction Institute at the University of Massachusetts, Lowell[77]) have identified least toxic practices and materials that should be considered for use in organic production;
- Which alternative practices and materials might be proposed for each use that is identified; and
- The hazards to humans and the environment of the various options identified.

Conclusion
While this topic as a whole is daunting, we would suggest that the NOSB begin to address this one step at a time by requesting a TR to address the questions put forth in the spring 2021 published materials and every time a sanitizer, disinfectant, or sterilant comes up for petition or sunset review moving forward. We appreciate the discussion at the spring 2021 NOSB meeting regarding a potential path forward and encourage work in this area.

Calcium chloride §205.602(c) – Brine process is natural and prohibited for use except as a foliar spray to treat a physiological disorder associated with calcium uptake.

NOC supports relisting of Calcium Chloride, a prohibited nonsynthetic material with an annotation that allows the material to be used as a foliar spray to treat a physiological disorder associated with calcium uptake.

One important example of a physiological disorder that is known to be linked with an inability to take up sufficient calcium is bitter pit in apples.[78] This disorder is not limited to any particular variety of apples and is not limited to any particular production region—it is recognized as an abiotic disorder found in all areas of the world.[79] It appears that while fruit remains on the tree, bitter pit can generally be reduced by ensuring the plant's ability to take up calcium. However, in some cases, the corky, dark patches on the skin and flesh of the fruits associated with bitter pit do not become apparent until the apples are in storage, when the disorder is much more difficult to control and can results in extensive losses.

Conclusion
While we agree that the NOP regulations require producers to use all management practices available to manage soil nutrients, we recognize that the extent of physiological disorders present in any growing season depends on many factors, some of which are beyond the grower's control. We conclude that

[76] DfE for antimicrobials at https://www.epa.gov/pesticide-labels/design-environment-antimicrobial-pesticide-pilot-project-moving-toward-green-end. Safer Choice at https://www.epa.gov/saferchoice/safer-ingredients.
[77] https://www.turi.org/Our_Work/Cleaning_Laboratory.
[78] Apple: Bitter Pit, UC Davis Postharvest Technology website, 2016.
http://postharvest.ucdavis.edu/produce_information/Fruit_Physiological_Disorders/Apple_BitterPit/
"A mineral imbalance in the apple flesh develops with low levels of calcium and relatively high concentrations of potassium and magnesium. Low levels of calcium impair the selective permeability of cell membranes leading to cell injury and necrosis."

[79] Integrated Pest Management For Apples and Pears. University of California, Division of Agriculture and Natural Resources, Publication 3340, 1991. ISBN 0-931876-94-X, Library of Congress Catalog Card No. 91-65337.

calcium chloride is an important tool for managing problems with calcium uptake and is necessary to ensure production of market-quality crops.

Rotenone (CAS # 83-79-4) §205.602(f)

NOC supports the proposal to relist rotenone on §205.602, prohibited nonsynthetic materials. The Environmental Protection Agency's registration for rotenone was voluntarily cancelled for all uses except as a piscicide in 2006—and thus rotenone is not allowed in organic production in the United States. However, it continues to be allowed in other countries. Unless rotenone is relisted as a prohibited substance, organic farms in other countries will be able to use it for foods imported to the US and labeled organic. Organic agriculture had been widely criticized for using rotenone, which is associated with Parkinson's disease and other central nervous system damage in farmers and farmworkers.

Conclusion
NOC supports rotenone's continued listing at §205.602.

Handling Subcommittee

Proposals

Zein – §205.606 – petitioned

The NOSB has received a petition to list zein, a product of nonorganic corn protein, on §205.606 of the National List. New materials should not be added to §205.606. The organic industry has matured to the point that all agricultural materials can be produced organically. Listing on §205.606 only stifles organic production of new organic crops and promotes chemical-intensive production. Although the specific petitioned use is as a food coating, the petition identifies a number of uses for zein: as an ingredient and as a processing aid, including as a glaze, coating, taste masker, wheat gluten substitute, and for use in micro- or nano-encapsulation.

The Handling Subcommittee notes in the published materials that there are three main considerations:

> The potentially contentious areas for understanding zein's suitability for inclusion on the National List fall under three main categories: a) the environmental impacts of the corn wet-milling process used to create the corn gluten meal, b) whether the zein product can be considered non-synthetic and c) whether zein fills a unique functionality not already filled by currently allowed substances.

While we agree these three areas must be addressed, in our spring comments, we added a fourth—What is the barrier for organic production?

Before we delve into the considerations listed above, we will address several other concerns raised the subcommittee's published materials.

"While it would be possible to manufacture organic zein with organic starting products, the manufacturer states that sourcing certified organic corn gluten meal for the production of organic zein is

not currently possible."[80]
We find 30 listings for organic corn gluten meal in the Organic Integrity Database (OID). Given that there are currently 30 listings, we feel confident that should there be additional interest in organic corn gluten meal, manufacturing could be ramped up.

As per the published materials, there were no stakeholders in favor of adding Zein to the NL.
"Combining both written and oral stakeholder comments from the 2021 Spring Meeting, there were about ten total responses with ***none in favor*** of adding zein to the National List" (emphasis added).[81] Our question is why the subcommittee continued to pursue a material for addition to the NL that no stakeholders were in favor of adding? This speaks to our previous comments on the importance of minority opinions in the published materials to help inform stakeholders and allow for informed decision making. We would very much like to hear from those who voted "no" in subcommittee.

The NOP *does* have jurisdiction over how products are grown in Brazil.
In discussing alternative options to zein, the subcommittee materials note, "The final other option, carnauba wax, can be sourced and grown only in Brazil, making it outside of the US jurisdiction for regulating how its grown and produced."[82] This is incorrect. "As Brazil does not have an equivalency agreement with the NOP, all organic product there is grown to the NOP standards by NOP accredited certifiers, the most prominent of whom are OIA (Organización Internacional Agropecuaria) out of Argentina and IBD (Instituto Biodinamico) out of Brazil. Both are solid certifiers with good histories of compliance. I.e. in this case the NOP DOES have jurisdiction over how the product is grown in Brazil."[83]

The environmental impacts of the corn wet-milling process.
The published materials do a sufficient job of outlining the "legitimate concerns regarding the environmental impacts of the corn wet-milling process,"[84] while also noting:

> It is important to note that there does seem to be an effective pathway to avoiding the wet-milling process entirely in the production of zein. Researchers from the University of Illinois have developed another zein product that is created directly from whole corn. They plan to market this product under the name Amazein and point to the fact that direct production from corn bypasses need for sulfur dioxide or the other caustic chemicals that are used during the wet milling process that creates much of the corn gluten meal on the market. This method of direct extraction from whole organic corn may also allow for the creation of a truly organic zein product as organic ethanol [one of the raw materials used in the manufacturing process of zein] is available in the US, though perhaps prohibitively expensive.[85]

Cost is not a criterion for listing on the NL, so the fact that organic zein may be "prohibitively expensive" is not a reason for allowing zein as petitioned to be used in organic food. On the contrary, the difference in cost may be largely due to the ability to externalize the environmental and health costs of producing zein from nonorganic corn in the conventional manner.

[80] National Organic Standards Board Proposals and Discussion Documents, October 2021, page 106 of 205.
[81] *Ibid,* page 109 of 207.
[82] *Ibid,* page 110 of 205.
[83] Private email communications between Christie Badger and Garth Kahl, 9/28/21.
[84] NOSB April 2021 proposals and discussion documents Page 109 of 172.
[85] *Ibid.* Page 109 of 172.

There is no established precedent that zein is non-synthetic.
There is no established precedent that provides sufficient rationale that zein is non-synthetic. The discussion document notes that zein has never been petitioned to the NL previously, but "despite this, the rulings that have been made on corn steep liquor (CSL) are directly relevant to any review of zein as they are different products created during the same wet-milling process."[86]

The NOSB's vote on a motion to classify CSL as non-synthetic was 5 yes, 6 no, 1 abstention, 2 recusals, with no absences. This vote count did not meet the required 2/3's decisive vote required by law, but the NOP decided to regard CSL as non-synthetic, although a simple majority voted that CSL was synthetic.

To be perfectly clear, both the Organic Materials Review Institute (OMRI) and the NOSB voted that corn steep liquor is synthetic, as outlined in the published materials. Not only did OMRI have a decisive vote by their "Advisory Council, an independent body made up of experts in their fields," they had a decisive vote *twice.* Then, "In 2011, the NOSB reviewed corn steep liquor and through a similar rationale, came to the same conclusion."[87]

Perhaps the ruling by the NOP tried to establish a precedent; however, materials on the NL are subject to a decisive vote and recommendation by the NOSB, something the NOP never allowed to happen for CSL.

The HS proposal says, "As the NOSB has evaluated this question previously for corn steep liquor, the precedent has been established to consider these end products as non-synthetics." This is a misstatement. A simple majority of the board voted that CSL was synthetic. There was no decisive vote on classification.

Zein does not fill a unique functionality that is not already filled by currently allowed substances.
Both the TR and published materials do an excellent job at identifying alternative products "currently on the National List that can serve a similar role to zein in forming a protective coating around foodstuffs. Examples of this include beeswax, shellac, vegetable proteins and carnauba wax."[88] The Handling Subcommittee's published materials go on to indicate that "zein's functionality is unique because it offers a vegan/vegetarian option to replace shellac and beeswax as coatings."[89] However, we already have a wax on the list that serves this functionality in carnauba wax, which is taken from the leaves of the *Copernicia prunifera* palm tree.[90]

While we appreciate that the subcommittee again tried to identify a unique functionality of zein that is not already filled by currently allowed substances, hydrophobic properties are covered by carnauba wax. We have found nothing to indicate that zein is superior to carnauba wax for this functionality other than the "preference" noted in the subcommittee's materials.

Finally, with respect to carnauba wax, we already have an allowed non-organic input for this function listed at §205.606. As such, unless an operator can demonstrate that non-organic sources are not available in the type, quantity, and quality desired, they are required to use product from one of the 19 organic sources of carnauba wax listed in the OID.

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[86] *Ibid.* Page 108 of 172.
[87] *Ibid.* Page 106 of 172.
[88] *Ibid.* Page 110 of 172.
[89] *Ibid.* Page 110 of 172.
[90] Lisa Williams. July 5, 2019. "What Is Carnauba Wax And Is It Okay For Vegans To Use?" https://happyhappyvegan.com/carnauba-wax/.

What is the Barrier for Organic Production?
Every time a new material is petitioned to be added to §205.606, we find ourselves asking the question, "What is the barrier for producing these ingredients in organic form?" To address this issue, we offer our full comments from Spring 2020 as Appendix G, which includes a comprehensive list of questions that should be used when determining the barriers to organic production with new petitions to §606. In addition, these questions should be asked every time a material on §205.606 comes up for sunset review.

According to the information included in the published materials regarding the work being done at the University of Illinois, there does not appear to be one. The production method for the product they plan to manufacturer under the name Amazein is a "method of direct extraction from whole organic corn [that] may also allow for the creation of a truly organic zein product."[91] As noted above, cost is not a criterion for listing on the NL. In addition, NOC strongly takes issue with adding a material made from conventional corn to §205.606 when there is clearly organic corn readily available for use. Additionally, we challenge the probability of zein being made from GMO corn, and the ability of the NOP to ascertain that no GMO corn is used in production of the many products and inputs using corn in their manufacture.

If, against the recommendation of stakeholders, zein is listed, the NOSB must explicitly prohibit use for nano-encapsulation.
All substances on the NL must be listed "by specific use or application." Since one use of zein is nano-encapsulation[92] and the NOP has failed to codify the recommendation of the NOSB prohibiting engineered nanomaterials in organic products, the NOSB must make clear that zein may not be use in nano-encapsulation.

Conclusion
New materials should not be added to §205.606. The organic industry has matured to the point that all agricultural materials can be produced organically. Listing on §205.606 stifles organic production of new organic crops and promotes chemical-intensive production.

Zein does not fill a unique functionality that is not already filled by currently allowed substances.

Zein can be manufactured organically.

NOC strongly recommends that this petition be denied.

Fish Oil Annotation – §205.606 – Proposal

Fish oil annotation: §205.606 (e) Fish oil (Fatty acid CAS #'s: 10417-94-4, and 25167-62-8) - stabilized with organic ingredients or only with ingredients on the National List, §§205.605 and 205.606. ***Sourced from fishing industry by-product only and certified as sustainable against a third-party certification that is International Social and Environmental Accreditation and Labeling (ISEAL) Code Compliant or Global Seafood Sustainability Initiative (GSSI) recognized.***

[91] *Ibid.* Page 109 of 172.
[92] TR line 28.

As described by the HS, the work agenda item approved by the NOP is "to propose an annotation to fish oil to address environmental concerns."[93] NOC supports this work agenda item.

The Handling Subcommittee shares several concerns regarding reliance on third-party certification for a National List annotation, including:

1. Organic environmental sustainability standards would be sourced outside USDA and other U.S. government agencies;

2. There is potential for "greenwashing" if an unscrupulous third-party certifier did not meet environmental sustainability standards;

3. Requiring third-party certification could exclude smaller-scale producers that cannot afford third party certification even though their fishery meets sustainability standards.[94]

The concerns raised by the Handling Subcommittee are never addressed, but rather the published materials immediately launch into, "However, there are also advantages to relying on third-party certification programs…" The HS is remiss in glossing over these concerns.

Organic environmental sustainability standards would be sourced outside USDA and other U.S. government agencies.
Tying our standards to someone else's standard is always a risk. We may disagree with that standard in the future, and for this reason we strongly encourage a deep review at every sunset to ensure that the standard we are tying ours to continues to be acceptable to us. If it does not, the annotation will need to be changed, and this raises the question of how to do so in a timely manner given that annotations cannot be changed at sunset review.

Consideration should be given to a Memorandum of Understanding (MOU) stating that the NOSB will be kept informed of updates and improvements to the third-party standard. Without an MOU to ensure transparency and active engagement, we become passive in the enforcement of our own standards.

There is a potential for "greenwashing" if an unscrupulous third-party certifier did not meet environmental sustainability standards.
This, again, points to the need for an MOU and active engagement with the third-party standard bearer.

Requiring third-party certification could exclude smaller-scale producers that cannot afford third-party certification even though their fishery meets sustainability standards.
This is gravely concerning. More and more we are seeing smaller-scale producers pushed out of the organic market as big ag and industry recognize the price premiums to be had through the organic label. We are dismayed that the HS has recognized this as a concern but did not address it further.

Certifier application of third-party certification concerns.
We add a concern that we raised in our spring comments that has not been addressed. It is unclear how a certifier would apply the option put forth by the HS, which led us to respond in the negative in our spring comments to the question posed by the HS, "Are these requirements clear and enforceable?" This point is also relevant when we consider inconsistencies among certifiers. This is an urgent issue that is addressed many times over through NOSB meetings, within published materials, and has been addressed during discussions regarding the proposed rule on Strengthening Organic Enforcement. Inconsistencies between

[93] *Ibid.* Page 109 of 172.
[94] NOSB April 2021 proposals and discussion documents Page 113 of 172.

certifiers lead to "certifier shopping" and threaten the integrity of the organic label. Creating additional opportunities for inconsistencies among certifiers is unacceptable.

The use of fish oil in organic production and products must protect the marine ecosystem.
In crafting the three options for consideration presented in the spring 2021 published materials, the HS noted that the first element considered was "that fish oil should be sourced from fishing industry by-product only."[95] It is unclear to us what exactly this entails, and if it is unclear to us, we can imagine it is unclear to others. For this annotation change to move forward, the NOSB should make clear the exact definition of "by-product," and should clearly state that by-catch is not included as a part of by-product.

The Fall 2020 NOSB recommendation on wild, native fish for liquid fish products included the following definition:[96]

> *Bycatch.* Incidental or discarded catch that have low economic value, fish that must be discarded because of management regulations, or fish that are unintentionally killed by fishing gear (mortality).

In our Fall 2020 NOSB comments on this definition, we expressed our preference to have "bycatch" removed from the annotation. The definition of bycatch originally read "Incidental or discarded catch that have no economic value." At our suggestion, the word "no" was changed to the word "low."

Many fish that we now consider to be high value were bycatch at one time. In 1997, the Organization for Economic Co-operation and Development defined bycatch as "total fishing mortality, excluding that accounted directly by the retained catch of target species." They further noted that "bycatch contributes to fishery decline and is a mechanism to overfish unintentional catch" as people can hide behind the word "bycatch" to go in and decimate a population because it is not considered economically valuable.

The TR for fish-based fertilizers clearly states concerns for environmental impact: "Regardless of the intended use, harvesting wild, native fish can contribute to biodiversity loss, habitat destruction, and loss of ecosystem services."[97] Further, the TR states that when it comes to harvesting wild, native fish:

> "[T]heir population dynamics are not understood in many cases. It is also difficult to ascertain the effect of removing biomass, even from a sustainable fishery, considering that these species may be a food source for other species. Meal and oil fish can be critical to the function of entire ecosystems; for example, Pacific thread herring (Opisthonema libertate) and Pacific anchoveta (Cetengraulis mysticetus) are critical links in the Gulf of California, transferring energy through the food web and controlling the organization of these ecosystems."[98]

We believe this paragraph is important and speaks directly to the purpose of this work agenda item. Given that the importance of removing fish biomass is not well understood, either from the perspective of an energetic balance or from the perspective of food web dynamics, the organic industry should take a precautionary approach to protect marine ecosystems.

This is further supported by a 2014 fish stocks assessment report by FAO, which concluded that targeting pelagic species removes "one ecosystem component without considering cascading effects on the

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[95] *Ibid.* Page 112 of 172.
[96] Formal Recommendation from the NOSB to the NOP. October 30, 2020. Wild, Native Fish for Fertilizer Production. Page 2 of 2.
https://www.ams.usda.gov/sites/default/files/media/CSWildNativeFishLiquidFishProductsRec_webpost.pdf
[97] 2019 TR, Lines 327-328
[98] 2019 TR, Lines 342-349

dependent species."[99] It further warns that, "[c]oncerns about the impacts of harvest strategies that fail to consider trophic relationships in a given ecosystem have been recognized for decades, and abundant scientific literature exists underpinning its possible negative impacts on the structure and functioning of aquatic ecosystems."[100] Sardines, anchovies, and herring play a key ecological role in the survival of larger predatory fish, mammals, and seabirds. They serve as an important link in the transfer of food energy from plankton to larger species in the marine food web, some of which may be endangered.[101] Further exploitation is not an option, particularly for organic, because the unsustainable practice of allowing a non-essential fish-based ingredient in organic food to endanger the food supply of marine life is wholly incompatible with organic systems of production.

Restricting the species and location of the harvest is not sufficient; the method is also important.
A satisfactory annotation must address not only the sustainability of harvest from the fisheries, but also the health of the marine ecosystems. Restricting the species and location of the harvest is not sufficient. The method is also important. For example, trawling activity has been reported on 75% of the global continental shelf area[102] and is one of the "most significant forms of physical disturbance on the seabed."[103] "[T]he proportion of seabed area exposed to bottom trawling ranges from <1% to >80% in different regions of the world. Trawling may modify sediment texture (grain size), the presence and nature of bedforms and chemical exchange processes. Trawling can also have direct and indirect impacts on populations and communities of benthic invertebrates."[104]

Further, there should be good practices in place that do not destroy those predatory species that are so important to the ecosystem chain. "Bycatch refers to 'discarded catch of marine species and unobserved mortality due to a direct encounter with fishing vessels and gear.' These unintentionally caught animals often suffer injuries or die."[105] "Bycatch can be fish, but also includes other animals such as dolphins, whales, sea turtles, and seabirds that become hooked or entangled in fishing gear."[106] There are methods that minimize bycatch that are not always used.[107]

Conclusion
The use of fish oil in organic production and products must protect the marine ecosystem. Given that the importance of removing fish biomass is not well understood, either from the perspective of an energetic balance or from the perspective of food web dynamics, the organic industry should take a precautionary approach to protect marine ecosystems.

Restricting the species and location of the harvest is not sufficient; the method is also important and must be addressed. A satisfactory annotation must address not only the sustainability of harvest from the fisheries, but also the health of the marine ecosystems. There should be good practices in place that do not destroy those predatory species that are so important to the ecosystem chain.

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[99] FAO Fisheries and Aquaculture Department (2014), *supra* note 10, at 136.
[100] *Ibid.*
[101] *Ibid,* at 137.
[102] Luypaert T., Hagan J.G., McCarthy M.L., Poti M. (2020) Status of Marine Biodiversity in the Anthropocene. In: Jungblut S., Liebich V., Bode-Dalby M. (eds) YOUMARES 9 - The Oceans: Our Research, Our Future. Springer, Cham.
[103] Colloca, F., Scarcella, G. and Libralato, S., 2017. Recent trends and impacts of fisheries exploitation on Mediterranean stocks and ecosystems. *Frontiers in Marine Science*, *4*, p.244.
[104] Colloca, F., Scarcella, G. and Libralato, S., 2017. Recent trends and impacts of fisheries exploitation on Mediterranean stocks and ecosystems. *Frontiers in Marine Science*, *4*, p.244.
[105] NOAA Fisheries. *What is bycatch?* https://www.fisheries.noaa.gov/node/251
[106] *Ibid.*
[107] https://www.worldwildlife.org/threats/bycatch

The concerns raised in the published materials must be addressed.

Sunset

Agar-agar §205.605(a)

Synthetic vs. Nonsynthetic Agar

Agar (or agar-agar) may be nonsynthetic or synthetic. Nonsynthetic agar is made from *Gellidium* species of seaweed. It may be pretreated with an acid (vinegar or a mineral acid) to improve penetration. Synthetic agar is made from *Graciliara* species, which is subject to alkaline pretreatment to bring about a chemical change in the polysaccharides (L-galactose-6-sulfate groups are converted to 3,6-anhydro-L-galactose), producing agar with increased gel strength.

In the spring of 2016, the Handling Subcommittee (HS) concluded from the Technical Evaluation Report (TR) that a reevaluation of the classification of agar might be needed once the NOP finalizes the classification of materials guidance. That guidance is now considered final, though we believe it is flawed. The TR states:[108]

> 'Natural' agar refers to products sold in strips or squares that are produced on a small scale using traditional methods for extraction and freezing. First, the algae are boiled in water for several hours, sometimes in the presence of vinegar or dilute mineral acid. Then the extract is filtered through a cotton cloth and poured into wooden trays to cool. The resulting gel is cut into strips that are placed outside to freeze at night and thaw during the day, a process that may be repeated. Modern refrigeration is sometimes used as a substitute. Finally, the strips are dried and bleached in the sun. The agar-agar produced by this process has a weak gelling capacity and currently accounts for only ~1.5% of the world's production.
>
> However, nonsynthetic agar also may be made by syneresis, which is:[109]
> the separation of a liquid from a gel. During this process, mechanical pressure is applied to the agar-agar gels to increase the rate of separation. The polymer chains that make up agar-agar associate together and water is expressed from the gel. The resulting gels have an agar-agar concentration of about 20% making this method much more efficient than the freeze-thaw process.

The agar concentration from this process (20%) is about twice that of the gels made through the "natural" process (10-12%). The source for much of the information in the TR, McHugh (2003),[110] may be helpful to the committee in checking its conclusions. It is clear that agar made from *Gelidium* species is nonsynthetic, while agar made from *Gracilaria* species is synthetic, and the HS should determine whether there is adequate production of nonsynthetic agar to meet the needs of organic processors.

As agar is made from seaweed, this must be considered under the broader scope of marine materials.

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[108] Lines 202-209.

[109] TR lines 192-196.

[110] McHugh, D.J. 2003. Ch. 2 Seaweeds used as a source of agar and Ch. 3 Agar. In: McHugh, D.J. 2003. A Guide to the Seaweed Industry. FAO Technical Fisheries Paper No. 441. Food and Agricultural Organization of the United Nations, Rome, Italy. Available online at http://www.fao.org/docrep/006/y4765e/y4765e00.htm.

NOC greatly appreciates the work of several Board members over the past few years in building toward the NOSB's Fall 2020 recommendation on Marine Macroalgae. We strongly encourage the NOP to move forward on this recommendation.

The Fall 2020 NOSB recommendation is designed to protect marine ecosystems from damage from harvesting marine macroalgae. The NOSB recommended an annotation to listings of synthetic macroalgae products used in crop production:

> Prohibited harvest areas: established conservation areas under federal, state, or local ownership, public or private, including parks, preserves, sanctuaries, refuges, or areas identified as important or high value habitats at the state or federal level. Prohibited harvest methods: bottom trawling and harvest practices that prevent reproduction and diminish the regeneration of natural populations. Harvest practices should ensure that sufficient propagules, holdfasts, and reproductive structures are available to maintain the abundance and size structure of the population and its ecosystem functions. Harvest timing: repeat harvest is prohibited until biomass and architecture (density and height) of the targeted species approaches the biomass and architecture of undisturbed natural stands of the targeted species in that area. Bycatch: must be monitored and prevented, or eliminated in the case of special status species protected by U.S. Fish and Wildlife Service or National Marine Fisheries Service.[111]

In addition, "A new listing at 205.602 is further recommended to prohibit marine macroalgae unless harvested to the same parameters, with an exemption for non-commercial harvests."[112] These protections should also be applied to macroalgae used for organic food inputs.

The ecological impacts of the use of seaweed must be considered as part of the larger Marine Materials/Marine Macroalgae topic. The increased harvesting of seaweed leads to questions regarding sustainability and overharvesting. The organic regulations require that organic production utilize "practices that foster cycling of resources, promote ecological balance, and conserve biodiversity."[113] Consumers who choose organic foods expect this to be true from farm to fork, including the inputs used by organic farmers.

Conclusion
We support the continued listing of agar-agar on §205.605(a) Nonsynthetics allowed, with the annotation, "from *Gellidium* species, processed without alkaline pretreatment, harvested according to restrictions on marine macroalgae used in crop production."

Ensuring that marine plants and algae used in organic production are sourced in a manner that fosters resource cycling, promotes ecological balance, and conserves biodiversity is complicated, especially given the complex nature of marine ecosystems. Nevertheless, this endeavor is critical to organic integrity. Structures must be developed that ensure production of organic food is not indirectly contributing to the destruction of ocean habitats or depletion of marine resources.

The Fall 2020 NOSB recommendation on Marine Macroalgae is a strong start, and should continue to move forward.

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[111] NOSB. October 30, 2020. Formal Recommendation Marine Macroalgae in Crop Fertility Inputs. Page 1 of 3. https://www.ams.usda.gov/sites/default/files/media/MSMarineMaterialsRec_webpost.pdf
[112] *Ibid.* Page 1 of 3.
[113] 7 C.F.R. §205.2.

Animal enzymes §205.605(a)

Since animal enzymes are produced from nonorganic livestock, who have been fed nonorganic feeds, and could have been given GMO feeds, non-approved animal by-products, etc., our goal should be to obtain these enzymes from organic animals. While animal enzymes are mostly known as coagulants in making cheese, they are also used in other food products, such as a processing aids, and as digestive supplements. We encourage the NOSB to continue the search for organic animal enzymes, and if not available, to discover the barriers and how to overcome them.

One way to begin addressing obtaining animal enzymes from an organic source would be working with a pilot plant on a smaller scale that would help understand what kind of issues one might run into when sourcing this material as organic. Sourcing animal enzymes from organic animals would be an opportunity to use as much of the animal as possible in organic production and gain an organic price on the marketplace. We did find a source for organic all natural dry calf rennet powder and feel that if someone has done it, more production should be encouraged. As noted in the published materials, "The 2000 TAP for animal derived enzymes indicated that animal derived enzymes could be produced from organic livestock."[114]

Conclusion
Our goal should be to obtain these enzymes from organic animals. We encourage the NOSB to continue the search for organic animal enzymes, and if not available, to discover the barriers and how to overcome them.

Carrageenan §205.605(a)

NOC opposes relisting carrageenan on the National List. Our position on carrageenan has not changed since we commented for the 2012 sunset review. We continue to urge the NOSB to remove carrageenan from the National List.

We strongly support the Fall 2016 NOSB recommendation to remove carrageenan from the NL. As noted in the Board's recommendation memo to the NOP, "Because there was intense scrutiny about carrageenan, each OFPA criteria was reviewed carefully and all public comment was acknowledged."[115] Our comments will focus on the review of the OFPA criteria at 7 CFR 6518(m), as the Board's did during their last review.

During the spring 2021 meeting, several NOSB members expressed their concern that the current NOSB is discussing something that a former Board made a solid, unanimous decision on. They further noted that unless there is significant new material to be addressed, the fall 2016 NOSB recommendation to delist should be respected. We could not agree more. Why are we asking the NOSB and organic stakeholders to spend time and energy on developing new recommendations that circumvent the USDA's responsibility to advance long-standing NOSB recommendations?

The production of carrageenan results in adverse ecological impacts.

[114] NOSB April 2021 proposals and discussion documents Page 73 of 172.
[115] Sunset 2018 Review Summary. NOSB Final Review. Handling Substances §205.605(a), §205.605(b), §205.606. November 2016. Page 4 of 9.

> 7 CFR 6518(m)(3) The probability of environmental contamination during manufacture, use, misuse, or disposal of such substance; there may be negative impacts on the environment from harvesting wild seaweed. Indications are that most of this species of seaweed is now farmed, and some farming methods are more sustainable and ecologically sound than others. It appears that it might be possible for the seaweed to be farmed organically, and this might improve the environmental footprint. Additionally, there are several ways to manufacture the carrageenan from seaweed. Some of these would result in a non-synthetic version, while at least one method might be considered a synthetic extraction.[116]

The ecological impacts of the use of seaweed must be considered as part of the larger Marine Materials/Marine Macroalgae topic. The increased harvesting of seaweed leads to questions regarding sustainability and overharvesting. The organic regulations require that organic production utilize "practices that foster cycling of resources, promote ecological balance, and conserve biodiversity."[117] Consumers who choose organic foods expect this to be true from farm to fork, including the inputs used by organic farmers.

Ensuring that marine plants and algae used in organic production are sourced in a manner that fosters resource cycling, promotes ecological balance, and conserves biodiversity is complicated, especially given the complex nature of marine ecosystems. Nevertheless, this endeavor is critical to organic integrity. Structures must be developed that ensure production of organic food is not indirectly contributing to the destruction of ocean habitats or depletion of marine resources.

Carrageenan may have adverse effects on the health of consumers.

> (4) The effect of the substance on human health; The research indicating that there may be negative health effects on all humans in terms of inflammation, glucose intolerance, or tumors does not seem to be replicated in the large body of scientific literature. There are many anecdotal reports of sensitivity to carrageenan in foods from individuals in public comments. These concerns have not been studied in the literature, however they are acknowledged. This was not seen as a primary reason to remove carrageenan since it is listed on the labels as a food ingredient.[118]

Degraded carrageenan is a List 2B carcinogen according to the World Health Organization's International Agency for Research on Cancer (IARC).[119] Research, including industry-sponsored research, suggests that consuming foods with food-grade carrageenan exposes consumers to degraded carrageenan.[120] After a discussion of the impacts of "degraded carrageenan," the 2011 TR continues,

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[116] *Ibid.* Page 4 of 9.

[117] 7 C.F.R. §205.2.

[118] Sunset 2018 Review Summary. NOSB Final Review. Handling Substances §205.605(a), §205.605(b), §205.606. November 2016. Page 4 of 9.

[119] International Agency for Research on Cancer (IARC), Agents Classified by the IARC Monographs, Volumes 1-110. http://monographs.iarc.fr/ENG/Classification/ClassificationsGroupOrder.pdf

[120] Marinalg International, "Status Report on the work of Marinalg International to measure the molecular weight distribution of carrageenan and PES in order to meet the EU specification: less than 5% below 50,000 daltons."

Capron I, Yvon M and Muller G (1996) In-vitro gastric stability of carrageenan. Food Hydrocolloids 10(2): 239-244
Ekström, L.G. (1985) Molecular-weight-distribution and the behaviour of kappa-carrageenan on hydrolysis. Part II. Carbohydrate Research 135: 283-289
Ekström L.G. and Kuivinen J (1983) Molecular weight distribution and hydrolysis behaviour of carrageenans. Carbohydrate Research 116: 89-94

> Today, both concern and debate exists over human health hazards from not only direct use of degraded carrageenan in foods, but also based on the idea that acid hydrolysis in the stomach following consumption of non-degraded carrageenan could result in formation of degraded carrageenan, which could then potentially promote colon cancer (Tobacman, 2001; Carthew, 2002).[121]

The more recent (2015) technical review specifically examined potential health impacts of carrageenan. On the question of whether less hazardous high molecular weight carrageenan can be degraded in the digestive system to more hazardous lower molecular weight forms: "The research is not fully conclusive but seems to suggest that degradation is possible."[122] More research is needed to determine the extent to which degraded carrageenan occurs in the food supply, and the extent to which food-grade carrageenan degrades in the acidic environment of the digestive system.

NOC urges the NOSB to use the Precautionary Principle in its review of carrageenan. When scientific evidence points to potential harm, and no consensus has been reached between independent scientists and industry-funded scientists, we should act with caution and in the interest of public health. Carrageenan has not been proven to be safe, given the scientific data pointing to harm, and the burden of proof should not fall on the people who buy foods with carrageenan.

Is the substance essential for organic production?

> (6) The alternatives to using the substance in terms of practices or other available materials; an extensive list was prepared of all the food product categories in which carrageenan is used. In most of the product types there are versions that are currently being sold that do not contain carrageenan. These often contain other types of gums such as gellan, guar, or xanthan. Products for vegetarians where carrageenan is used in place of gelatin will be the most difficult to produce without it, but the majority of NOSB members were not concerned about this class of products being impacted.[123]

Carrageenan has no nutritional value; rather, food processors add carrageenan as a stabilizer and to change the texture, structure, and physical appearance of foods, such as dairy foods, plant-based beverages, and lunchmeats. As noted during the NOSB discussion at the November 2016 meeting, carrageenan fails the essentiality criterion.

Carrageenan is not essential for the production of organic food. Alternatives to carrageenan include other gums on the National List, a "Shake Well" label on the product package, or in some cases, like whipping cream, the alternative to carrageenan is nothing at all.

In 2012, it was already apparent that carrageenan is not an essential ingredient. For every organic product that contains carrageenan, another organic product by a different processor can be found on store shelves without it (the exception may be ready-to-eat infant formula). As public awareness of the potential human health effects of carrageenan has grown over the years, consumer demand has led many companies to remove carrageenan from their products. Even products that companies claimed in 2012 could not be made without it, like aseptic chocolate milk, are now made without carrageenan even by the largest processors.

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[121] Lines 571-582.
[122] Lines 40-41.
[123] Sunset 2018 Review Summary. NOSB Final Review. Handling Substances §205.605(a), §205.605(b), §205.606. November 2016. Page 4 of 9.

Unfortunately, some processors still make organic foods with carrageenan despite the wide availability of carrageenan-free alternatives. This places consumers in a bind, for example, when organic whipping cream with carrageenan appears in the store next to a conventional whipping cream product with cream as its only ingredient. We urge the NOSB to consider the impacts on consumer trust and organic farmers when non-essential ingredients like carrageenan appear in organic foods.

Carrageenan is incompatible with a system of sustainable agriculture.

> (7) Its compatibility with a system of sustainable agriculture; A majority of NOSB members believed that this ingredient is not compatible with sustainable agriculture because it is so controversial and they wanted to invoke the Precautionary Principle. Also invoked were the NOSB Guidance on Compatibility from the Appendix of the NOSB Policy and Procedures Manual that poses this factor (out of 12) for consideration, "Does the substance satisfy expectations of organic consumers regarding the authenticity and integrity of organic products"?[124]

We point you to our above comments. We agree that this ingredient is not compatible with sustainable agriculture and encourage you to invoke the Precautionary Principle. Carrageenan does not satisfy expectations of the organic consumer regarding the authenticity and integrity of organic products.

Further, Carrageenan is an unnecessary synthetic material. Volatile synthetic solvents are used in at least some of its manufacturing processes.[125] Depending on the production method, it may contain residues of other synthetic materials including polysorbate 80 and epichlorohydrin.[126] In some cases, it is used as a preservative.[127]

NOSB recommendation from November 2016 to remove carrageenan from the National List.
On January 17, 2018, the NOP published a proposed rule to amend the NL that would implement 29 NOSB recommendations beginning as far back as 2000. This proposal left out a critical recommendation: to remove carrageenan from §205.605(a) of the National List. The NOSB recommended removal of carrageenan from the National List at its November 2016 meeting.

While the NOP is not legally required to take a nonsynthetic material off the NL based on an NOSB recommendation, the NOP is required to base the National List on NOSB recommendations. We are alarmed and disappointed when we have consensus within the NOSB and the NOP does not follow through with that recommendation. We expect a greater level of transparency and justification when the NOP does not follow an NOSB recommendation to remove a NL item.

Conclusion
Carrageenan is incompatible with a system of sustainable agriculture.

The production of carrageenan results in adverse ecological impacts. NOC greatly appreciates the work of several Board members over the past few years in building toward the NOSB's Fall 2020 recommendation on Marine Macroalgae. We strongly encourage the NOP to move forward on this recommendation. With the 2020 recommendation as the foundation, we encourage the Board to continue work in this vein.

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[124] *Ibid.* Pages 4 & 5 of 9.
[125] 2011 TR lines 287-294.
[126] TAP review pages 3, 4, 7.
[127] 2011 TR line 415.

Carrageenan is not necessary–organic processors have been moving away from the use of carrageen due to consumer pressure since it was last considered for sunset.

NOC supports the NOSB recommendation from November 2016 to remove carrageenan from the National List. NOC opposes relisting carrageenan on the National List. Our position on carrageenan has not changed since we commented for the 2012 sunset review. We continue to urge the NOSB to stand firm on the 2016 recommendation and vote to remove carrageenan from the National List.

Glucono delta-lactone §205.605(a) – Production by the oxidation of D-glucose with bromine water is prohibited.

The current annotation –"production by the oxidation of D-glucose with bromine water is prohibited"—was added to ensure that glucono delta-lactone would be produced by microbial or enzymatic processes and hence be nonsynthetic. However, the 2016 technical review (TR) states, "There are many chemical methods of gluconic acid synthesis other than bromine water." Hence, the current annotation is not sufficient to ensure that the glucono delta-lactone (GDL) in use in organic processing is nonsynthetic.[128] It also states that some enzymes used in the production of GDL may be genetically engineered.

Conclusion
The NOSB should not relist GDL without an annotation change to correct these classification issues.

Tartaric acid §205.605(a) – Made from grape wine.

As listed on the National List, tartaric acid must be made from grape wine. The evaluation of tartaric acid must thus take into consideration the use of pesticides in the non-organic production of grapes and the availability of organic grape wine for this purpose, as well as the potential availability of the tartaric acid from organic grape wine if the demand existed.

In preparing our comments, NOC reached out to Phil LaRocca of LaRocca Vineyards, a certified organic operation in business since 1984. During our discussion, we asked Phil if there was any reason that tartaric acid could not be made from organic wine, to which he immediately replied, "Absolutely not." While we realize that given the number of wineries using tartaric acid, it would take time for manufacturers to develop an organic version at the necessary scale, we are also aware that this market will never emerge as long as tartaric acid is listed at §205.605(a) on the NL. (Organic hops anyone?) We acknowledge that delisting without sufficient notice would negatively affect those who use this material. Therefore, we suggest an expiration date to allow sufficient time for organic production to ramp up.

Conclusion
The HS should investigate whether tartaric acid from organic grape wine is available or could be available. Since tartaric acid is a waste product from winemaking, its sale could provide additional revenue to organic vintners. The current listing discourages the development of organic tartaric acid as there is no incentive to do so as long as non-organic tartaric acid can be used in organic wines.

[128] Lines 281-287.

Chlorine materials §205.605(b) – Disinfecting and sanitizing food contact surfaces, *Except,* That, residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act. (i) Calcium hypochlorite. (ii) Chlorine dioxide. (iii) Hypochlorous acid—generated from electrolyzed water. (iv) Sodium hypochlorite

COMPREHENSIVE REVIEW OF SANITIZERS, DISINFECTANTS, AND STERILANTS

As NOC has repeatedly contended, the NOSB would benefit from a comprehensive review of sanitizers, disinfectants, and sterilants to inform decision-making when a new material is petitioned or a material is reviewed at sunset. As noted in previous comments on this topic, we recommend the TR for sodium dodecylbenzene sulfonate (SDBS) as a starting place because this TR asks and answers many of the questions that would be appropriate to address in a comprehensive review of sanitizers, disinfectants, and sterilants.

The NOSB could refer to the sanitation materials review to judge whether other materials currently on the National List meet the same need, or whether there is a special characteristic of the material under review that justifies its placement or renewal to the NL. This comprehensive review may help identify areas where there are gaps in necessary sanitizers or disinfectants which aid crops, livestock, and/or handling operations in promotion of organic food safety.

Request for a comprehensive review of sanitizers. OFPA requires that materials on the National List be itemized "by specific use or application." This requires the NOSB identify the uses for which these materials are needed. A Technical Review (TR) that establishes and distinguishes needs, uses, and relative toxicities for sanitizers, disinfectants, and sterilants must be performed. In particular, the TR must address the following:

- The uses for which these materials are needed;
- Whether an antimicrobial is the appropriate way to address the identified need;
- Whether any uses of specific materials in this class are required by law;
- Whether there are uses for which no material is listed on the National List;
- Whether organizations researching least toxic materials (e.g., EPA's Safer Choice/Design for the Environment program[129] and the Toxics Use Reduction Institute at the University of Massachusetts, Lowell[130]) have identified least toxic practices and materials that should be considered for use in organic production;
- Which alternative practices and materials might be proposed for each use that is identified; and
- The hazards to humans and the environment of the various options identified.

Conclusion

While this topic as a whole is daunting, we would suggest that the NOSB begin to address this one step at a time by requesting a TR to address the questions put forth in the spring 2021 published materials and every time a sanitizer, disinfectant, or sterilant comes up for petition or sunset review moving forward. We appreciate the discussion at the spring 2021 NOSB meeting regarding a potential path forward and encourage work in this area.

[129] DfE for antimicrobials at https://www.epa.gov/pesticide-labels/design-environment-antimicrobial-pesticide-pilot-project-moving-toward-green-end. Safer Choice at https://www.epa.gov/saferchoice/safer-ingredients.
[130] https://www.turi.org/Our_Work/Cleaning_Laboratory.

Potassium hydroxide §205.605(b) – Prohibited for use in lye peeling of fruits and vegetables except when used for peeling peaches.

OFPA states, "The [National List] shall contain an itemization, by specific use or application, of each synthetic substance permitted under subsection (c)(1) or each natural substance prohibited under subsection (c)(2)." The annotation of potassium hydroxide (as well as that of sodium hydroxide) presents problems for review in that it specifies uses that *are not* allowed rather than those that *are* allowed. Identification of the uses is not only required by law, it is also essential for the NOSB review of the substance. However, framing an annotation in the negative creates an open-ended set of allowable uses instead of a closed list of the permitted uses or applications. Therefore, we urge the NOSB to examine the uses of potassium hydroxide in organic processing and propose a revised annotation that reflects those uses.

Are there adverse impacts on humans or the environment?
Severe adverse impacts of potassium hydroxide (lye) have been identified by both the 2001 technical advisory panel (TAP) review and the 2016 technical review (TR). The health hazards are derived from lye's high corrosivity, which can result in severe burns to eyes, skin, and mucous membranes.[131] The TAP review points out environmental concerns due to the disposal of large volumes of water with soluble potassium and alkali ions.[132] Mercury cells are used to produce most of the KOH in the United States.[133,134]

Is potassium hydroxide essential for organic processing?
The 2016 Technical Review (TR) identifies a number of food processing uses of potassium hydroxide:[135]

> Uses of potassium hydroxide that are Generally Recognized As Safe (GRAS) by the U.S. Food and Drug Administration (FDA) include use as a formulation aid, pH control agent, processing aid, stabilizer and thickener [21 CFR 184.1631(b)].

Potassium hydroxide's main food processing uses include use as a pH adjuster, cleaning agent, stabilizer, thickener, fruit and vegetable peeling agent, and poultry scald agent. It is used in dairy products, baked goods, cocoa, fruits, vegetables, soft drinks and poultry. The main foods processed with potassium hydroxide are chicken, cocoa, coloring agents, ice cream and black olives.

Soft soap is manufactured with potassium hydroxide.

Is potassium hydroxide used for all these purposes in organic processing? Is it necessary?
The TR and TAP review mostly addressed the use for peeling fruits and vegetables for canning or freezing. Although the annotation restricts this use to peaches, the handling subcommittee notes say, "A member added that it is used extensively and is also used for nectarines."[136] The essentiality of lye for canning or freezing peaches is still unclear. Most home canning and freezing uses hot water treatment,[137] and although heat in a certain range is avoided in commercial preparation using potassium hydroxide, steam

[131] Lines 118-122.
[132] Lines 165-166.
[133] Lines 185-186.
[134] Lines 369-374.
[135] Lines 52-61.
[136] HS notes for January 19, 2016.
[137] https://extension.purdue.edu/extmedia/HHS/HHS-808-W.pdf

treatment is a possibility for peeling peaches commercially.[138] TAP Reviewer #3 said, "Suitable equipment exists to remove the peels and pits by mechanical means."[139]

Is potassium hydroxide compatible with organic processing?
It is impossible to judge the compatibility of potassium hydroxide without knowing its uses. The 2001 TAP review was equivocal regarding the peeling of peaches, citing the incompatibility of using a synthetic substance to perform a mechanical function such as peeling as opposed the greater availability of an organic product.[140]

Conclusion
Potassium hydroxide is a hazardous material, possibly (with sodium hydroxide) one of the most hazardous and toxic on the National List.[141] The 2016 TR does not seem to have resolved the issue of the essentiality for potassium hydroxide in processing peaches, but the essentiality of other allowed uses also needs to be examined. We suggest that the HS address the following questions:

- For what purposes is potassium hydroxide used in organic processing?
- What are the alternatives for those uses?
- Is further annotation necessary?

Silicon dioxide §205.605(b) – Permitted as a defoamer. Allowed for other uses when organic rice hulls are not commercially available.

In 2011, the NOSB voted to annotate the listing to recognize and encourage the use of organic rice hulls as an alternative for most uses of silicon dioxide. The NOSB recommended the following annotation: "Allowed for use as a defoamer. May be used in other applications when non-synthetic alternatives are not commercially available.'' The NOP proposed and put into regulation instead this annotation: "Permitted as a defoamer. Allowed for other uses when organic rice hulls are not commercially available." NOP justified this change as follows, "AMS understands that the intent of the NOSB's recommendation is to allow the continued use of silicon dioxide as a defoamer and to require the use of a nonsynthetic substance instead of silicon dioxide when possible. To ensure clarity and consistency within the USDA organic regulations, AMS is proposing a modification to the NOSB's recommendation." The annotation in the final rule is less restrictive than the NOSB recommendation, and therefore allows the use of the synthetic silicon dioxide in cases where there is a nonsynthetic alternative other than organic rice hulls," which is contrary to OFPA §6517(d)(2).[142] According to the 2010 Technical Review (TR), other plant materials may be the basis for biogenic silica products.[143]

Conclusion
The NOSB should revisit the annotation to determine whether it should be changed to the language as originally passed by the NOSB or to a slightly less restrictive version (but still more restrictive than the

[138] https://archive.org/stream/commercialfreezi0703josl/commercialfreezi0703josl_djvu.txt
[139] Lines 557-558.
[140] Lines 239-243.
[141] TAP lines 376-378.
[142] "The Secretary may not include exemptions for the use of specific synthetic substances in the National List other than those exemptions contained in the Proposed National List or Proposed Amendments to the National List."
[143] Lines 438-448.

version adopted into the regulations), "Permitted as a defoamer. Allowed for other uses when an organic substitute is not commercially available."

Potassium lactate §205.605(b) – For use as an antimicrobial agent and pH regulator only.
Sodium lactate §205.605(b) – For use as an antimicrobial agent and pH regulator only.

NOC does not support the relisting of sodium and potassium lactate to the National List. Sodium and potassium lactate are synthetic preservatives and are not appropriate for use in organic food.

Sodium lactate and potassium lactate are synthetic.
As described in the Lactic Acid and Lactates Technical Review (TR), sodium lactate and potassium lactate are manufactured by a reaction of lactic acid with a synthetic chemical, generally sodium or potassium hydroxide.[144] Thus, they would be classified as synthetic according to the NOP draft classification guidance.

As stated in the Technical Review, The USDA Food Standards and Labeling Policy Book says:

> It should be noted that meat products that contain sodium and potassium lactates can no longer be labeled as "natural" without a case-by-case assessment of what function these materials are serving in the product, and at what levels (USDA FSIS 2005). The reason is that the lactates are likely to be used as "chemical preservatives," rather than as flavors.

We agree with comments submitted by our member organization PCC Natural Markets:

> Since sodium lactate is not acknowledged by the FSIS for use in meat products labeled "natural" (except potentially on a case-by-case basis at the time of label approval), it seems logical that sodium lactate should not be allowed for use in certified organic products. Consumers expect organic standards to be more rigorous than standards for "natural." It seems incongruous that organic would allow something that "natural" would not allow automatically.[145]

The use of sodium lactate and potassium lactate for the listed use is prohibited by organic regulations at §205.600(b)(4).
Both chemicals are used as preservatives, to prevent the growth of microorganisms. In addition, they are also considered flavor and color enhancers. They may also be combined with sodium diacetate.[146] Since sodium diacetate is not on the National List and is added for its functional effect of reducing pH, certainly any lactate product containing it should not be allowed.

§205.600(b)(4) of the regulations states:

> (b) In addition to the criteria set forth in the Act, any synthetic substance used as a processing aid or adjuvant will be evaluated against the following criteria:
> (4) The substance's primary use is not as a preservative or to recreate or improve flavors, colors, textures, or nutritive value lost during processing, except where the replacement of nutrients is required by law;

[144] Lines 519-548.
[145] Letter from Trudy Bialic, December 7, 2009.
[146] Lines 266-326.

Conclusion
Since the purpose for which the lactates were petitioned is as a preservative, and other uses include flavor and color enhancement, sodium lactate and potassium lactate have no place on the National List.

Potassium lactate and sodium lactate are synthetic chemicals used for purposes not allowed in organic processing. Therefore, they should not be relisted on the National List.

Livestock Subcommittee

Sunset

Foreword

In writing these comments, we reached out to livestock experts working in the field. Our comments reflect those of our membership, with input from those who work on organic dairies and with livestock daily. We heard repeatedly that prevention is our best weapon, and that modifying diets is a best practice in treating many of the issues livestock producers face. While many livestock producers rarely use any of the materials we are discussing because they excel at preventative medicine, it is vital to the welfare of animals that the tools are available when needed. Maintaining clearly listed materials is important to producers and is essential for consistency among certifiers when applying the standards.

Activated charcoal (CAS # 7440-44-0) §205.603(a)(6) – Must be from vegetative sources.

NOC supports the relisting of activated charcoal as essential to organic livestock health care and production. Activated charcoal is the preferred therapeutic treatment as needed for suspected poisoning by plants and moldy silage. Activated charcoal removes toxic chemicals by adsorption and is then excreted.

Calcium borogluconate (CAS # 5743-34-0) §205.603(a)(7) – For treatment of milk fever only.

NOC supports relisting as one of three types of available calcium that can be found in supplements for treatment of milk fever. Because organic dairies often have older cows in their herd than their conventional counterparts, having materials that treat milk fever, to which these older cows are more susceptible, is important and can be lifesaving.

It is the healthcare treatment that likely provides the most miraculous, short-term recovery to any bovine malady. If a cow is down with milk fever (down meaning flat on her side, unable to rise, urinate, defecate, or digest, etc.), her muscles are no longer working because of lack of calcium. If left untreated, the cow will die. But given a bottle or two of calcium borogluconate intravenously, within an hour or two, the cow will recover and arise (unless she has also suffered some physical injury) and be ready to fully go back to life.

Listing this outside of the broad category of electrolytes leaves it less open for interpretation by certifiers.
Prior to listing calcium borogluconate on the NL for treatment of milk fever, some certifiers would not allow it for use as an electrolyte. For example, OMRI prohibited its use as an electrolyte, and many certifying agents followed their lead. This may have been due to not considering the use of it to treat milk fever to be an electrolyte use. Or, and more likely, this was because calcium borogluconate is *injected* for treatment of milk fever and it was not specified on the NL that electrolytes could be injected. Both of these

theories were addressed in the 2015 technical report for electrolytes, which identified calcium borogluconate as an electrolyte. This showed that it is clearly allowed under the listing for electrolytes at 205.603(a)(11). This technical report does also mention the use of calcium borogluconate to treat milk fever, so it seems to indicate that injecting calcium borogluconate to treat milk fever is an allowed use for the substance, again under the listing for electrolytes at 205.603(a)(11).

At the same time that calcium borogluconate was added to the NL, injectable nutritive supplements, including vitamins, minerals, and electrolytes, were also specifically added to the National List at 205.603(a)(21). This does appear to make the separate listing for calcium borogluconate redundant, as certifiers can allow it as an injectable electrolyte under the listings at 205.603(a)(11) and (21).

With that being said, if calcium borogluconate was not listed separately on the NL, there may still be some certifiers out there that are inexperienced in material review and may prohibit calcium borogluconate used to treat milk fever erroneously if the product is not identified or labeled as an electrolyte. While the majority of certifiers, if not all, would allow calcium borogluconate as an injectable electrolyte under the listings at 205.603(a)(11) and (21) even if calcium borogluconate was not specifically separately listed on the NL, having the separate listing assures this is the case.

Conclusion
NOC supports the relisting of calcium borogluconate outside of the broad listing of electrolytes.

Calcium propionate (CAS # 4075-81-4) §205.603(a)(8) – For treatment of milk fever only.

NOC is generally supportive of relisting calcium proprionate on the NL for the treatment of milk fever for all of the same reasons given regarding calcium borogluconate. However, we—and the NOSB—are at a disadvantage in evaluating this material because a recent technical review is not available. The TAP review from 2002 raised the following issues and concerns:

- The level of concern is different for the routine use as a mold inhibitor than for the therapeutic use for milk fever.
- Most of the TAP review was concerned with the use as a mold inhibitor, and the therapeutic use was not examined as closely.
- It is not clear how calcium propionate compares with other materials in treating milk fever.
- The use as a mold inhibitor (i.e., a synthetic preservative) does not appear to be compatible with organic production.

Calcium propionate was used in organic cows for milk fever before 2018 by virtue of its inclusion as an electrolyte. There is a 2015 technical review of electrolytes, which has little to say about calcium propionate. While we have found reports of illness when calcium propionate is used as a preservative in food,[147] we cannot determine the relevance of these reports to the use for treatment of milk fever, and encourage the LS to seek a TR on calcium propionate.

Conclusion

[147] For example, Dengate, S. and Ruben, A., 2002. Controlled trial of cumulative behavioural effects of a common bread preservative. *Journal of Paediatrics and Child Health*, *38*(4), pp.373-376.

NOC is generally supportive of relisting calcium propionate on the NL for the treatment of milk fever; however, we encourage the LS to seek a more updated TR.

Chlorine materials §205.603(a)(10) – Disinfecting and sanitizing facilities and equipment. Residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act. – (i) Calcium hypochlorite. (ii) Chlorine dioxide. (iii) Hypochlorous acid—generated from electrolyzed water. (iv) Sodium hypochlorite

COMPREHENSIVE REVIEW OF SANITIZERS, DISINFECTANTS, AND STERILANTS

As NOC has repeatedly contended, the NOSB would benefit from a comprehensive review of sanitizers, disinfectants, and sterilants to inform decision-making when a new material is petitioned or a material is reviewed at sunset. As noted in previous comments on this topic, we recommend the TR for sodium dodecylbenzene sulfonate (SDBS) as a starting place because this TR asks and answers many of the questions that would be appropriate to address in a comprehensive review of sanitizers, disinfectants, and sterilants.

The NOSB could refer to the sanitation materials review to judge whether other materials currently on the National List meet the same need, or whether there is a special characteristic of the material under review that justifies its placement or renewal to the NL. This comprehensive review may help identify areas where there are gaps in necessary sanitizers or disinfectants which aid crops, livestock, and/or handling operations in promotion of organic food safety.

Request for a comprehensive review of sanitizers. OFPA requires that materials on the National List be itemized "by specific use or application." This requires the NOSB identify the uses for which these materials are needed. A Technical Review (TR) that establishes and distinguishes needs, uses, and relative toxicities for sanitizers, disinfectants, and sterilants must be performed. In particular, the TR must address the following:

- The uses for which these materials are needed;
- Whether an antimicrobial is the appropriate way to address the identified need;
- Whether any uses of specific materials in this class are required by law;
- Whether there are uses for which no material is listed on the National List;
- Whether organizations researching least toxic materials (e.g., EPA's Safer Choice/Design for the Environment program[148] and the Toxics Use Reduction Institute at the University of Massachusetts, Lowell[149]) have identified least toxic practices and materials that should be considered for use in organic production;
- Which alternative practices and materials might be proposed for each use that is identified; and
- The hazards to humans and the environment of the various options identified.

Conclusion

While this topic as a whole is daunting, we would suggest that the NOSB begin to address this one step at a time by requesting a TR to address the questions put forth in the spring 2021 published materials and every time a sanitizer, disinfectant, or sterilant comes up for petition or sunset review moving forward. We

[148] DfE for antimicrobials at https://www.epa.gov/pesticide-labels/design-environment-antimicrobial-pesticide-pilot-project-moving-toward-green-end. Safer Choice at https://www.epa.gov/saferchoice/safer-ingredients.
[149] https://www.turi.org/Our_Work/Cleaning_Laboratory.

appreciate the discussion at the spring 2021 NOSB meeting regarding a potential path forward and encourage work in this area.

Kaolin pectin §205.603(a)(17) – For use as an adsorbent, antidiarrheal, and gut protectant.

Pectin can be synthetic or nonsynthetic and would not need to be on the National List if only the nonsynthetic was allowed. As a natural, it never needed to be petitioned.

In contrast to activated charcoal, it coats the stomach and gut lining to some extent and helps "dry up" excessive fluid in the gut (which is the definition of diarrhea). Activated charcoal is an adsorbent organic carbon that can draw toxins to itself and "whisk" them away out of the digestive tract and thus not be absorbed. Not all producers may be as familiar with charcoal in place of kaolin pectin. In addition, availability may play a role: in areas where conventional livestock prevail, access to products is always an issue. This is an important tool for raising organic calves, as calf raising is generally one of the toughest areas to deal with on a dairy.

Conclusion
NOC supports relisting of kaolin pectin.

Mineral oil §205.603(a)(20) – For treatment of intestinal compaction, prohibited for use as a dust suppressant.

NOC received feedback that producers and veterinarians may not know they are allowed to use this material for this use in organic production, while others thought that people were using it for intestinal compaction before it ever got put on the NL. NOC is supportive of relisting. According to Dr. Hue Karreman, "Mineral oil has the property of not being absorbed by the gut and thus can coat the gut so there is no absorption and possible reabsorption downstream of toxins. It can be used for frothy bloat. It is indispensable to me as a practitioner to quickly reverse digestive upsets."[150]

Nutritive Supplements §205.603(a)(21) – Injectable supplements of trace minerals per paragraph (d)(2) of this section, vitamins per paragraph (d)(3), and electrolytes per paragraph (a)(11), with excipients per paragraph (f), in accordance with FDA and restricted to use by or on the order of a licensed veterinarian.

NOC supports relisting of nutritive supplements.

Nutritive supplements are important for animals that are off feed and not eating or not eating well enough to ensure intake of vitamins and minerals. Nutritive supplements ensure a precise amount of nutrients can be provided to animals, as needed. Dr. Hue Karreman notes, "The whole reason for the injectable electrolytes is for sick animals to be treated and rehydrated and boosted to fortify their immune system in the face of infection or other malady. If this category were removed, we would go back to the dark ages."[151]

[150] Private e-mail communication between Dr. Hubert Karreman and Christie Badger, NOC.
[151] Private e-mail communication between Dr. Hubert Karreman and Christie Badger, NOC.

Propylene glycol (CAS #57-55-6) §205.603(a)(27) – Only for treatment of ketosis in ruminants.

We had mixed reviews of this material from the livestock experts that we consulted. Review from Jill Smith, Pure Eire Dairy, spoke about the importance of prevention. Prevention of ketosis is by proper nutrition, not propylene glycol. In concert with this, it is important to review the recommendations on ketosis of Dr. Paul Dettloff.[152] Dr. Dettloff does not mention propylene glycol, but gives a number of suggestions for prevention (maintaining a high-energy diet before calving, including dry long-stemmed hay) and treatment (glucose IV, homeopathic lycopodium, molasses, and Wellness Tonic containing apple cider vinegar and aloe vera, with tinctures of rose hips, dandelion root and plantain.)[153] Dr. Hue Karreman noted, "We had devised various other methods of treating ketosis—there are various commercial preparations utilizing molasses, glycerin, and herbs that support liver function. Those methods are consistent with those outlined by Dr. Detloff."[154]

Alternatively, Dr. Dayna Locitzer, Green Mountain Bovine Clinic, noted that propylene glycol "is a very effective and easy treatment against ketosis. Before this, farmers were administering bottles of dextrose intravenous, which is not only a subpar treatment for the disease, it also is dangerous both for the farmer and for the cow. Intravenous Dextrose causes blood sugar spikes, preventing the cow from regulating her own blood sugar levels. It also causes abscesses under the skin when administered improperly. Also, when a cow is ketonic, she can be aggressive, making giving an IV dangerous. Glycerin was another option that was used in the past on organic farms and in study after study, it has been shown to not be as effective in resolving ketosis as propylene glycol."[155] Along these lines, Jill Smith also noted that intravenous treatments "are harder and harder to use as we have less people skilled in treating cows. The propylene glycol drenches are the easiest route."[156]

Zinc sulfate §205.603(b)(11) – Allowed for use in hoof and foot treatments only.

NOC supports relisting zinc sulfate and would suggest the following annotation: **Zinc Sulfate for use as a hoof treatment. Substance must be used and disposed of in a manner that minimizes accumulation of zinc in the soil, as shown by routine soil testing.**

While we recognize there are environmental and health risks in the production of this material, we also understand the need for this material, especially as an animal health tool for organic sheep and other hoofed mammals. The petition and Technical Review describe the environmental and health risks. Since sheep cannot use the current footbath substance listed, copper sulfate, and hoof problems are significant in this species, zinc sulfate has a place on the National List of approved synthetics. Organic sheep are a multi-use breed, providing fiber, dairy products, and meat to organic consumers.

NOC sees the use of zinc sulfate as similar to the use of copper sulfate used for cattle foot baths and would like to see the NOSB work towards adding a similar annotation as listed above to the current copper sulfate

[152] Paul Dettloff, 2009. *Alternative Treatments for Ruminant Animals*, revised and expanded edition. Acres U.S.A. Austin, TX.
[153] Details at http://drpaulslab.net/dairy-treatment/ and http://drpaulslab.net/products/.
[154] Private e-mail communication between Dr. Hubert Karreman and Christie Badger, NOC.
[155] Private e-mail communication between Dr. Dayna Locitzer, Green Mountain Bovine Clinic, and Christie Badger, NOC.
[156] Private e-mail communication between Jill Smith, Pure Eire Dairy, and Christie Badger, NOC.

livestock wording on the national list. **205.603 (b) (1) Copper sulfate. Substance must be used and disposed of in a manner that minimizes accumulation of copper in the soil, *as shown by routine soil testing.***

This proposed annotation for copper sulfate and zinc sulfate as allowed for organic livestock brings the livestock listing into harmony with the various copper listings in the crops section of the National List.

As the disposal method for footbath solutions containing either or both copper sulfate and/or zinc sulfate could include mixing with manure and spreading on fields, we feel that the organic farmer should be monitoring this application. The use and disposal must not bring up the zinc or copper levels in the soil to a percentage that causes concern. Organic certification agencies can easily track the compliance to this annotation through monitoring of soil tests, similar to what is currently done under the crops annotation for coppers.

As with all synthetics of toxicological concern, we hope the organic livestock community will continue to research more benign materials for topical or footbath use, so we can eventually remove these materials from the allowed portion of the National List.

Materials Subcommittee

Discussion Documents

Excluded Methods

NOC applauds and appreciates the efforts of the NOSB in moving the work on excluded methods forward.

In 2011 and 2012, a number of confusing issues came before the NOSB and the NOP. This sparked a reexamination of the excluded methods definition, years of sustained work on the part of the NOSB, and open dialogue within the organic community. An NOSB discussion document on excluded methods was put forward in 2013, which generated significant public comment. A second NOSB discussion document posted in September 2014 and in April 2015 analyzed the comments received and proposed options for the NOSB review and evaluation of new GE technologies and methods. The NOSB also acknowledged that this issue would require continuous work on their part to evaluate and provide recommendations to the NOP about new technologies as they emerge.

Throughout this entire process of dialogue and debate, the organic community and NOSB have been clear and consistent in their opposition to genetic engineering in organic agriculture and the need to provide a transparent process and certainty to the organic community - including certifiers, operations, and consumers - about what is excluded, what is allowed, and why.

Further, during the National Organic Program Update at the fall 2019 NOSB meeting in Pittsburgh, PA, Dr. Tucker clearly stated in her presentation (emphasis added):

- The **Excluded Methods** definition in the USDA organic regulations does not allow for gene editing: it is prohibited.
- USDA encourages continued **robust dialogue** about the role of new technologies and innovations in organic agriculture.

- Changing the definition of Excluded Methods is **not** on the USDA regulatory agenda.[157]

NOC appreciates and agrees with the clarification that gene editing is excluded in organic based on the existing definition for 'excluded methods' in the organic regulations. However, additional clarity is needed to prevent inconsistencies for the many GE methods that have emerged. In addition, **failure to continue work in this area will negatively impact organic plant breeders and the organic seed industry, who need certainty to advance plant breeding efforts that meet the needs of organic operations.**

NOC urges the NOP to codify the unanimous recommendations made by the NOSB that have been strongly supported by stakeholders, and that is because we do not want to allow any room for misinterpretation. In addition, we must be very clear regarding what is and is not allowed and communicate that very clearly to all stakeholder groups.

This is a complicated area, and the NOSB and NOP must be a place where the organic community can go to find answers and direction. We cannot have inconsistency among certifiers in what they allow when considering methods. The framework put in place by the NOSB in the fall of 2016 should be formally adopted by the NOP and codified as a guidance document. The NOSB process of defining and clarifying what should be excluded as a method uses and builds on the current excluded methods definition in the organic regulations to encompass new technologies that have emerged since this definition was adopted in 1995 due to rapid advances in recombinant DNA biotechnology.

Since 2016, the NOSB has clarified in unanimous recommendations that the following eleven methods are excluded in organic: Targeted genetic modification, gene silencing, accelerated plant breeding techniques, synthetic biology, cloned animals and offspring, plastid transformation, cisgenesis, intragenesis, agro-infiltration, transposons developed via use of in vitro nucleic acid techniques, and induced mutagenesis through in vitro techniques. **The NOP should codify the prohibition in organic for these eleven methods by publishing a guidance document for the NOP handbook to ensure clarity for all stakeholder groups.**

All of the NOSB recommendations on excluded methods since fall 2016 have been unanimous, which reflects the organic community's united stance that genetic engineering should be prohibited in organic. Genetic engineering is a threat to the integrity of the organic label. Both organic producers and consumers reject the inclusion of genetic engineering in organic production.

The NOSB has also passed unanimous recommendations that marker assisted selection, transduction, embryo rescue in plants, and embryo transfer in animals should be allowed in organic. **The NOP should codify that these four methods are allowed in organic by publishing a guidance document for the NOP handbook to ensure clarity for all stakeholder groups.**

The NOSB is still receiving public comment and evaluating the status of 6 'to be determined' techniques: protoplast fusion, cell fusion within plant family, tilling, double haploid technology, some forms of induced mutagenesis, and transposons produced from chemicals, ultraviolet radiation, or other synthetic activities. In addition, continued work to evaluate which techniques should be prohibited in organic will be necessary as new technologies emerge. **As we describe below, NOC supports listing "cell fusion and protoplast fusion within the same taxonomic family" as NOT excluded.**

The NOSB must move forward with urgency, but with great care, to determine the status for these 'to be determined' technologies and other GE technologies that emerge to provide clarity to all stakeholder

[157] National Organic Program Update, October 2020, Slide 30 of 32.

groups. The NOSB must solicit input from scientists, plant breeders, and other organic stakeholder groups in making these determinations. **In particular, failure to continue work in this area will negatively impact organic plant breeders and the organic seed industry, who need certainty to advance plant breeding efforts that meet the needs of organic operations.**

NOC strongly supports the four evaluation criteria used to determine whether methods should be excluded, with a minor edit, as noted below. **The NOP should codify these criteria by publishing a guidance document for the NOP handbook to ensure clarity for all stakeholder groups.** We encourage the NOSB to continue to bring methods forward for evaluation in a transparent way that allows input from all stakeholder groups.

The NOP should swiftly implement the NOSB's organic seed recommendations.
NOC would also like to note that the majority of the seed planted on organic farms is conventional, untreated seed. Consistent application of organic seed requirements is fundamental to promote the investment in breeding and production of varieties for organic farming systems and developed within organic frameworks. We applaud the work of the NOSB to pass recommendations for updated organic seed regulations and guidance in recent years, and strongly urge the NOP to adopt these changes through rule making and guidance documents. We see the topic of organic seed requirements as being closely connected to the topic of excluded methods because decisions and actions for the NOSB and NOP on both topics have significant impacts on organic plant breeding. We encourage the NOSB and NOP to continue to focus energy on strengthening organic seed availability, usage, and enforcement among organic growers. As long as the loophole in the organic seed usage regulation exists, organic growers will continue to source conventional untreated seed of varieties that may have been developed using excluded methods but remain undisclosed.

Below are to the questions posed in the published materials.

1. **Should the NOSB prioritize developing additional criteria for excluded methods determinations before continuing to work on the remaining TBD list techniques?**

We do not see a need for developing additional criteria for excluded methods determinations at this time. It is imperative to the integrity of the NOSB's process that the same criteria be applied to all methods that have been reviewed and are still under review by the NOSB. There is a sense of urgency to complete decision making on the current excluded methods table and adding new criteria would slow the process down even further, as it would require past recommendations to be revisited.

While we strongly recommend that no new criteria be added to the framework, we recommend an edit to the language in the first criterion for scientific accuracy:

> The genome is respected ~~as an indivisible entity,~~ and technical/physical insertion, deletions, or rearrangements in the genome is refrained from (e.g., through transmission of ~~isolated~~ synthetic DNA, RNA, or proteins). In vitro nucleic acid techniques are considered to be an invasion into the plant genome.

Regarding our suggested change to the first sentence above, the genome does change in nature, and these changes may be genetically indistinguishable from changes made through human-induced methods. In other words, the genome is a divisible entity in nature, and stating otherwise makes this criterion scientifically unsound. We also suggest replacing "isolated" with "synthetic" to emphasize sequences that come from de novo synthesis.

As a reminder, when an ad hoc committee was formed in 2016 to advise on these criteria, the consensus at that time was to not include the language "as an indivisible entity." It's unclear as to why this language was included in the final proposal. The reason we are making this suggestion now is because we have been hearing complaints recently from the scientific community about how this statement undermines the NOSB's, and broader organic community's, credibility.

2. **Is Policy Memo 13-1 complete and applied consistently in organic systems, i.e., do cell fusionand protoplast fusion need to remain on the TBD list or can they be moved to the excluded method section with the notes that allowance is made for these techniques when employedwithin taxonomic plant families?**

It is important to first recognize that cell fusion is already clearly listed as an excluded method per the regulatory definition (7 CFR 205.1). What the NOP Policy Memo 13-1 deems an allowable method is cell fusion and protoplast fusion *within taxonomic plant families*. "Cell fusion and protoplast fusion within the same taxonomic family" should be moved to the list of methods determined to **NOT** be excluded. This is consistent with Policy Memo 13-1 and clarifies that this method – again, when employed within taxonomic families – is viewed as traditional plant breeding and not genetic engineering.

NOC believes Policy Memo 13-1 is a clear, strong, and complete document, and provides important clarity for the organic industry. We have heard from the Organic Seed Alliance that organic plant breeders, organic seed companies, organic growers, and organic certifiers find Policy Memo 13-1 to be an important touchstone for guiding their decisions. Upholding Policy Memo 13-1 is therefore essential to the success of organic operations, especially when considering the extensive use of cell fusion and protoplast fusion within taxonomic plant families, including within the organic seed trade.

3. **As the NOSB makes excluded methods determinations on the remaining TBD list techniques, should this organic system include allowance for historical use and a time frame for phasing outexcluded uses?**

Depending on remaining NOSB recommendations – mutagenesis and double haploids loom large – there may not be methods in need of historic allowance. If a method that is currently in wide use by organic growers is determined to be excluded down the road, then a timeframe for phasing it out, coupled with an allowance of historical use, will likely be necessary.

Conclusion

- **The NOP should codify the prohibition in organic for the eleven methods identified by the NOSB by publishing a guidance document for the NOP handbook to ensure clarity for all stakeholder groups.**
- **The NOP should codify that the four methods identified by the NOSB are allowed in organic by publishing a guidance document for the NOP handbook to ensure clarity for all stakeholder groups.**
- **The NOP should codify the four evaluation criteria used to determine if methods should be excluded by publishing a guidance document for the NOP handbook to ensure clarity for all stakeholder groups.**
- **The NOP should swiftly implement NOSB's organic seed recommendations.**

- **Failure to continue work in this area will negatively impact organic plant breeders and the organic seed industry, who need certainty to advance plant breeding efforts that meet the needs of organic operations.**

While NOC refers to guidance in this comment as a way to implement the NOSB recommendations on excluded methods, we ask the NOP and NOSB to discuss the best ways to have these recommendations be consistent between certifiers and enforceable on all operations. This may include having some of the criteria and definitions incorporated into the regulations. To provide stronger consistency between certifiers and give clear direction to accreditation auditors, placing the list of excluded and allowed methods in an instruction to certifiers should be considered.

Policy Development Subcommittee (PDS)

Discussion Documents

Oral and Written Comment Submissions

NOC thanks the subcommittee for thinking through these issues, and for posing questions to the community. As we move into a more virtual environment, the ways in which we interact will evolve in ways that we do not yet know. We appreciate the open lines of communication on this topic.

We agree that there is disproportionate access to the NOSB, much of which takes place behind the scenes. We are grateful for the integrity of those NOSB members who refuse to take part in such backdoor dealings. Transparency is a core tenet of how we work.

Due to differences in access to the in-person meetings, we are in favor of multiple ways for stakeholders to engage in this process. In particular, we appreciate the thought given to putting additional, clear constraints around written comments, and we think that will do more to level the playing field than the various options presented regarding oral comments. Our comments will focus on answering the questions put forth by the subcommittee.

1. **Should the Board move to an entirely virtual format for oral comments the week before in-person meetings or maintain the pre-pandemic format of hearing oral comments, both virtually prior to the in-person meeting as well as in-person at the public NOSB meeting?**

We support oral comments in both a virtual and in-person format. This offers the Board an opportunity to hear oral comments virtually, digest written comments submitted, and ask additional questions during in-person oral comments to clarify points, as needed.

2. **If NOSB meetings move to a model wherein all oral comments are heard virtually the week before the meeting, would it reduce the attendance of stakeholders at the Board meeting?**

There are different considerations for why people attend the meetings. There are both financial and time considerations for whether or not people attend in-person meetings. If people do not have an opportunity to speak and be heard at the meeting, it will have an impact on who will attend.

As noted above, we are strongly in favor of continuing to have oral comments in both a virtual and in-person format.

3. **Restrictions due to the pandemic aside, would the availability of a live-stream meeting discourage in-person attendance?**

Given the fact that we can, having meetings livestreamed should be a baseline. In addition to this, experts and others should be provided the opportunity to participate on panels virtually, opening up the opportunity to enrich our knowledge and deepen the well of experts that we can call on to inform discussions.

We do not feel that a livestream format would discourage in-person attendance, but rather that it would make the meeting more accessible for those stakeholders who are not fiscally or logistically able to attend.

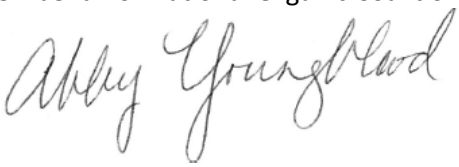
4. **Is the practice of scheduling multiple oral comments by a single organization (such as a business/company/non-profit/trade group) inherently unfair? Is there a path by which the Board can field multiple areas of expertise from a single organization, while balancing the limits of time, fairness, and the importance of receiving a wide range of stakeholder feedback?**

We do not think that scheduling multiple oral comments by a single organization is inherently unfair. We value and respect the fact that some organizations dedicate significantly more time and resources to contributing to the work of the NOSB than others. We also value the diversity of expertise that can be offered by different speakers, regardless of their affiliation. Everyone deserves their three minutes to comment, regardless of affiliation.

Virtual, in-person, and written comments should all be weighed and considered equally.

Thank you for your consideration of these comments.

On behalf of National Organic Coalition Members:



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National Organic Coalition Members:
Beyond Pesticides
Center for Food Safety
Consumer Reports
Equal Exchange
Maine Organic Farmers and Gardeners Association
Midwest Organic and Sustainable Education Service
National Co+op Grocers
Nature's Path
Northeast Organic Dairy Producers Alliance
Northeast Organic Farming Association – Interstate Council
Ohio Ecological Food and Farm Association

Organic Seed Alliance
PCC Community Markets
Rural Advancement Foundation International – USA

Appendix A

Letter to Secretary Vilsack regarding the role of organic agriculture in mitigating climate change

August 3, 2021

Ms. Michelle Arsenault
National Organic Standards Board
USDA-AMS-NOP
1400 Independence Ave., SW.
Washington, DC 20250-0268

Re: **Open Docket: Letter to Secretary Vilsack; Docket # AMS-NOP-21-0038**

Submitted electronically

Dear Ms. Arsenault and Compliance, Accreditation & Certification Subcommittee Members,

Thank you for communicating with Secretary Vilsack about the role of organic agriculture in mitigating climate change. We applaud the NOSB for communicating directly with the Secretary on this issue and we hope the NOSB will continue to elevate issues of critical importance with the Secretary, particularly for cross-cutting issues for which USDA has a role to play in advancing and protecting organic in programs and policies that extend beyond the National Organic Program.

NOC also applauds the NOSB for making use of the open docket to further this work and solicit feedback in advance of the NOSB meeting. We believe the open docket is a critically important tool for the NOSB to engage stakeholders in a public manner to hone and refine proposals before they come forward for a full Board vote.

Below are three suggestions for your consideration as you finalize the letter to Secretary Vilsack.

1. **The NOSB should discuss the critical role of organic agriculture in bolstering the resiliency of the U.S. food and farm system.**

We appreciate that the NOSB has highlighted the role of organic in reducing emissions and sequestering carbon in the soil. The letter, however, does not discuss the important role of organic agriculture in creating more resiliency.

By design, organic agriculture builds resilience in the system of food production. Growing strong crops and livestock on healthy soils with bountiful biodiversity above and below ground facilitates the ability of organic systems to tolerate, adapt to, and recover from extreme weather conditions.

- High levels of organic matter in organic farm soils increase soil water retention, porosity, infiltration, and prevent nutrient loss and soil erosion. These soil properties make agriculture more resistant to flooding, drought, high winds, and the loss of soil organic carbon.
- Diverse cropping and intercropping on organic farms keep pest and predator relationships in check, decreasing crop susceptibility to insect pests and disease and increasing crop resiliency and adaptability to the extreme variabilities of climate change.

According to the Organic Farming Research Foundation:[158]

> *Healthy soils form the foundation of organic production. Healthy soils have good structure (tilth), which allows them to absorb and hold moisture, drain well, maintain adequate aeration, and foster deep, healthy crop root systems. Such soils sustain crops through dry spells, require less irrigation water, and undergo less ponding, runoff, and erosion during heavy rains.*
>
> *The USDA National Organic Standards require certified producers to implement crop rotation, cover cropping, tillage, nutrient management, and other practices that improve and maintain the physical, chemical, and biological condition of the soil.*

According to the Organic Trade Association:[159]

> *Soils high in organic matter support healthy crops, are less susceptible to drought, and foster a diversity of organisms vital to soil health. Organically managed soils have greater biological activity, greater soil stability, more biomass and higher diversity than conventionally managed soils.[11] Organic managed soils also tend to have higher water-holding capacity, porosity, and aggregate stability than conventionally managed soils, which can protect against yield losses in extreme weather events such as droughts and flooding.[29, 30, 31] These resiliency factors mean that organic may fare better as our planet continues to experience extreme weather events resulting from climate change. The appeal of organic is that its benefits are not limited to one operation or plot of land. The entire community benefits from improved water dynamics, increased biodiversity, and increased adaptability when faced with an uncertain future.*
>
> *Although organic production is generally less productive than intensive conventional operations in the short-term, studies show that organic has higher yields in extreme weather events (like drought and/or excessive rainfall). [29, 32] A 2020 study shows that even with lower yields, greenhouse gas emissions for organic production were so much lower than conventional production that even on a per unit basis of production comparison, organic's global warming potential was lower.[33] Furthermore, the yield gap between organic and conventional production continues to shrink as organic production practices are better understood and researched. The*

[158] https://ofrf.org/organicforclimate/

[159] https://ota.com/sites/default/files/indexed_files/OrganicTradeAssociation_ClimateChange_WhitePaper_PlanetOrganic.pdf

magnitude of the yield gap varies by crop type and management practices, and in some cases the yields in organic are equal or greater than conventional counterparts. Organic farming systems have long-term environmental conservation values while simultaneously supporting positive economic and human health outcomes.

2. **The NOSB should urge Secretary Vilsack to strengthen enforcement of the soil health provisions in the organic regulations.**

In the following paragraph towards the end of the letter, NOC suggests that the NOSB add the following language (see blue text):

The Organic Foods Production Act (OFPA), 7 U.S.C. §§ 6501-6522, requires that organic farmers select and implement tillage and cultivation practices that maintain or improve the physical, chemical, and biological condition of soil and minimize soil erosion. Furthermore, OFPA requires that organic farmers maintain or improve soil organic matter content. In other words, OFPA codifies regenerative agriculture through the requirements it places on organic farmers to build and maintain soil health. We urge the USDA to increase enforcement efforts to ensure that certifiers are verifying full compliance with the soil health requirements of the USDA organic standards.

3. **The NOSB could highlight the opportunity to increase domestic production of organic to meet consumer demand for organic food.**

NOC suggests that the NOSB add the following language (see blue text) to this paragraph:

● *Support new and better markets* (page 9): The organic market is already thriving, with organic food retail sales exceeding $56 billion in 2020 as reported by OTA. However, domestic organic production is not keeping pace with demand, requiring more imports to fill the gap. Prioritizing transition-to-organic market development is strongly encouraged to continue to remove barriers for producers choosing to convert to organic production and to ensure that the economic and environmental benefits of organic production accrue to U.S. farms and communities. Overall, a greater reliance on certified organic products in the climate smart strategy would solve the 'finding a market' for environmentally friendly food and agricultural products, and investing federal funds into further developing the domestic organic market and organic production to meet that demand is likely to have a sizeable impact.

We would like to draw your attention to the notes[160] and slide deck[161] from a presentation by Mark Schonbeck, researcher at the Organic Farming Research Foundation, during the NOC Pre-NOSB meeting

[160] https://app.box.com/file/799055973715?s=xztg7swo7dnnx5q9vske5aqfe89tbw3z

[161] https://app.box.com/s/yzztvm1w1nk3tu3x1x7fvpyshej08537

on April 15, 2021. In this presentation, Dr. Schonbeck discusses emerging scientific research and some of the more difficult questions about the benefits and opportunities for organic agriculture in the climate change debate.

We would also like to draw your attention to comments submitted in the open docket by NOC member organization Beyond Pesticides.

NOC supports the general thrust of the letter and we appreciate the NOSB's work to communicate with the Secretary on this topic.

Thank you for considering our comments.

Sincerely,

Abby Youngblood
Executive Director

Appendix B

NOC Ammonia Extract Comment – Spring 2021

NOC agrees with the petitioner that nonsynthetic ammonia extracts should be listed on §205.602 as prohibited nonsynthetic inputs. Ammonia extracts—synthetic or nonsynthetic—are harmful to soil organisms and inconsistent with organic production. While the use of synthetic ammonia extracts can be prevented by merely not listing them on §205.601, the use of nonsynthetic ammonia extracts can be prevented only by listing them on §205.602.

NOC wants to take this opportunity to note that ammonia extracts are not the only nonsynthetic nitrogen fertilizers that are inconsistent with fundamental principles of organic production. Two widely used materials are Chilean nitrate and soybean hydrolysates. There are others and will be more. NOC believes that this is the time to regulate fertilizers that bypass the benefits from the soil fertility and crop nutrient management practices required by the organic standards and instead provide highly available crop nutrients.

Due to the number of new Board members, we feel it is important to share our fall 2020 comments regarding this petition. We are including additional information directly related to the discussion document that shows that the use of ammonia is caustic, decreases soil pH, and is known to decrease soil biotic activity.

Use of ammonia extracts is incompatible with organic production.
In contrast to the reductionism of "conventional" chemical-intensive agriculture, the origins of organic agriculture are in holistic and ecological thinking. Historically, perhaps the most important principle of organic production is the "Law of Return," which, together with the foundational philosophy "Feed the soil, not the plant" and the promotion of biodiversity, provide the ecological basis for organic production.[162] Together these three principles describe a production system that mimics natural systems.

The Law of Return. In an organic system, residues are returned to the soil by tillage, composting, or mulching. While most organic growers depend on some off-site inputs, most of the fertility in a soil-based system comes from practices that recycle organic matter produced on-site. The cycling of organic matter and on-site production of nutrients—as from nitrogen-fixing bacteria and microorganisms that make nutrients in native mineral soil fractions available to plants—is essential to organic production. The Law of Return is not about feeding plants, but about conserving the biodiversity of the soil-plant-animal ecological community.

The Law of Return says that we must return to the soil what we take from the soil. Non-crop organic matter is returned directly or through composting plant materials or manures. To the extent that the cash crop removes nutrients, they must be replaced by cover crops, crop rotation, animal manures, or additions of off-site materials, when necessary.

[162] See Sir Albert Howard. The Soil and Health: The Study of Organic Agriculture (1940), and An Agricultural Testament (1947).

Feed the soil, not the plant. The dictum to “Feed the soil, not the plant” reminds us that the soil is a living superorganism that supports plant life as part of an ecological community. We do not feed soil organisms in isolation, to have them process nutrients for crop plants; we feed the soil to support a healthy soil ecology, which is the basis of terrestrial life.

Biodiversity. Finally, biological diversity is important to the health of natural ecosystems and agroecosystems. Biodiversity promotes balance, which protects farms from outbreaks of damaging insects and disease. It supports the health of the soil through the progression of the seasons and stresses associated with weather and farming. It supports our health by offering a diversity of foods. Ultimately, holistically healthy, truly organic farms produce healthy plants that require far fewer applications of insecticides and fungicides (even if approved for organic production).

In the case of ammonia extracts, we are particularly interested in the principle of feeding the soil rather than the crop. OFPA §6513(b) requires that organic operations establish a plan designed to “foster soil fertility, primarily through the management of the organic content of the soil through proper tillage, crop rotation, and manuring.”

Substances of high solubility, i.e., those materials that provide nutrients directly to the plant because they are quickly taken up into the plant from the soil solution, are counter to foundational organic principles, so they have always been restricted. Such materials are listed in §205.602—Nonsynthetic substances prohibited for use in Organic Crop Production or the “prohibited naturals” section of the National List:

> 1) Calcium chloride is limited to treating a physiological disorder;
>
> 2) Potassium chloride must be used in a manner that minimizes chloride accumulation in the soil; and
>
> 3) Sodium nitrate is restricted to no more than 20% of the crop's total nitrogen requirement. (The NOSB has voted to remove the annotation, making this an absolute prohibition, but NOP has not, as yet, implemented this recommendation; the USDA has stated that the listing with sodium nitrate with the 20% restriction on §205.606 is invalid.)

The organic regulations limit substances of high solubility.
In the preamble to the publication of the NOP Final Rule on December 21, 2000, NOP discusses how it decided to agree with the NOSB recommendation and to put specific regulation of substances of high solubility into the annotations for each of these materials where they appear on the National List of Allowed and Prohibited Substances. NOP goes on to say, "Based on the recommendation of the NOSB, the final rule would prohibit use of these materials [substances of high solubility], unless the NOSB developed recommendations on conditions for their use and the Secretary added them to the National List."

At the time, the discussion was about mined substances of high solubility because there were no concentrated, highly soluble plant nutrient materials other than mined sources available at that time.

New materials of high solubility should be prohibited or restricted. These highly soluble materials, most of which are nonsynthetic, do not appear on the National List and are used in soil-based production, as well as in some hydroponic and container systems. Highly soluble sources of plant nutrients should be prohibited or restricted through listing on §205.602 so as to not allow organic producers to stray from the foundational principle of organic production to "feed the soil, not the plant."

Use of ammonia extracts is not necessary for organic production.
As discussed above, the principle of "feed the soil, not the plant" is foundational to organic production. Consequently, organic practices have grown up without the use of highly soluble nutrients. Organic producers instead use practices such as cover cropping, crop rotations, nitrogen fixing legumes, compost, manure, and other sources of fertility.

One commenter in favor of the allowance of ammonia extracts in organic production is quoted in the published materials as saying that, "The aspect of soil-biological fertility is beginning to recognize that bio-based fertilizers that are organic concentrates high in ammonium have a large impact on the release of nutrients from organic materials in the soil and offer the potential to increase our ability to supply nutrient dense foods to feed the world."[163] The "feed the world" argument used by conventional agriculture advocates no longer holds water. When discussing the Farming Systems Trial that is the longest running side-by-side comparison of conventional and organic grain farming in North America, scientist Yichao Rui, PhD, who oversees soil health research at the Rodale Institute, noted that, "Over the 40 years, on average, there's no statistical difference in yield between conventional and organic. Also, in climate change scenarios, like years of drought, organic keeps performing better than conventional. We have found 30% higher yields in organic than conventional in years of drought."[164]

"The long-term consequences of continued reliance on current conventional production practices will be a decline in soil productivity that increases the need for synthetic N fertilization, threatens food security, and exacerbates environmental degradation."[165] "For the sake of agricultural productivity and ecosystem stability, special attention must be given to soil organic matter because of its key role in maintaining soil aggregation and aeration, hydraulic conductivity and water availability, cation-exchange and buffer capacity, and the supply of mineralizable nutrients."[166]

Use of ammonia extracts is harmful to the environment, including soil organisms.
Ammonia is toxic, both to humans[167] and to soil organisms.[168] Applications of ammonia decimate soil fungi and nematodes.[169] Nitrogen fallout into forests is implicated in reduction of habitat suitability for

[163] NOSB April 2021 proposals and discussion documents. Page 55 of 172.
[164] Lisa Elaine Held. February 18, 2020. *The Real Climate Impact of Organic Farming.* Food Print. https://foodprint.org/blog/the-real-climate-impact-of-organic-farming/
[165] R.L. Mulvaney, S.A. Khan, T.R. Ellsworth. Synthetic Nitrogen Fertilizers Deplete Soil Nitrogen: A Global Dilemma for Sustainable Cereal Production. Journal of Environmental Quality. November 1, 2009. https://doi.org/10.2134/jeq2008.0527
[166] *Ibid.*
[167] https://pubchem.ncbi.nlm.nih.gov/compound/Ammonia#section=Toxicity.
[168] https://certifiedcropadviser.org/files/certifications/certified/education/self-study/exam-pdfs/157.pdf.
[169] Eno, C.F., Blue, W.G. and Good Jr, J.M., 1955. The effect of anhydrous ammonia on nematodes, fungi, bacteria, and nitrification in some Florida soils. *Soil Science Society of America Journal*, *19*(1), pp.55-58.

native forest vegetation.[170] Highly soluble nutrients such as ammonia extracts move in runoff or eroded soil to surface water, where even extremely low concentrations harm aquatic life.[171] Ammonia gas released from agriculture is a contributor to biodiversity loss.[172] Ammonia gas is often found in the form of aerosols of small particles (PM 2.5).[173] PM 2.5 is considered a major environmental threat to human health because, when inhaled, it may reach the peripheral regions of the bronchioles and interfere with gas exchange inside the lungs, where it contributes to cancer and respiratory and cardiovascular disease.[174]

The discussion document notes that "comments opposed to the prohibition noted that the addition of ammonia extract does not degrade soil health and that they would not have a negative impact on biological activity and organic matter changes. In fact, they would increase the ability of soils to cycle nutrients and would lead to increased soil organic matter."[175] In fact, these exacts do degrade soil health by reducing the biological condition of the soil and are not in line with improving soil organic matter content.

When considering the effects on soil organisms, most studies use the analysis of phospholipid fatty acids (PLFAs).

> Phospholipid fatty acids (PLFAs) are key components of microbial cell membranes. The analysis of PLFAs extracted from soils can provide information about the overall structure of terrestrial microbial communities. PLFA profiling has been extensively used in a range of ecosystems as a biological index of overall soil quality, and as a quantitative indicator of soil response to land management and other environmental stressors.[176]

In studies that compare the use of manuring versus inorganic fertilizers, it has been shown time and time again that "examination of the PLFA (phospholipid fatty acids) by functional groups showed that AN (ammonium nitrate) treatment generally shifted the PLFA functional groups in the opposite direction

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[170] McDonnell, T.C., Belyazid, S., Sullivan, T.J., Bell, M., Clark, C., Blett, T., Evans, T., Cass, W., Hyduke, A. and Sverdrup, H., 2018. Vegetation dynamics associated with changes in atmospheric nitrogen deposition and climate in hardwood forests of Shenandoah and Great Smoky Mountains National Parks, USA. *Environmental Pollution*, *237*, pp.662-674.

[171] https://www.mda.state.mn.us/ecological-effects-ammonia.

[172] Guthrie, Susan, Sarah Giles, Fay Dunkerley, Hadeel Tabaqchali, Amelia Harshfield, Becky Ioppolo, and Catriona Manville, Impact of ammonia emissions from agriculture on biodiversity: An evidence synthesis. The Royal Society, 2018. https://www.rand.org/pubs/research_reports/RR2695.html.

[173] Erisman, J.W. and Schaap, M., 2004. The need for ammonia abatement with respect to secondary PM reductions in Europe. *Environmental Pollution*, *129*(1), pp.159-163.

[174] WHO (World Health Organization). 2005. Air quality and health. http://www.who.int/mediacentre/factsheets/fs313/en/index.html.

[175] NOSB April 2021 proposals and discussion documents. Page 53 of 172.

[176] Quideau, S. A., McIntosh, A. C., Norris, C. E., Lloret, E., Swallow, M. J., & Hannam, K. (2016). Extraction and Analysis of Microbial Phospholipid Fatty Acids in Soils. *Journal of visualized experiments : JoVE*, (114), 54360. https://doi.org/10.3791/54360

from manuring"[177] and that inorganic fertilizers contribution to "decline in soil pH and SOC (soil organic carbon) (Ozlu, 2018)."[178] In addition, studies show that "soil management practices, such as manuring, that result in accumulations of organic carbon will result in increased microbial biomass and changes in community structure."[179] "The microbial community resulting from the AN treatment was typified by lower biomass than in the manured treatments, and a higher relative proportion of Gram-positive bacteria when compared to the CT (no nutrient additions) and manured soils."[180] "Indeed, soil pH in the surface 0± 5 cm was significantly lower in the AN treatment, and it is likely that this had an impact on the microbial community."[181]

Reactive nitrogen gases are a contributor to climate change.
Carbon dioxide is not the only concern when it comes to the global climate crisis. Reactive nitrogen released by agriculture is a contributor to climate change. Nitrous oxide (N_2O) is considered to be a potent greenhouse gas (GHG), with approximately 300 times the warming potential of carbon dioxide.[182,183,184] The largest sources of nitrous oxide in agriculture are fertilized soil and animal waste. "In the U.S. alone, the use of fertilizer has risen more than 200 percent over the past 60 years, even though the amount of cropland has stayed relatively constant. At the same time, the number of large industrialized livestock operations has also gone up, creating more manure 'lagoons' and excess manure, which is often over-applied on cropland."[185] These are exactly the types of conventional agricultural practices that organic guards against. Nonsynthetic ammonia extracts are derived from the manure from concentrated animal feeding operations (CAFOs), the same large, industrialized livestock operations that are contributing to excessive amounts of nitrous oxide being released into the atmosphere.

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[177] A.D. Peacock, M.D. Mullen, D.B. Ringelberg, D.D. Tyler, D.B. Hedrick, P.M. Gale, D.C. White. *Soil microbial community responses to dairy manure or ammonium nitrate applications.* Soil Biology & Biochemistry. 33 (2001) 1011-1019. http://davidcwhite.org/fulltext/515.pdf

[178] Ekrem Ozlu, Saroop S. Sandhu, Sandeep Kumar, Francisco J. Arriaga. *Soil health indicators impacted by long-term cattle manure and inorganic fertilizer application in a corn-soybean rotation of South Dakota.* Scientific Reports. (2019) 9:11776. https://doi.org/10.1038/s41598-019-48207-z

[179] A.D. Peacock, M.D. Mullen, D.B. Ringelberg, D.D. Tyler, D.B. Hedrick, P.M. Gale, D.C. White. *Soil microbial community responses to dairy manure or ammonium nitrate applications.* Soil Biology & Biochemistry. 33 (2001) 1011-1019. http://davidcwhite.org/fulltext/515.pdf

[180] *Ibid.*

[181] *Ibid.*

[182] Sabrina Shankman. *What is Nitrous Oxide and Why Is It a Climate Threat?* Inside Climate News. September 11, 2019. https://insideclimatenews.org/news/11092019/nitrous-oxide-climate-pollutant-explainer-greenhouse-gas-agriculture-livestock/.

[183] R.L. Mulvaney, S.A. Khan, T.R. Ellsworth. Synthetic Nitrogen Fertilizers Deplete Soil Nitrogen: A Global Dilemma for Sustainable Cereal Production. Journal of Environmental Quality. November 1, 2009. https://doi.org/10.2134/jeq2008.0527

[184] Ramaswamy, V., Boucher, O., Haigh, J., Hauglustaine, D., Haywood, J., Myhre, G., Nakajima, T., Shi, G.Y., and Solomon, S. Radiative forcing of climate change. p. 349–416. *In Climate change* 2001: The scientific basis. Cambridge Univ. Press, Cambridge, UK. 2001

[185] Shankman.

In addition, the decrease in soil pH with the use of ammonia extracts increases the need for liming. "CO_2 is produced when liming neutralizes soil acidity generated from nitrification."[186] The reduction of GHGs compared to industrial fertilizers is a positive aspect of organic farming.[187]

> While addressing the global warming outcomes, one should consider soil enzyme activities that may affect recalcitrant humic matter (Davidson, 2006) owing to their association with changes in temperature (Stott, 2010). The balance between these two competing processes determines how much C is sequestered and stabilized as well as contributing to microbial diversity and activity, and a host of enzyme properties that determine soil fertility and plant productivity (Powlson, 2011). Soil enzymes have significant association with temperature, moisture (Acosta-Martinez, 2004) (Dodor, 2005), soil porosity, and GHG emissions (Moelans, 2005).
>
> In comparison to manure addition, the application of INF [inorganic fertilizer, such as ammonia extracts] addition decreased the enzyme activities by limiting their energy and production by (i) decreasing the SOC [soil organic carbon], which is the energy source for soil microbial diversity and maintenance of their structure and functional capacity, (ii) declining the soil N content, which is the production source, and (iii) breaking down the soil aggregates. It is well known that soil physical and chemical environments are related to fertility and crop management systems, and are major determinants of microbial populations and activities (Garcia-Orenes, 2013). Manure increases SOM [soil organic matter], soil aggregation and N content, decreases soil bulk density and maintains the soil pH (Ozlu, 2018) those are beneficial in supporting soil microbial activities. The β-Glucosidase activity, which usually increased with the increase in soil microbial biomass, would reflect on a soil's ability to break down plant residues and improve the availability of nutrients for subsequent crops (Stott, 2010). More optimal soil water content combined with greater levels of organic C and N, nutrient cycling, and a large amount of N is stored in the relatively labile microbial biomass which is associated with greater microbial activity in manure amended soils (Goyal, 1999). Therefore, it is important to consider soil enzyme activities among the soil health indicators to provide a better understanding of microbial activities and C-N dynamics.[188]

The allowance of ammonia extracts and other highly soluble fertilizers promotes fraudulent "organic" operations.

Allowing potentially unlimited use of soluble nitrogen fertilizer would give an advantage to unscrupulous producers who substitute these inputs for the practices that define organic production.

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[186] R.L. Mulvaney, S.A. Khan, T.R. Ellsworth. Synthetic Nitrogen Fertilizers Deplete Soil Nitrogen: A Global Dilemma for Sustainable Cereal Production. Journal of Environmental Quality. November 1, 2009. https://doi.org/10.2134/jeq2008.0527

[187] Shade, J., Cattell Noll, L., Seufert, V., Galloway, J.N. and Erisman, J.W., *Decreasing reactive nitrogen losses in organic agricultural systems.* Organic Agriculture, pp.1-7.

[188] Ekrem Ozlu, Saroop S. Sandhu, Sandeep Kumar, Francisco J. Arriaga. *Soil health indicators impacted by long-term cattle manure and inorganic fertilizer application in a corn-soybean rotation of South Dakota.* Scientific Reports. (2019) 9:11776. https://doi.org/10.1038/s41598-019-48207-z

The California State Organic Program at the California Department of Food and Agriculture (CDFA) has stated that they have enough inspections at plants that through mass balance and unannounced inspections it would be very difficult for a manufacturer to mix in synthetic ammonia with nonsynthetic ammonia, but NOC remains skeptical that fraud can be prevented. Further, we understand that CDFA has noted that as long as you have a lot number and can obtain a sample of that lot for an isotopic analysis, you can then take a sample and do an isotopic analysis at the end user, and that ratio of C:N should not have changed. While some may find this well-reasoned, we share OMRI's concerns as noted in the published materials:

> While OMRI does not advocate for the allowance or prohibition of any specific material, it understands the risks of adulteration by synthetic substances to organic integrity. In the case of nonsynthetic ammonia sources, OMRI believes that the risk of adulteration by synthetic forms is significant due to the difficulties in identifying the sources of the material. The risk of adulteration is also higher for soluble nitrogen products given the potential economic gains from producing an input product with cheaper, synthetically derived nitrogen.[189]

The NOSB should create a work agenda item that focus on soil husbandry and a holistic approach to highly soluble sources of nitrogen.

Highly soluble sources of nitrogen cannot be addressed in a vacuum, and we cannot look at one material at a time. We must take a broader approach to limiting highly soluble sources of nitrogen as a whole. To evaluate and list each individually, even with a restriction, is a slippery slope and raises the concern of "stacking." Question #4 of the published materials effectively demonstrates this concern. It asks: "Should the use of natural ammonia extract be limited to a certain percent of nitrogen use in crops (similar to the Chilean nitrate restriction)?"[190] With this approach, producers could potentially "stack" highly soluble sources of nitrogen, using 20% of the crop's needs from Chilean nitrate, 20% of the crop's needs from another source, and 20% of the crop's needs from yet another source.

§205.203 *Soil fertility and crop nutrient management practice standard* mandates soil husbandry in organic production. While it is easy to focus on the negative aspects of highly soluble sources of nitrogen, we must go beyond that. In addition to the damage done, the use of highly soluble sources of nitrogen bypasses the benefits from the soil fertility and crop nutrient management practices outlined in §205.203.

Overreliance on highly soluble sources of fertility can short circuit soil-building practices that sequester carbon and is in violation of the foundational "feed the soil" principle in organic agriculture. Highly soluble sources of nitrogen should be included on the list of prohibited naturals (7 CFR § 205.602 of the National List), with the potential for an annotation limiting them based on an understanding of need during climatic emergency or extreme conditions. In concert with this, NOC encourages the NOSB to request a work agenda item related to carbon sequestration and enforcement of soil-health provisions in the organic regulations.

[189] NOSB April 2021 proposals and discussion documents. Page 57 of 172.
[190] *Ibid.* Page 57 of 172.

NOC believes the NOSB has an important role to play in solidifying organic's role as the gold standard for climate-friendly agriculture (priority #5 in our State of the USDA NOP comment). The organic regulations are strong because they require proper tillage, soil-building practices that sequester carbon, and pasture-based grazing for organic livestock. But the regulations are not being enforced as effectively as they should. There are several areas where enforcement must be strengthened, and new regulations should be put into place to ensure that organic is the gold standard when it comes to climate change.

The work agenda item focused on carbon sequestration and enforcement of soil-health provisions should focus on enforcement of soil-building, cover cropping, crop rotation, and biodiversity practices required in the organic regulations. The NOSB should identify and make recommendations to strengthen organic practices for climate mitigation, adaptation, and carbon sequestration. Such an effort would serve to bolster clarity and consistency of enforcement across certifiers, hold producers to foundational principles of organic production, and strengthen organic producers' position in the climate discussions and initiatives across the country.

The NOSB should address the related issue of other synthetic forms of ammonia.
During our discussion of ammonia extracts and soluble forms of nitrogen, a discussion arose regarding other synthetic forms of ammonia allowed by the National List, such as extractants. Specifically, the use of potassium hydroxide and ammonium hydroxide in the extraction of humic acid. Without an annotation that provides a threshold for use, excess extractant can be used in the manufacturer of these products, leaving them "fortified" with synthetic forms of ammonium or potassium.

An initial response is to suggest an annotation at §205.601(j)(3) Humic acids—naturally occurring deposits, water and alkali extracts only. *Solvent amount used is limited to that amount necessary for extraction*, similar to §205.601(j)(1). Indeed, this is the approach taken by the Canadian standards:[191]

> Humates, humic acid and fulvic acid
> Permitted if mined; produced through microbial activity; extracted by physical processes; or with:
> a) Table 4.2 Extractants; or
> b) potassium hydroxide—potassium hydroxide levels used in the extraction process shall not exceed the amount required for extraction.
> Levels (mg/kg) of arsenic, cadmium, chromium, lead and mercury shall not exceed the limits (category C1) specified in Guidelines for the Beneficial Use of Fertilising Residuals. Shall not cause a build-up of heavy metals or micronutrients in soil.

After reaching out to several MROs and a manufacturer, we came to better understand the manufacturing process and the fact that when extracting humic compounds or seaweed compounds, in theory there would be an exact amount required to achieve full extraction with no reactant left. However, this would only be achievable in a highly controlled lab setting. Because all raw leonardite or kelp meal materials vary in the amount of humic/alginic compounds in them, one would

[191] Government of Canada. Organic Production Systems. CAN/CGSB-32.311-2020. Corrigendum No.1, March 2021. Page 12 of 64. http://publications.gc.ca/collections/collection_2020/ongc-cgsb/P29-32-311-2020-eng.pdf

first have to do a very detailed analysis of each batch to ascertain how much product could be extracted from the raw materials.

Through this discussion, it came to our attention that the other caveat with these alkali extracted products is that the more that is used, the higher the pH of the end product. Excessively high pH products are unsafe for handling, and their residues on plants could be harmful if ingested; therefore, another approach that may address the overuse of extractants would be to set a pH threshold in the end product.

It is our understanding that OMRI has a fortification policy for humic acid extracts where potassium hydroxide or ammonium hydroxide are used as extractants that is applied anytime these allowed synthetic extractants are used in a product that applies for OMRI certification. If a product exceeds the threshold allowance of the OMRI policy, their application is forfeited and not prohibited by OMRI. The forfeit means a product has not met OMRI's internal standards, while still being allowed for use in organic production based on its listing on the NL.[192]

Conclusion
We urge you to approve this petition to prohibit the use of ammonia extracts in organic production.

NOC is requesting that the NOSB create a work agenda item that focuses on soil husbandry and a holistic approach to highly soluble sources of nitrogen. In concert with this, we urge the NOSB to create a work agenda item related to carbon sequestration and enforcement of soil-health provisions in the organic regulations.

The NOSB should address the related issue of other synthetic forms of ammonia.

[192] Private e-mail communication between Doug Currier, OMRI, and Christie Badger, NOC.

Appendix C

NOC Racial Equity Comments – Spring 2021

The 2017 Ag Census data shows that people of color are underrepresented in farming, including organic farming. For example, while over 13% of the US population identifies as Black or African American, fewer 1.4% of all farms in the U.S. are owned by Black or African American farm owners. 98% of agricultural land is owned by white landowners.[193] **According to 2017 ag census data, although organic farmers are slightly "more diverse" than conventional farmers (94% of conventional farmers and, 92% of organic farmers identify as white), fewer than 1% of organic farmers identified as Black or African American, and 0.5% identified as American Indian or Alaska Native.[194]**

We recognize that access to the organic movement and organic certification has not been equal across racial groups. Systemic racism has kept our movement from reaching its full potential. The organic movement can only be stronger and better positioned to meet future challenges if it represents diverse participation. Attached in Appendix B is NOC's statement on Racial Equity. This statement is a "living" statement, and will be amended as we grow in our understanding. We also share our NOC Racial Equity in Organic Resource Page,[195] with resources collected with the help of many individuals and organizations.

NOC acknowledges our own privilege as a primarily white-led coalition, and is committed to prioritizing racial equity in our organization and strategies. NOC is committed to listening, understanding, learning, amplifying, working, and acting to address and dismantle systemic racism. We are holding ourselves accountable to ensure this is a deep, long term, and sustainable commitment.

We urge the NOSB to explore ways to encourage the NOP and organic stakeholders to expand their work and resources to further address this issue. Following are some concrete steps NOC believes the NOSB can take to move towards an equitable organic system.

First, through a preliminary literature review, NOC identified access to land, resources, and technical assistance as some of the main barriers to participation in organic agriculture for Black, Indigenous, and people of color (BIPOC) farmers.

1. **Access to land.** Land ownership and control over land is important for organic certification because organic operations must demonstrate that their land has been free of prohibited substances for a three-year period before crops can be harvested and sold as organic. In

[193] Racial, ethnic and gender inequities in farmland ownership and farming in the U.S. Agricultural and Human Values 36 (2019)
https://link.springer.com/article/10.1007/s10460-018-9883-3
[194] 2017 Census of Agriculture: Characteristics of All Farms and Farms with Organic Sales, April 2019, United States Department of Agriculture, National Agricultural Statistical Service
https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Organics_Tabulation/organictab.pdf
[195] NOC Racial Equity Resources
https://docs.google.com/document/d/1ncYsoIj503oBCqVd4zZ9C2ta5I1GvoozCJB2u7WdZoE/edit#heading=h.gjdgxs

addition, land must have distinct and defined boundaries and buffer zones to prevent contact with prohibited substances. For these reasons, it is important to understand how BIPOC farmers have been dispossessed of land and the impact that has on their participation in organic certification.

a. **Stolen land.** From the birth of our country to today, the United States Government seized 1.5 billion acres of native land. "As late as 1750—some 150 years after Britain established Jamestown and fully 250 years after Europeans first set foot in the continent—[Native Americans] constituted a majority of the population in North America […] Even a century later, in 1850, they still retained formal possession of much of the western half of the continent."[196] The 1887 General Allotment Act and 1906 Burke Act directly led to the loss of 90 million acres of Native American land.[197] The Morrill Act of 1862 worked by turning land expropriated from tribal nations into seed money for higher education. "Today, the vast majority of agricultural lands on reservations are leased to non-Indian ranchers, often at less than fair-market value. In addition, income from these lands goes off the reservation instead of to the Indian landowners who experience high rates of unemployment and often live in poor economic conditions.[4] According to the Bureau of Indian Affairs (BIA), the federal government holds about 46 million acres in trust for tribes (tribal trust land) and more than 10 million acres in trust for individual Indians (individual trust land).[198] The loss of tribal lands combined with the mixed ownership patterns within reservation boundaries poses serious challenges to the sovereignty and self-determination of Indian nations."[199]

b. **Black farmer dispossession.** In 1910, one in seven farmers were African Americans and African Americans held titles to approximately 16 to 19 million acres of farmland. Over the next century, 98% of Black farmers were dispossessed through discriminatory practices at USDA and various federal programs. These farmers were often denied loans and credit, lacked access to legal defense against fraud, and experienced "outright acts of violence and intimidation" resulting in a 90% loss of Black-owned farmland in the US.[200] Today, 98% of private rural land is owned by white people, while less than 1% is Black-owned. The USDA's systemic bias against Black and minority farmers is well documented and affirmed by the 2010 Pigford vs. Glickman class action lawsuit, which resulted in a $1.25 billion settlement. Black farmers continue to experience discrimination in access to credit, seeds, and other assistance, and face foreclosure at six

[196] Watch how the U.S. Stole Land from Native Americans https://www.fastcompany.com/3040647/watch-how-the-us-stole-land-from-native-americans
[197] Indian Land Tenure Foundation https://iltf.org/land-issues/issues/
[198] Indian Issues, Agricultural Credit Needs and Barriers to Lending on Tribal Lands https://www.gao.gov/assets/700/699019.pdf
[199] High Country News, Land Grab Universities (March 2020) https://www.hcn.org/issues/52.4/indigenous-affairs-education-land-grab-universities
[200] Data for Progress: Land Access for Beginning and Disadvantaged Farmers https://filesforprogress.org/memos/land_access_for_beginning_disadvantaged_farmers.pdf

times the rate of their White counterparts.[201] On March 25, 2021, an historic hearing convened by the House Agriculture Committee reviewed the "State of Black Farmers in the US." The hearing focused on the systemic discrimination Black farmers face and opportunities for USDA to take action to address the needs of Black farmers. Some of the suggested actions included targeted outreach and technical assistance to historically underserved farmers, appropriate and representative staffing at USDA agencies such as FSA, NRCS, and on committees, and partnering with local organizations that have built trust and proven track records of success.[202]

c. **Most of the agricultural land in the US is owned by white landowners**. "Organic farming is almost a mirror reflection of the mainstream food system in organic farm ownership and operation. As a result, conversations in the organic community are centered on the understandings of white landowners and their understandings of their land holdings, farming practices, and an anthropocentric worldview."[203] This needs to be taken into consideration when reviewing rules and regulations pertaining to organic certification: what barriers are inherent in organic rules and regulations because of how land ownership and access is assumed?

Some of the recommendations addressing land access issues proposed by organizations (Data for Progress,[204] Soul Fire Farm,[205] National Young Farmers Coalition) and independent experts include the following:

a. Conduct research on land ownership and exclusion of BIPOC farmers in land ownership.
b. Strengthen loan guarantees, improved access to credit and technical assistance for BIPOC and beginning farmers.
c. Expand FSA grant and loan guarantee programs (such as the Highly Fractionated Indian Land Loan Program and Indian Tribal Land Acquisition Loan Program) for land acquisition for beginning and socially disadvantaged farmers under sustainable agriculture covenants. Establish lending guidelines for the Small Business Administration (SBA) and private loans to low-income resident farmers and BIPOC-led farmer cooperatives.
d. Earmark funds for down-payment assistance and financial support grants for new farms practicing sustainable agriculture through the first 10 years of operation.
e. Implement robust anti-discrimination guidelines and oversight of USDA practices.

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[201] Vann R. Newkirk III, "The Great Land Robbery," The Atlantic, September 2019. https://www.theatlantic.com/magazine/archive/2019/09/this-land-was-our-land/594742/

[202] A recording of this hearing and witness testimonies are available here: https://agriculture.house.gov/calendar/eventsingle.aspx?EventID=2141

[203] How diverse is the organic movement, and how do we improve access? A-dae Romero-Briones (2020) https://rodaleinstitute.org/blog/how-diverse-is-the-organic-movement/

[204] *Memo: Land Access for Beginning and Disadvantaged Farmers,* Data for Progress, March 2020 https://www.dataforprogress.org/memos/land-access-for-beginning-disadvantaged-farmers

[205] Soul Fire Farm & Northeast Farmers of Color alliance – Food Sovereignty Action Steps (2018) https://docs.google.com/document/d/1dt0hicyhGdJSKlC3qyE1AbG9fdDrONjUh_M_bE0KMGs/edit#bookmark=id.rji88dqczea2

f. Appoint a USDA-led "land commission" to conduct a periodic national-scale land tenure study to provide a holistic perspective on socio-economic, political, and market-based factors limiting BIPOC access to land.

2. Access to information. Similar discriminatory practices have led to an unequal distribution of technical assistance. Some recommendations include:
    a. Expand funding and training for organic agriculture.
    b. Increase funding for the USDA Conservation Programs, specifically the Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP), and Conservation Stewardship Program (CSP), with increased on-ground staff and technical assistance capacity to successfully service their regions.
    c. Ensure adequate training and information dissemination among FSA and NRCS staff at the county level regarding existing opportunities to support beginning farmers, such as the EQIP Advanced Payment Option for historically underserved producers.[206]
    d. Eliminate match requirement for USDA's Beginning Farmer and Rancher Development Program (BFRDP) grant awardees to ensure that all organizations and service providers can best train the next generation, particularly in areas of high need and low resources.
    e. Support programs such as the Federally Recognized Tribal Extension Program which provides competitive grants to tribal extension programs that enhance tribal farming and ranching operations.

Second, on October 26, 2020, NOC hosted a virtual "pre NOSB meeting" which included a breakout session on barriers to certification for farmers of color. This group of 40 organic advocates identified seven ways to make organic certification more equitable. These strategies are outlined below.

1. **Make information, training, and technical assistance more accessible.** This includes increased targeted outreach, technical assistance, opportunities and support to BIPOC farmers from USDA and certifying agencies. It also means considering where BIPOC farmers are located and bringing the resources there. Finally, it means that educational resources and regulations should be easily available in languages relevant to all farmers.

    NOSB role – continue to encourage the NOP to make materials available in languages other than English.

2. **Reflecting on the certification process**. Because of the history of discrimination from agencies such as USDA, there is a justified distrust of the agency. Partnering with local organizations to help support completion of necessary paperwork and administrative process might encourage a more diverse participation in the process.

[206] EQIP Advance Payment Option
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/eqip/?cid=nrcseprd1502414

3. **Organic policies.** The group discussed policies, programs, and legislation that could encourage a more equitable support of organic farmers. This might include specific set asides for BIPOC farmers, increasing the reimbursement rate for the certification cost share program, and finally, encourage the certification of grower groups. On the consumer side, we know access to organic foods, which often come at a higher price, are not accessible by all. "Currently, organic products are not eligible for federal procurement in many institutional programs, effectively excluding access to the organic community by virtue of income—often excluding Black, Brown, or Indigenous people."[207] Including provisions for procurement of organic products in programs such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC),[208] which serves low income women, infants, and children up to age five, would expand access to organic food and nourish some of our nation's most vulnerable populations.

4. **Reallocating money and power.** It is obvious, if only by looking at the makeup of NOSB meeting attendees, that the organic community is not very diverse. In addition to discussing how specific programs and policies could make organic agriculture more equitable, the group discussed structural changes to make our community more representative—this includes transferring leadership to BIPOC communities, amplifying BIPOC voices, and encouraging USDA to increase diversity in staffing and advisory boards.

5. **Acknowledge context, history, and contributions of BIPOC farmers** to the organic movement. Our movement needs to not only acknowledge past and current issues of systemic discrimination, but also reframe what has been portrayed as a very white-centered history of organic agriculture, acknowledging the contributions of organic pioneers such as George Washington Carver, Booker T. Whatley, and the historical practices of multiple indigenous groups. This inclusive historical narrative of organic agriculture should be provided on prominent public space such as the USDA website.

6. **Training and recruitment for organic certification staff**. Recruiting and training BIPOC certifiers and inspectors.

7. **Support BIPOC farmers in accessing & keeping land**. The group recognized access to land and capital as one of the primary barriers to organic farming. The organic community should acknowledge this challenge common to all new and beginning farmers, and the specific barriers related to land access for BIPOC farmers.

NOSB Recommendations

In light of the barriers explored above, NOC is making the following recommendations to the NOSB.

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[207] A-dae Romero-Briones. Organic Farmers Association. *Bringing Equity to Organic.* November 2020. https://organicfarmersassociation.org/news/bringing-equity-to-organic/#:~:text=Currently%2C%20organic%20products%20are%20not,consumer%20is%20most%20likely%20white

[208] The Truth Behind WIC: Organic is NOT an Option! https://www.organicconsumers.org/news/truth-behind-wic-organic-not-option

1. **Research**

A first step to addressing disparities in representation is understanding the source of these disparities and underrepresentation. NOC encourages the NOSB to prioritize research into **understanding barriers to participation in organic certification for farmers of color**. This research should include continual learning and understanding of institutions that have perpetuated centuries of discrimination and provide relevant information to support the actions of USDA's Office of the Assistant Secretary for Civil Rights. Research into barriers to participation in organic certification should also support the development of technical assistance and outreach specifically designed to best serve BIPOC farmers and the unique challenges they face.

NOC also supports a research priority area suggested in Union of Concerned Scientists' Policy Brief of May 2020, to develop "markets for ethnic specialty crops and culturally relevant fruits and vegetables, leveraging the skills of immigrant and refugee farmers, helping them thrive while also contributing to local economies."[209] NOC also supports reexamining the national organic marketplace to support organic small farms, inclusive of Black and Indigenous small farmers.

Finally, NOC supports research to limit and avoid the contamination of Black and Indigenous farmlands and conservation lands by off-farm sources and neighboring farms.

2. **Technical assistance**

Technical assistance and outreach must serve farmers of color, recognizing traditional ecological knowledge and management as best practices. The contributions made by BIPOC individuals and communities to organic and sustainable food systems are vast and often go unacknowledged. NOC encourages the NOSB to recommend that USDA support investment in community programs offering materials in multiple languages and formats, providing translation assistance, and streamlined paperwork.

NOC also encourages the NOSB to recommend that the NOP reenergize previous outreach and education efforts on organic agriculture, with a specific focus on outreach to socially disadvantaged groups and ensuring this information is accessible (language, where the information is found, dissemination strategies, etc.). Examples of such previously existing programs include:

- The "Sound and Sensible Initiative," identifying and removing barriers to certification, streamlining the certification process, focusing enforcement, and working with farmers and processors to correct small issues before they become larger ones, with the overall goal to make organic certification accessible, attainable, and affordable for all operations.

- "Organic 101" series,[210] a USDA blog post series that explored different aspects of the USDA organic regulations in a digestible format.

[209] (May 2020) Union of Concerned Scientist & HEAL Food Alliance Policy Brief https://www.ucsusa.org/sites/default/files/2020-06/leveling-the-fields.pdf

[210] Organic 101: Five Steps to Organic Certification, USDA blog, February 2017 https://www.usda.gov/media/blog/2012/10/10/organic-101-five-steps-organic-certification

- The Organic Integrity Learning Center. This resource could be widely promoted and made available to farmers. Modules could include farmer-focused lessons on organic transition, the organic certification and inspection processes, and common practices required in organic production, but which sometimes pose challenges for organic producers, such as cover cropping, crop rotation, and organic weed management.

For the outreach and support to be truly relevant, we encourage the NOSB to support the hiring of linguistically and culturally competent representatives both at the certifier level and at the agency level (USDA NOP, FSA, NRCS, and other USDA agencies). We also encourage the NOSB to support partnerships with local organizations that have high levels of trust with local communities.

3. Equity of Infrastructure and Information

The "NOP Documents and Resources Available in Spanish" page links to a copy of the regulations in English.[211] Creating an inclusive movement requires that materials be available in other languages. We understand that some certifiers, such as CCOF, have translated the regulations into Spanish, and would suggest that the NOP contract with CCOF or another entity to provide access to the translated materials on the NOP's website. NOC encourages the NOSB to work with the NOP to identify languages that the organic materials should be translated into, and then work to identify the appropriate means of acquiring those translated materials.

Furthermore, as outlined by NOSB member A-dae Romero-Briones in an insightful article for the fall 2020 issue of Organic Farmers Association's New Farms Magazine,[212] grower group certification could create a path to infrastructure development for not only many Indigenous and Tribal growers, but for marginalized small-scale growers as well. "*Domestic organic certifiers site lack of guidance on applicability to livestock or produce, limitations of number of growers within the group, and inspection expectation of grower members as some of the reasons there is reluctance to certify grower groups.*" NOC encourages the NOSB to consider looking closely at grower groups and their capacity to increase organic certification for BIPOC farmers.

4. Representation and Leadership

Appropriate and relevant representation is necessary to reach a truly equitable system. NOC encourages the NOSB to foster leadership of BIPOC participants in decision-making venues, including grant panels, advisory boards, and committees.

For example, the NOSB could recommend that:

- USDA create an Office of Equity to review policy proposals and mandate BIPOC participation on USDA decision-making boards.

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[211] NOP Documents and Resources Available in Spanish, https://www.ams.usda.gov/sites/default/files/media/NOPDocumentsandResourcesAvailableinSpanish.pdf

[212] A-dae Romero-Briones. Organic Farmers Association. *Bringing Equity to Organic.* November 2020. https://organicfarmersassociation.org/news/bringing-equity-to-organic/#:~:text=Currently%2C%20organic%20products%20are%20not,consumer%20is%20most%20likely%20white

- USDA empower the new office to legally address claims of discrimination in agricultural credit, land credit and markets, and conduct oversight of USDA practices.
- USDA examine the role of heirs property in the loss of land for Black farmers, and offer education and technical assistance for families to retain property.[213, 214]

The NOSB could also consult with federal advisory committees and organizations representing BIPOC farmers, such as the Native American Farmers and Ranchers Federal Advisory Committee, on issues related to organic agriculture, organic standards, and BIPOC participation in organic certification.

"A truly sustainable food system must be both science-based and equitable" (Union of Concerned Scientists & HEAL Alliance, 2020).[215]

[213] *Memo: Land Access for Beginning and Disadvantaged Farmers,* Data for Progress, March 2020 https://www.dataforprogress.org/memos/land-access-for-beginning-disadvantaged-farmers
[214] *Leveling the Fields, Creating Farming Opportunities for Black People, Indigenous People, and Other People of Color,* Union of Concerned Scientist, HEAL Food Alliance, May 2020, https://landstewardshipproject.org/repository/1/3245/leveling_the_fields_final.pdf
[215] *Ibid.*

Appendix D

Clarity on 3-Year Transition Period – NOC Fall 2020 NOSB Comments

In August and September of 2020, the Accredited Certifiers Association, Organic Farmers Association, and NOC partnered to conduct a survey with certifiers on certifier policies regarding the circumstances under which they require a three-year transition period after the spraying of a prohibited substance.

The goals of this survey are to:

1. Inform the work of the ACA's working group, which is focused on the *June 3rd, 2019 NOP memo on Land based Production affecting Greenhouse and Container Production*.[216] The working group intends to begin creating guidelines in the coming weeks and months to address inconsistencies and identify best practices in three-year transition period requirements.
2. Use the aggregated data we have collected to inform the National Organic Program and NOSB, identify where there is a lack of uniform interpretation, and request their review and clarification.
3. Ultimately the goal of the survey is to bring all certifiers into alignment in this area so that together they uphold high organic integrity and provide uniform interpretation of the organic standards.

34 certifying agents participated in the survey. This represents about 44% of NOP accrediting certifying agents and 54% of ACA's membership.

The survey results demonstrate the high level of variation between certifiers in how they apply the three-year transition requirement in different situations. The survey results are attached in aggregate form as Attachment A.

There was certifier consistency for only one scenario presented in the survey. The survey results indicate that all certifier respondents require a three-year transition period after the application of prohibited substance in a greenhouse or hoop house that is growing crops in the ground.

NOC's preliminary analysis indicates that for other situations, certifiers were either evenly split or most certifiers, but not all, followed the same practices with notable outliers. Some certifiers indicated "other" for some scenarios and described various circumstances under which they would either require or not require a transition period.

In the following scenarios, certifiers were split evenly between requiring a three-year transition period and not requiring a transition period:

1. After the application of prohibited substance in a greenhouse or hoop house with a permeable floor (i.e. soil, sod, rocks, plastic, fabric, etc.) that is growing crops in containers on tables or benches.

[216] https://www.ams.usda.gov/sites/default/files/media/2019-Certifiers-Container-Crops.pdf

2. After the application of prohibited substance in a greenhouse or hoop house that is growing crops hydroponically or with an aquaponic system. Most certifier respondents (61.3%) do not certify these systems at all, but for those who do, there is a lack of clarity on this issue.
3. After the application of prohibited substance inside an indoor facility that is growing crops hydroponically or with an aquaponic system. Most certifier respondents (61.3%) do not certify these systems at all, but for those who do, there is a lack of clarity on this issue.

Based on the survey results, the three above scenarios are situations for which there is a high level of inconsistency and no clear consensus among certifiers. As a result, providing clarity in these three situations should be a high priority for the NOP, NOSB, and the organic community. NOC believes further deliberation must take place to develop consensus within the organic community.

The following scenarios are ones in which *most* certifier respondents require a three-year transition, but for many of these situations there is a noteworthy minority of certifiers who do not require the transition period. Some certifiers responded "other" to indicate that they do not require the three-year transition uniformly for these scenarios:

1. After the application of a prohibited substance in a greenhouse or hoop house that has a permeable floor (i.e. soil, sod, rocks, plastic, fabric, etc.) and is growing transplants (grown on the ground, on pallets, on tables or benches) – 66.7% of certifier respondents require a three-year transition.
2. After the application of prohibited substance in a greenhouse or hoop house that is growing crops in containers on the ground or on a permeable ground covering (i.e. soil, sod, rocks, plastic, fabric, etc.) – 87.1% of certifier respondents require a three-year transition.
3. On the land upon which poultry houses are located after the application of a prohibited substance if the poultry house has a permeable floor (i.e. dirt or other) – 83.3% of certifier respondents require a three-year transition.
4. For the outdoor access area for a poultry house after the application of a prohibited substance – 90% of certifier respondents require a three-year transition.

The following scenarios are ones in which *most* certifier respondents do not require a three-year transition, but for many of these situations there is a noteworthy minority of certifiers who do require the transition period. For many certifiers, the presence of an impermeable floor is a key factor. Some certifiers responded "other" to indicate that they do not require the three-year transition uniformly for these scenarios, but do sometimes require it depending on circumstances (for example):

1. After the application of prohibited substance in a greenhouse or hoop house that has an impermeable (i.e., concrete, etc.) floor and is growing transplants (grown on the ground, on pallets, on tables or benches) – 57.6% of certifier respondents do not require a three-year transition.
2. After the application of prohibited substance in a greenhouse or hoop house that is growing crops in containers on an impermeable ground (i.e., concrete, etc.) – 61.3% of certifier respondents do not require a three-year transition.

3. After the application of prohibited substance in a greenhouse or hoop house with an impermeable floor (i.e. concrete, etc.) that is growing crops in containers on tables or benches – 64.5% of certifier respondents do not require a three-year transition.
4. After the application of prohibited substance inside an indoor facility that is producing crops in containers – 58.1% of certifier respondents do not require a three-year transition.
5. After the application of prohibited substance inside an indoor facility that is producing transplants – 58.1% of certifier respondents do not require a three-year transition.
6. After the application of prohibited substance inside an indoor facility that is producing mushrooms – 58.1% of certifier respondents do not require a three-year transition.
7. After the application of prohibited substance inside a greenhouse or an indoor facility that is producing sprouts – 58.1% of certifier respondents do not require a three-year transition.
8. On the land upon which poultry houses are located after the application of a prohibited substance if the poultry house has an impermeable floor (i.e. concrete or other) – 60% of certifier respondents do not require a three-year transition.

In our survey, we also asked respondents if they would allow operations with greenhouses or facilities that produce both conventional and organic crops, transplants, or planting stock simultaneously within the same greenhouse or facility to become certified as organic. For example, if someone put up a wall to separate conventional and organic production within the greenhouse, we asked certifiers to indicate if they would you allow this greenhouse to become certified. 74.2% of certifier respondents indicated that they do allow this situation.

We also asked survey respondents if they would allow operations with greenhouses or facilities that produce both conventional and organic crops, transplants, or planting stock not simultaneously but within the same greenhouse or facility to become certified as organic. 67.7% of certifier respondents indicated that they would allow this situation.

Finally, 56.7% of certifier respondents would allow poultry operations that raise both conventional and organic chickens simultaneously or not simultaneously within the same facility to become certified as organic.

The survey results indicate that very few certifier respondents have standard definitions for the following terms: Greenhouse, Hoop house, Facility. 84.6% do not have any standard definitions. NOC believes clearly defining these different types of production structures would be helpful in providing clarity about which situations require a three-year transition after a prohibited substance is sprayed.

Request for Clarity

We appreciate the memo dated June 3, 2019, explaining to certifiers the rules they must follow to determine eligibility and compliance for container systems that receive organic crop certification.[217] In its memo, the NOP uses the term "container system" to include container, hydroponic, and other plant pot-based systems (with or without soil as a growing media). NOC appreciates the clear statement from the NOP that these systems must undergo a three-year transition period. We understand that up until

[217] https://www.ams.usda.gov/sites/default/files/media/2019-Certifiers-Container-Crops.pdf

that point, some certifiers had been certifying container systems without requiring a three-year transition from the last application of a prohibited substance, so this clarification was urgently needed to ensure the integrity of the organic program.

As the survey results indicate, however, this memo left a lack of clarity regarding how it applies to crop production in greenhouses and facilities. While some organic certifiers and certified producers read the memo to include crop production in greenhouses and facilities under the three-year transition requirement, other organic certifiers and certified producers read the memo to not require greenhouse operations and facilities that produce crops to comply with the three-year transition requirement.

As climate change challenges organic producers to establish new production technologies and the organic market continues to grow at a rapid pace, greenhouse production is estimated to increase. We must, as an organic community, regulate and enforce organic greenhouse production under uniform national standards. When there are important differences in interpretation that have economic consequences for producers, we need clarity from the National Organic Program to make sure the USDA and accredited certifiers are working together to enforce the standards, ensuring a level playing field for producers, and protecting consumer confidence in the integrity of the USDA Organic Seal.

The current disparity of interpretation for a three-year transition is inhibiting the National Organic Program's ability to provide consistent and fair enforcement, leaving our nation's organic standards unfair and inconsistent.

The NOP must clarify the requirement for a three-year transition for crop production in greenhouses and facilities after the application of a prohibited substance. **The NOSB should actively engage in this process by requesting a work agenda item, requesting stakeholder input, making recommendations to the NOP, and by asking the NOP to provide clarity so all certifiers and organic operations are held to the same standard.**

Appendix E

NOC Biodegradable biobased mulch annotation change comments

§205.601 Synthetic substances allowed for use in organic crop production.
(iii) Biodegradable biobased mulch film as defined in §205.2. Must be produced without organisms or feedstock derived from excluded methods. ***When 100% biobased biodegradable plastic films become available, producers are required to use 100% biobased content BDM plastic films.***

§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

Biodegradable plastic mulch films m*ust be *at least 80% biobased with content determined using ASTM D6866 (incorporated by reference; see §205.3).

NOC acknowledges that a biodegradable biobased mulch (BDM) film would be a great asset to producers; however, we continue to harbor great concerns regarding the agronomic, environmental, and health effects of the breakdown and subsequent incorporation into the soil. We do not feel that these concerns have been addressed adequately at this time. Frankly, these concerns cannot be addressed adequately until further research is done in a more long-term manner.

Biodegradability must be considered in a very broad way.
Biodegradability must be shown across many regions, soil types, and climate types. Requiring a material to be biodegradable does not make it so, as demonstrated by field testing done by Dr. Narayan, author of the study on biodegradable biobased mulch films commissioned by the NOP. In attempting to demonstrate that the use of BDM is superior to polyethylene (PE) mulch, he uses a scenario where the BDM will biodegrade completely under conditions that would be impossible to replicate in a real-life situation.[218]

Biodegradable plastic mulches must be thoroughly investigated to ensure they are safe and sustainable for use in agricultural systems. If biodegradable plastic mulches are to be tilled into the soil after use, their complete breakdown needs to be ensured and verified under the wide variety of soils and environments where they may be applied. Global use of plastic mulch is high and is increasing, thus

[218] Ramani Narayan. "Biodegradable Biobased Mulch Films in Organic Cropping Systems." September 2019. Page 4 of 21.

there is a growing market for biodegradable plastic mulches. Incomplete breakdown of biodegradable plastic, however, could lead to an accumulation of plastic fragments and particulates in soils.[219]

To adequately regulate BDM, Materials Review Organizations (MROs) should review and list specific BDM materials. In addition, certifiers should verify that biodegradation is taking place in the local situation on the certified farm. We recognize that certifiers do not have the expertise to assess biodegradation of microscopic or molecular residuals, but we feel they should at least verify that visible pieces of the material (mulch film fragments) are not persistent in the soil after a year. When BDM makes it into organic production, detailed questions regarding use, biodegradation, and soil conditions should become a part of the organic system plan (OSP), with inspectors providing feedback of visual observations.

Synthetic materials must meet all of the OFPA criteria.
As noted in the memorandum from Jennifer Tucker Ph.D. to the NOSB dated October 16, 2019, the NOP "determined that Policy Memorandum 15-1 (January 22, 2015) did not present new information or impose additional requirements compared to the 2014 final rule"[220] on biodegradable biobased mulch films in organic crop production. We thank the NOP for acknowledging that the 2014 rule and preamble establish the requirement that all polymer feedstock be 100% biobased. We fully agree.

Synthetic substances are allowed as per 205.601, provided they meet OFPA criteria, including that they do not contribute to contamination of crops, soil, or water.
The crops subcommittee in its published materials notes:

> "An argument can be made that even though the non-biobased polymers degrading into the soil originate from petroleum (a nonrenewable fossil fuel), the use of this product could be considered environmentally friendly because:
>
> - Many organic production systems rely on enormous amounts of plastic, mostly polyethylene(PE) films, to produce organic crops;
> - PE films likely shed micro plastics and leach chemicals into organic soil over the growing season;
> - Before and during removal, PE films can tear and breakdown, leaving plastic in the soils or migrating off-site into aquatic habitats;
> - PE films are generally not recyclable due to contamination by soils or the lack of recycling infrastructure;
> - Plastic used in annual production systems end up in landfills;

[219] Henry Y. Sintim and Markus Flury, "Is Biodegradable Plastic Mulch the Solution to Agriculture's Plastic Problem?" Environmental Science & Technology. 2017, 51, 1068-1069.
[220] "Biodegradable Biobased Mulch Film" Memorandum to the National Organic Standards Board from Jennifer Tucker, Ph.D., October 16, 2019.

- Biodegradable mulches potentially save labor and time, since the mulch does not have to be removed from the field and transported for disposal."[221]

On the other hand, one might argue that the ability to remove the plastic mulch at the end of the growing season offers a measure of control that would not be present with the partially biodegraded mulch film, which the grower does not even try to remove from the field. While synthetic substances are allowed as per §205.601 provided they meet OFPA criteria, including that they do not contribute to contamination of crops, soil, or water, micro- or nano particles could be produced in the degradation of the biodegradable biobased mulch film, potentially contaminating crops, soil, and/or water. Do we really want to trade removing plastic to guarantee that we are leaving microplastic behind?

Further, most of the bullet points listed above could be used as arguments against BDM. As noted previously, the global use of plastic mulch is high and is increasing, thus there is a growing market for biodegradable plastic mulches. Incomplete breakdown of biodegradable plastic, however, could lead to an accumulation of plastic fragments and particulates in soils.[222] Indeed, one of our committee members had the opportunity to visit the site in Tennessee where BDM was being tested, sharing that with visual observation alone it was apparent that the material was breaking apart and blowing across the field to be caught in the tree line.

> Another important consideration when measuring the amount of mulch remaining in the soil is mulch particles that are too small to see. Although measuring mulch surface area loss in field studies can provide a benchmark measurement for the biodegradation potential of a mulch product, it does not take into account the possibility that microfragments, nanofragments, or both persist in the soil (Rillig, 2012; Steinmetz et al., 2016). Recent work has focused on developing methods to detect microplastics in environmental samples (D€umichen et al., 2015; Majewsky et al., 2016), and these techniques could possibly be helpful to more accurately determine the amounts of mulch remaining after soil incorporation.[223]

Dr. Narayan, author of the study on biodegradable biobased mulch films commissioned by the NOP, further notes:

> "This accumulation of recalcitrant [polyethylene] PE mulch film fragments in agricultural soils around the world is cause for alarm because it decreases soil productivity by blocking water infiltration, impedes soil gas exchange, constrains root growth, and alters soil microbial community structures (3, 9). Plastic pollution of soils is also a threat to soil ecosystem health and function (10-12). PE micro fragments dispersed in soil and water readily absorb and concentrate toxins present in the environment (much like a sponge). Microorganisms colonize these

[221] NOSB April 2021 proposals and discussion documents. Page 18 of 172.
[222] Henry Y. Sintim and Markus Flury, "Is Biodegradable Plastic Mulch the Solution to Agriculture's Plastic Problem?" Environmental Science & Technology. 2017, 51, 1068-1069.
[223] Miles et al. "Reliability of Soil Sampling Method to Assess Visible Biodegradable Mulch Fragments Remaining in the Field After Soil Incorporation." 2017

> fragments, and the birds and fishes eat them because they think it is food. This results in toxins and PE micro fragments being transported up the food chain (13)."[224]

We submit that the same could be said of biodegradable mulch film fragments. While Dr. Narayan offers his solution "to use completely soil-biodegradable mulch films that retain the performance characteristics of PE films but at the end-of-life can be plowed into the soil or recovered for on-farm composting" and attempts to demonstrate this in Scheme 1 in his paper, there are issues with his demonstration. Most obviously, the suggestion that the biodegradable mulch film would break down completely within 24 months of soil temperatures of approximately 25°C (77°F). What is the real-life situation where this would be the case? Further, how many years in the field would it take for complete degradation in less-than-ideal situations, especially the cold soils of the northern regions of our country?

Within the published materials it is noted that most of Dr. Narayan's report "focused on the positive aspects when mulch does biodegrade."[225] We would like to be clear in stating that while this may be the case, these "positive aspects when mulch does biodegrade" were under unachievable real-life conditions.

The crops subcommittee notes:

> Key concerns of current and past NOSB members include the possibility of soil, aquatic, and other environmental contamination by partially decomposed BDM films even if the materials pass ASTM laboratory-based standards. Of particular concern to NOSB members is the possibility that BDM films will not decompose thoroughly in dry or cold environments where there is less biological activity in soils. A related concern is that BDM films ploughed into soils may be out of reach of peak biological activity tobreak it down.[226]

NOC shares these concerns. "Although laboratory tests can assess the potential of a mulch product to biodegrade under certain conditions (ASTM International, 2012), results may vary widely under field conditions."[227]

> In theory, BDMs should be completely catabolized by soil microorganisms, converted to microbial biomass, CO2 and water (Malinconico et al., 2002; Feuilloley et al., 2005; Imam et al., 2005; Dintcheva and La Mantia, 2007; Kyrikou and Briassoulis, 2007; Kijchavengkul et al., 2008; Lucas et al., 2008). In practice, complete breakdown in a reasonable amount of time is not always observed (Li et al., 2014b). Regulators and growers cite concerns about unpredictable or incomplete breakdown and the ultimate fate of BDM constituents and their effect on soil ecosystems (Goldberger et al., 2015; Miles et al., 2017).[228]

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[224] Ramani Narayan. "Biodegradable Biobased Mulch Films in Organic Cropping Systems." September 2019. Page 4 of 21.
[225] NOSB April 2021 proposals and discussion documents. Page 19 of 172.
[226] *Ibid.* Page 19 of 172.
[227] Miles et. al., 2017
[228] Bandopadhyay Sreejata, Martin-Closas Lluis, Pelacho Ana M., DeBruyn Jennifer M. "Biodegradable Plastic Mulch Films: Impacts on Soil Microbial Communities and Ecosystem Functions." *Frontiers in Microbiology*, Volume 9, 2018, Page 819.

"Currently, there is no established field method to measure the amount of BDM remaining in the soil after incorporation."[229] The impacts of BDM that does not degrade on soil and plant health is also unknown, but there is cause for concern.

> Traditional plant tests for toxicity have not been adapted to identify effects of compounds released from BDMs. First, different compounds are released at different times during the biodegradation process. Second, frequently used tests fail to reckon the changing needs and responses throughout plant development by only focusing on germination. Finally, the diversity of plant responses in the ecosystem is narrowly represented by tests that analyze early growth in a few, mostly vigorous, plant species. Despite these constraints, some effects have emerged. A phytotoxicity test of several chemicals used in bioplastics found that some exhibited a concentration-dependent inhibition of plant growth (Martin-Closas et al., 2014). Acrylate polymers used to maintain soil humidity damaged maize root and shoot development (Chen et al., 2016). Organic compounds released from mulch polymers have been found to be absorbed by crop plants (Du et al., 2009; Li et al., 2014c; Chen N. et al., 2017). Given some of the demonstrated effects on plants, these additives may also impact soil microbes and their functions, though these effects are largely unexplored.[230]

"[F]urther research is needed to understand the microbiological events that occur simultaneously, such as changes of microbial community composition and metabolic changes."[231] "Release of microplastics (MPs) and nanoplastics (NPs) into agricultural fields is of great concern due to their reported ecotoxicity to organisms that provide beneficial service to the soil such as earthworms, and the potential ability of MPs and NPs to enter the food chain."[232]

Of further concern is the fact that the material does not completely biodegrade and could be washed into a creek or other waterway. "While very little is known about the effects of biodegradable plastics in soil, it has been shown that plastic microparticles can be toxic to aquatic organisms."[233] Additionally, if these materials are getting into the soil water on a mixed livestock and vegetable farm, could they also be getting into the livestock through the water, forage, and feed?

Allowing the use of BDM is not the solution to organic "plasticulture."

The subcommittee expresses concern regarding "some small- and large-scale growing systems, such as organic 'plasticulture' strawberry production [that] are highly dependent on PE films, with thousands of

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[229] Miles et. al. "Reliability of Soil Sampling Method to Assess Visible Biodegradable Mulch Fragments Remaining in the Field After Soil Incorporation." 2017.

[230] Bandopadhyay Sreejata, Martin-Closas Lluis, Pelacho Ana M., DeBruyn Jennifer M. "Biodegradable Plastic Mulch Films: Impacts on Soil Microbial Communities and Ecosystem Functions." *Frontiers in Microbiology*, Volume 9, 2018, Page 819.

[231] Sathiskumar Dharmalingam, Douglas G Hayes, Larry C Wadsworth, Rachel N Dunlap. "Analysis of the time course of degradation for fully biobased nonwoven agricultural mulches in compost-enriched soil." *Textile Research Journal,* November 2015, SAGE Publications.

[232] Astner et. al. "Mechanical formation of micro- and nano-plastic materials for environmental studies in agricultural ecosystems." *Science of the Total Environment.* Volume 685, 1 October 2019, Pages 1097-1106.

[233] Lönnstedt, O. M.; Eklöv, P. "Environmentally relevant concentrations of microplastic particles influence larval fish ecology." *Science* 2016, 352, 1213−1216.

acres of plastic used annually across the industry."[234] The allowance of BDM is not going to do away with organic "plasticulture" as long as container production is allowed under the organic standards.

Natural organic mulches should be the norm in organic production. The use of natural organic materials in compost and mulch is foundational to organic. In 2001, the National Organic Standards Board (NOSB)[235] gave this definition:

> Organic agriculture is an ecological production management system that promotes and enhances biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. These goals are met, where possible, through the use of cultural, biological, and mechanical methods, as opposed to using synthetic materials to fulfill specific functions within the system.

The NOSB went on to say that, among other things, an organic production system is designed to: "optimize soil biological activity;" "utilize production methods and breeds or varieties that are well adapted to the region;" "recycle materials of plant and animal origin in order to return nutrients to the land, thus minimizing the use of non-renewable resources;" and "minimize pollution of soil, water, and air." The use of natural mulches—including cover crops—contributes to all of these values.

Organic production systems are also intended to mimic natural ecosystems. In natural systems, plants are fed by the action of soil organisms breaking down plant residues and excreting substances that are plant nutrients. Natural mulches provide a steady diet of organic matter for those soil organisms. This function is one way that we can judge the compatibility of synthetic mulches with organic values.

The comparative risk of the two production aids leaves some organic community members uncomfortable.[236]

To be clear, we are currently unable to compare the risks without more research on the long-term effects of BDM. We have many concerns regarding the evidence of toxicity from secondary metabolites of BDM, but do not have answers to address these concerns. At this time, we are not even clear regarding all of the various secondary metabolites that may be left behind as BDM breaks down. Before we can fully begin to assess the comparative risk of PE mulch versus BDM, all secondary metabolites of BDM need to be identified. Organic agriculture relies on the precautionary principle, and the same should apply in the case of BDM and the concerns around the unanswered questions.

We, too, are "concerned about the precedent of allowing petroleum-derived products to be added directly to soils,"[237] especially in the quantity represented by this product. While NOC has continued to support the paper-based crop planting aids petition with reservations (as outlined in our comment on page 18), we are more comfortable in the fact that "paper-pot production aids are generally used by

[234] NOSB April 2021 proposals and discussion documents. Page 19 of 172.
[235] NOSB Principles of Organic Production and Handling. NOSB Recommendation Adopted October 17, 2001.
[236] *Ibid.* Page 19 of 172.
[237] *Ibid.* Page 19 of 172.

small farmers and their contribution to soil plastics is likely to be small compared to the thousands of acres of soil covered by PE films and their possible future BDM film replacements."[238]

Conclusion

NOC acknowledges that a biodegradable biobased mulch film would be a great asset to producers; however, we harbor great concerns regarding the environmental and health effects of the breakdown. Almost every paper we read notes that additional research is required.

> Biodegradable plastic mulches are a promising alternative to the currently used polyethylene-based mulches, but (additional) rigorous testing is needed to ensure their use is environmentally safe. (Further) in-field testing of biodegradation under different soil and climatic conditions is needed, with particular attention to release of micro- and nanoparticles from plastics and their long-term accumulation in soils and their effects on soil quality.[239]

> To address the current knowledge gaps, long term studies and a better understanding of impacts of BDMs on nutrient biogeochemistry are needed. These are critical to evaluating BDMs as they relate to soil health and agroecosystem sustainability.[240]

For almost every argument made for the use of biodegradable biobased mulch film, we could find a counter argument noting that more research is needed. We maintain that this product is "not ready for primetime." **The NOSB should vote no on this annotation change.**

[238] *Ibid.* Page 20 of 172.

[239] Henry Y. Sintim and Markus Flury, "Is Biodegradable Plastic Mulch the Solution to Agriculture's Plastic Problem?" Environmental Science & Technology. 2017, 51, 1068-1069.

[240] Bandopadhyay Sreejata, Martin-Closas Lluis, Pelacho Ana M., DeBruyn Jennifer M. "Biodegradable Plastic Mulch Films: Impacts on Soil Microbial Communities and Ecosystem Functions." *Frontiers in Microbiology*, Volume 9, 2018, Page 819.

Appendix F

EPA List 4 – Inerts of minimal concern – NOC Spring 2020 NOSB Comments

205.601(m) As synthetic inert ingredients as classified by the Environmental Protection Agency (EPA), for use with nonsynthetic substances or synthetic substances listed in this section and used as an active pesticide ingredient in accordance with any limitations on the use of such substances. (1) EPA List 4 – Inerts of Minimal Concern.

Regarding EPA List 4 – Inerts, NOC strongly supports the crops subcommittee's statement that "the current situation, where NOP policies are tied to long outdated US EPA guidance, is broken." It is an embarrassment to organic integrity that "the list of 'inerts' that is referenced for review of products for organic certification was last updated in August 2004."[241] The same issues are identified repeatedly every time inerts come up for sunset. The NOSB has made recommendations on how to move forward in resolving these issues, and in February 2016, the NOP issued the following response to the Fall 2015 NOSB recommendation:

> The NOP has reviewed the NOSB's recommendation and plans to collaborate further with EPA's Safer Choice Program to develop a program for inert ingredient review, and to initiate notice and comment rulemaking to revise the annotations for inert ingredients at 205.601(m) and 205.603(e).[242]

The NOP has an opportunity to act on this collaboration and put to rest the extinct EPA List references when it comes to "inerts."

We agree with the crops subcommittee that "the EPA Safer Choice Program is well established and offers a strong partner to identify acceptable inert materials, without each material needing to be reviewed individually by the NOSB."[243] We offer greater details below on how the NOP could contract with the EPA to prepare Technical Reviews (TRs) and review "inerts" to the OFPA criteria.

But first NOC recognizes the need to hire a National List (NL) manager to be able to accomplish these goals, and would suggest that perhaps there is a need for more than one NL manager at this time. While we know it is the preference of the Program that the NL manager work in the D.C. office, NOC strongly encourages the NOP to consider well-qualified individuals that live in the D.C. area, or are willing and able to relocate, as well as those that would work remotely. By limiting the search to only those who live in or are willing to relocate to the D.C. area, the NOP is severely limiting the opportunity to find the most qualified individual for the job.

Further, we recognize the need for an individual within the NOP to be able to work with the NOSB members and act as a liaison between the NOP, NOSB, and EPA. We further recognize that the NOP interacts with many other government agencies, and could envision building a job based on being a liaison with other departments within the USDA, with the EPA, and with other agencies. We support the NOP's efforts to increase their workforce in order to be able to accomplish the goals put before you. The

[241] NOSB April 2020 proposals and discussion documents Page 33 of 115.
[242] Miles McEvoy, February 29, 2016 Memorandum to NOSB.
[243] NOSB April 2020 proposals and discussion documents Page 36 of 115.

NOP must identify a staff person who can devote him or herself to working with the EPA and NOSB to move this work on inerts forward.

The remainder of our comments will focus on answering questions posted by the subcommittee.

Are there specific inert ingredients used in organically approved pesticide formulations that raise human health or environmental concerns?

Nonylphenol ethoxylates, and especially their precursor and degradates nonylphenols, are toxic and disruptive to the reproductive system. They were among the first environmental contaminants to be identified as "gender benders" – that is, chemicals that act as estrogens in the environment. According to the TR, "Virtually every environmental compartment can be contaminated through the use of NPEs. These substances generally enter the environment through wastewater, although large-scale applications of NPE dispersing agents in pesticide mixtures will also result in releases to soil, groundwater and neighboring surface waters. In the long term, contamination associated with NPE use occurs in the form of the more toxic and persistent metabolite, NP [nonylphenols]."[244]

NPs have higher levels of toxicity, estrogenic activity and environmental persistence than NPEs. The TR says, "However, release of NPEs to the environment from agricultural and consumer products ultimately leads to the introduction of more highly toxic and persistent NP residues. A lifecycle analysis of NPEs therefore highlights a conflict between use of these substances and the principles of organic agriculture, which seeks to avoid contamination of the environment with toxic and persistent substances."[245]

Because of concerns about the adverse health and environmental effects of NPEs, EPA's Design for the Environment (DfE) completed an alternatives assessment for synthetic surfactants, like NPEs, that are endocrine disrupting chemicals. DfE's goal is to assist in the voluntary phase-out of NPEs used in industrial detergents. The DfE assessment for NPEs reviewed several alternatives to NPE surfactants that are comparable in cost, readily available, and rapidly biodegrade to non-polluting, lower hazard compounds in aquatic environments.[246]

The European Union prohibits the use of NPE's in pesticides and teat dips.[247] Because major importers of dairy products in other countries are concerned about NPEs, teat dips containing NPEs are no longer available for either organic or nonorganic dairy production.[248] **The NOSB should have no trouble**

[244] 2015 Limited Scope TR: Nonylphenol Ethoxylates (NPEs), Lines 647-651, https://www.ams.usda.gov/sites/default/files/media/NPE%20Technical%20Evaluation%20Report%20%282015%29.pdf.

[245] 2015 Limited Scope TR: Nonylphenol Ethoxylates (NPEs), Lines 553-556, https://www.ams.usda.gov/sites/default/files/media/NPE%20Technical%20Evaluation%20Report%20%282015%29.pdf.

[246] Mark R. Servos, 1999. Review of the Aquatic Toxicity, Estrogenic Responses and Bioaccumulation of Alkylphenols and Alkylphenol Polyethoxylates, Water Qual. Res. I. Canada,Volume 34, No. 1, 123-177. A support document for Environment Canada's environmental assessment under the Canadian Environmental Protection Act.

[247] EPA, 2011. DfE Alternatives Assessment for Nonylphenol Ethoxylates.

[248] https://s3.amazonaws.com/static.boumatic.com/archive/16-DairySS_CAN_ENG_WEBview.pdf, https://extension.usu.edu/dairy/files/UtahStateDairyVetNewsletterNov2014.pdf.

prohibiting NPEs in teat dips. At this time, we would consider the prohibition of NPEs in teat dips a good start in the right direction.

NOC fully supports the removal of all NPEs as so-called "inert" ingredients in pesticides. So-called "inert" ingredients in pesticide products are neither chemically nor biologically inert. They are designed to enhance the pesticidal activity of pesticide products and can have toxic properties that do not meet the standards of the Organic Foods Production Act (OFPA). We point you to the more detailed comments on NPEs by our member organization, Beyond Pesticides, for further details.

Are there any alternatives for updating this listing other than the review of each substance individually or adoption of the EPA Safer Choice Program?
Although the recommendation passed by the NOSB at its fall 2015 meeting is inadequate to ensure that "inerts" meet OFPA criteria, the Safer Choice Program (SCP) and Safer Chemical Ingredients List (SCIL) can be helpful to the NOSB in reviewing these materials. While the current ratings for the SCIL "address many issues covered in the NOSB reviews according to the OFPA criteria, they do not address some important elements of OFPA reviews, including impacts on soil organisms and agroecosystems, essentiality/need, hazards associated with manufacturer, transportations, and disposal, and compatibility with organic systems."[249] This can be addressed by the SCP, in conjunction with the NOSB and NOP, creating a list of criteria that apply to the new class and subclasses suggested below that includes OFPA criteria, currently included in the checklist used by the NOSB.

Below we outline a detailed description of NOC's suggested procedure for evaluating "inerts" to be covered by a Memorandum of Understanding (MOU), that should be established between the EPA and NOP, along with a description of the responsibilities of each body (NOP, EPA, NOSB). The procedure we are recommending is based on the outstanding NOSB recommendations made from fall 2012 and fall 2015. NOC is recommending that the Inerts Working Group (IWG) be reestablished, with membership consisting of NOSB members with support from a NOP staff person.

Suggested Procedure

1. NOP should immediately (as stated in the NOP response to the Fall 2012 proposals) conduct a public notice and comment process including:
    a. Notification to the public of "inert" ingredients known to be in use in organic production;

    b. Notification to the public of NOSB's review plan;

    c. A request for public comments regarding any other "inert" ingredients currently used in organic production that are not identified in the list provided by NOP; and

    d. A description of this MOU as a description of the means of implementing the Fall 2015 NOSB recommendation. It will state that "on the Safer Chemical Ingredients List (SCIL)"

[249] Shistar, T. "Inert" Ingredients Used in Organic Production. Beyond Pesticides, Washington, D.C., 2017, p. 24.

means “on the section of the SCIL identified as ‘Ingredients Other than Active Ingredients in Pesticides Used in Organic Production.’”

2. EPA will create a new section of the Safer Chemical Ingredients List (SCIL) for “Ingredients Other than Active Ingredients in Pesticides Used in Organic Production.” This list will contain sublists by the function – such as surfactants, chelating agents, and antioxidants – that they perform in the pesticide product.

3. EPA will identify products in use in organic production in which the “inerts” identified by NOP are used, the function of each “inert” ingredient within the products, and alternative materials that serve the same function. In concert with NOP and the NOSB, EPA will divide the list of “inerts” into five groups. The EPA will review one group per year and provide their review in the form of a TR to the NOSB. One year’s review group may include one or more functional classes. For example, Surfactants and Anti-Oxidants may be reviewed in one year, with Chelating Agents and Solvents reviewed the next.

4. EPA will evaluate the “inerts” identified by NOP and the EPA alternatives according to the criteria appropriate for the substance’s function and will assign ratings according to the current practice within the Safer Choice Program (SCP) – i.e. green circle, green half-circle, yellow triangle, and gray square. This system of review would result in prohibition of some currently approved inert ingredients, such as NPEs, a class of substances that has raised concerns at past NOSB meetings. Additionally, EPA’s review will cover all topics covered in a technical review (TR) commissioned for the NOSB, as well as the topics required to rate the substances according to the SCP. To minimize duplication of work and ease NOSB review, a single review will cover chemicals in the same functional class.

5. EPA will provide a public version of the information it reviews to the NOSB, which will be used as a TR. It will be posted on the NOP website for public viewing. It will contain the following:
    a. A chart of all inerts in the class identified by the Chemical Abstracts Service (CAS) number with their chemical properties, uses, types of product categories in which they occur, and EPA regulatory-status, including data gaps.

    b. A description of how inerts within the class are related and how different, especially outliers that are significantly different from others.

    c. A chart that evaluates each inert in the class under the screening steps suggested by EPA and any additional screening recommended by the NOSB, with input from the IWG.

    d. OFPA criteria will be addressed that are not usually covered in the EPA review (environment, interactions, and alternatives or essentiality).

6. Based on results of the group TR, the NOSB Crops Subcommittee, working with the Livestock Subcommittee as appropriate, will accept the class to move forward to the NOSB agenda, or single out one or more substances for individual review – in which case, the group will then move forward without that substance and that one substance will be re-reviewed in more detail, if necessary, and noted in the NOSB published materials for stakeholder review separately. This substance can be commented on and voted on separately at the NOSB meeting.

7. The NOSB will review the information provided by EPA according to its usual materials review procedures, subjecting them to OFPA criteria based on the TR information provided for the class – or on individual materials that have been "singled out," as described in #6 above.

8. In accordance with its meeting and notice procedures, after NOP publishes the NOSB proposal for listing a class of "inerts" on the National List (as part of the SCIL sublist for "Ingredients Other than Active Ingredients in Pesticides Used in Organic Production"), the NOSB will vote on the proposals and recommend listing or not listing each class.

9. NOP will publish recommendations from the NOSB for public comment according to its usual National List procedures, gather public comment, and finalize the listing.

10. EPA will add the approved chemicals, with approved annotations, to the appropriate subsection of the SCIL sublist for "Ingredients Other than Active Ingredients in Pesticides Used in Organic Production."

11. Stakeholders may submit applications for individual inert ingredients to EPA for inclusion on the Safer Chemical Ingredients List and/or petition the NOP for inclusion on the National List.

Suggested Responsibilities:
NOP:

- NOP should immediately (as stated in the NOP response to Fall 2012 proposals) conduct a public notice and comment process including:
    - Notification to the public of "inert" ingredients known to be in use in organic production;
    - Notification to the public of NOSB's review plan; and
    - A request for public comments regarding any other "inert" ingredients currently used in organic production that are not identified in the list provided by NOP.

- NOP will publish for public comment a description of this MOU as a description of the means of implementing the Fall 2015 NOSB recommendation. It will state that "on the SCIL" means "on the section of the SCIL identified as 'Ingredients Other than Active Ingredients in Pesticides Used in Organic Production.'" This may be the same Federal Register notice as the above notice.

- NOP will publish in the Federal Register recommendations from the NOSB for public comment according to its usual National List procedures, gather comments, and send the finalized listing to EPA.

- NOP will provide expertise as needed to EPA to address issues not generally covered by EPA's Safer Choice reviews.

EPA:

- EPA will create a new section of the Safer Chemical Ingredient List (SCIL) for "Ingredients Other than Active Ingredients in Pesticides Used in Organic Production." This list will contain sublists by the function –such as surfactants, chelating agents, and antioxidants—they perform in the pesticide product.

- EPA will identify products in use in organic production in which the "inerts" identified by NOP are used, the function of each "inert" ingredient within the products, and alternative materials that serve the same function.

- In concert with NOP and the NOSB, EPA will divide the list of "inerts" into five groups and review one group per year. Each group may contain one or more functional class.

- EPA will evaluate the "inerts" identified by NOP and the EPA alternatives according to the criteria appropriate for the substance's function and will assign ratings according to the current practice within the Safer Choice Program –i.e., green circle, green half-circle, yellow triangle, and gray square.

- EPA will provide a public version of the information it reviews in the form of TRs to the NOSB.

- EPA will list in the appropriate section of "Ingredients Other than Active Ingredients in Pesticides Used in Organic Production" those "inerts" approved by the NOSB and NOP.

NOSB:

- The NOSB will review the information provided by EPA according to its usual materials review procedures, subjecting them to OFPA criteria.

- In accordance with its meeting and notice procedures, after NOP publishes NOSB proposals for listing of "inerts" on the National List and the SCIL sublist for "Ingredients Other than Active Ingredients in Pesticides Used in Organic Production," the NOSB will vote on the proposals and recommend listing or not listing for each.

- The NOSB will review petitions for "inerts" to be added to or removed from the appropriate SCIL sublist for "Ingredients Other than Active Ingredients in Pesticides Used in Organic Production." These will be treated as any other petitioned substance, with TRs contracted through the EPA.

We offer the "'Inert' Ingredients Used in Organic Production" authored by Terry Shistar, PhD, for Beyond Pesticides as an attachment to our comments. This report offers many more details into "inerts" in general, NPEs, the timeline of NOSB actions on "inerts," a comparison of Safer Chemical and NOSB approach, and the Safer Chemical Ingredients List (SCIL), as well as other valuable information.

What would be the consequences of a NOSB recommendation to delist List 4 Inerts?
As pointed out by the subcommittee, delisting List 4 inerts and having the NOP act on the 2015 recommendation "would encourage innovation of new products, lessen concerns of stakeholders over environmental and health concerns, and make future reviews of inert materials much easier."[250] Continuing to address the same issues over inerts repeatedly at each sunset review is a waste of everyone's time and efforts.

[250] NOSB April 2020 proposals and discussion documents Page 34 of 115.

Appendix G

Petition Process for §205.606 – NOC Spring 2020 NOSB Comment

Now that any agricultural material can be produced organically, additions to §205.606 should be rare, and materials should be removed from the list whenever possible in order to encourage processors to source organic forms. We encourage the Handling Subcommittee to further consider that a greater burden to clearly define the barriers preventing the organic production of the petitioned substance must be imposed on the petitioner before the NOSB and organic stakeholders can make an informed decision regarding listing or relisting.

It is time to stop adding listings to §606 and phase out current listings.

Organic production is grown up now, and any agricultural commodity can be produced organically. Listing on §606 only stifles organic production of new organic crops and promotes chemical-intensive production. Finally, in the time that it takes to add new regulations, petitioners could develop the demand for the organic product.

Questions that need to be addressed before renewing any listing on §606.

Materials on §205.606 are allowed in products labeled as organic if they are agriculturally produced, but have been found to not be commercially available as organic. The NOSB needs to know what the barriers are to producing the product organically. The Handling Subcommittee should get documented answers to the following questions in determining the barriers to organic production, for both petitions and sunsets.

1. What are the proximity constraints for either a manufactured or raw agricultural commodity in organic form? Examples include perishability, political climate (e.g., war zone) of the area where the agricultural production occurs, and the location of the manufacturing facility.

2. Is there insufficient raw organic agricultural production within the necessary proximity of the main manufacturing facility? Shipping costs are not to be part of the consideration.

3. Are there other manufacturing facilities that may have organic agricultural raw ingredient production nearby, or could be enticed to produce this ingredient in an organic form?

4. If raw agricultural production is required in a specific climate or soil type where there currently is no organic production and prospects for organic production are difficult (climate, transportation, war etc.), has production in other areas of the world been researched and work begun to develop new sources of organic crop production of the source ingredients for this product?

5. If there is only non-organic production near a manufacturing facility, what are the barriers to having these producers transition some or all of their production to organic?

6. Have the petitioner and users of this §205.606 ingredient worked with both the manufacturing facilities and pools of growers in the area to develop a supply of raw organic crops to produce this ingredient?

7. Is the demand for this ingredient across the organic industry sufficient to meet the minimum manufacturing production run?

8. Have all possible manufacturers (domestic and international) of this ingredient been researched to determine their minimum production runs and regions where the raw agricultural ingredient or ingredients are grown?

9. Can the ingredient be manufactured from not only raw agricultural ingredients, but possibly a secondary manufactured ingredient, such as beet color made not only from raw organic beets, but also from a preprocessed beet juice or beet powder that could be obtained in an organic form? Another example would be instant nonfat dry milk powder made not just from liquid organic skim milk, but from non-instant organic nonfat dry milk powder.

10. Is the process by which this product is manufactured patented, and if so, is the manufacturer willing to produce an organic equivalent?

11. Is there documentation of the petitioner's efforts to develop organic production?

12. Can the petitioner prove that a specific flavor profile can only be achieved from the petitioned material grown in a specific region?