**DRAFT – DO NOT CIRCULATE – OTA MEMBERS ONLY**

Ms. Michelle Arsenault
National Organic Standards Board
USDA-AMS-NOP

**Docket:** AMS-NOP-19-0095

**RE: Materials Subcommittee – NOSB Research Priorities 2020 (Discussion Document)**

Dear Ms. Arsenault:

Thank you for this opportunity to provide comment on the National Organic Standards Board (NOSB) Materials Subcommittee's Discussion Document on NOSB Research Priorities 2020.

The Organic Center is a non-profit organization with the mission of convening credible, evidence-based science on the environmental and health benefits of organic food and farming and communicating findings to the public. We are a leading voice in the area of scientific research about organic food and farming, and cover up-to-date studies on sustainable agriculture and health while collaborating with academic and governmental institutions to fill knowledge gaps.

The Organic Center thanks the Materials Subcommittee for its recommendation on Research Priorities. We appreciate the creation of the Research Priority Framework and the efforts made by each Subcommittee to bring forth its research priorities for 2020.

**Summary:**

- ✓ The Organic Center supports the subcommittee's proposed 2020 Research Priorities. The proposed priorities are in line with the needs of the organic industry, and will serve as an important resource to guide The Center's research priorities and project development.

- ✓ Based on feedback we've received during our own outreach efforts, we would also like to suggest that the areas of soil health, protection of organic farmers from chemical contaminants, comparisons of pesticide, antibiotic, and synthetic growth hormone residues in organic and conventional products, and alternatives to conventional celery powder for curing organic meat be considered for inclusion in the 2020 Research Priorities.

**We offer the following more detailed comments:**

**Current Research Needs**

We have reviewed the list of topics included for 2020 priorities, and we're particularly pleased to see the inclusion of "Organic no-till practices for diverse climates, crops, and soil types," "Development of systems-based plant disease management," "Strategies for the prevention, management, and control of invasive insects," "The relationship between on-farm biodiversity and pathogen presence and abundance," "Pathogen prevention," and "Reducing greenhouse gas emissions." The Organic Center is actively involved in conducting and communicating research on these issues, and we expect the prioritization of these topics by NOSB may help us secure further funding.

Organic No-Till Practices

The Organic Center is collaborating with Dr. Kate Tully's lab at the University of Maryland to examine practices improving soil health on organic farms. We recently published a scientific article from research on this topic, and one of the areas that we included was the comparison of no- and low-till in organic production versus standard tillage in organic production. Overall, our results suggest that surface-level soil organic carbon levels are higher in low/no-till organic plots compared to standard organic tillage plots. However, we also found that no/low-tillage in organic was associated with significant reductions in yield. These findings suggest that while organic farmers could improve carbon sequestration through no/low-tillage, there needs to be further research to support farmers wishing to make this conversion to ensure that it is a viable and economically feasible option for a wider variety of crops. We are thankful that NOSB included this priority in its 2020 Research Priorities, as it will help encourage research on this critical issue, and provide much-needed tools to help organic farmers realize the benefits of reduced tillage without the threat of reduced yields.

Plant Disease Management

The Organic Center has a record of addressing been working on several aspects of plant disease management. For example, we have an active project on citrus greening, caused by the bacterium *Candidatus liberibacter*. Our research to find organic solutions to control citrus greening disease is an ongoing project in collaboration with the University of Florida, the University of California, Davis, USDA-ARS, citrus growers, and other non-profits. We recently published a scientific paper and accompanying farmer guide consolidating existing literature on allowable methods for combating citrus greening in organic groves. It details science-based best practices for organic citrus growers. We leveraged this paper to apply for additional funding, and were recently awarded an OREI planning grant to develop a proposal that takes a systems-based approach to combat both the bacterium that causes citrus greening disease and its insect vector, the Asian citrus psyllid, in organic systems.

Invasive Insects

In addition to our work on the Asian citrus psyllid, The Organic Center is also completing research to develop Integrated Pest Management strategies for organic rice production in the Southern United States. This project is being conducted in collaboration with Texas A&M

University's AgriLife Research & Extension Center, Texas A&M Department of Soil and Crop Sciences, USDA's ARS Dale Bumpers National Rice Research Center, University of Arkansas Rice Research and Extension Center, and University of Arkansas at Pine Bluff Department of Agriculture. Flooded rice production systems used by organic farmers result in increased pressure from the diseases, weeds, and insect pests not commonly found in dryland cropping systems. This is especially problematic in the South because of the region's warm, humid environments and long growing season. This project focuses on developing cover crop-based production systems in combination with cultivar choice and seed treatment to enhance disease, weed, insect pest, and nutrient management, allowing producers to grow organic rice more sustainably and profitably in the South.

Pathogen Prevention

Unfortunately, some third-party food safety auditors believe that some biodiversity-maintenance strategies employed by organic farmers may increase the risk for introduction of human pathogens on the field. While some research has been conducted disproving this myth, more research, extension, and education are needed to fully understand the relationship between on-farm biodiversity and food safety – and this research must be communicated to third-party food safety auditors and incorporated into their audits. Therefore, we thank the committee for including a pathogen prevention research focus in 2020.

The Organic Center is deeply involved in research examining pathogen presence in organic soil amendments. For example, we are collaborating with the University of California, Davis, among other organizations, to address the need for additional information on raw manure intervals to provide critical information for guidelines on risk mitigation of foodborne pathogens for organic and sustainable agriculture. We have published multiple articles and abstracts on the subject, and are currently developing an education module in collaboration with Cornell University to communicate our findings to a broad audience.

We also recently applied for a grant to examine and communicate the safest strategies for application of aged manure. Currently, the FDA does not recognize aging manure as a way to reduce pathogens, but aged manure is the most commonly used animal-based soil amendment used on organic farms. Understanding potential benefits to pathogen reduction through aging (rather than full composting of the manure) could help organic farmers understand the full suite of options for controlling pathogens while managing soil health and crop nutrients.

Reducing Greenhouse Gas Emissions

Climate change is having serious consequences on our environment and public health, and we appreciate the inclusion of the "Climate Change" focus in the 2020 priorities. The Organic Center has been engaged with climate change issues for several years now on multiple levels. For example, last year co-hosted our annual Organic Confluences Conference with USDA, FiBL, The Climate Collaborative, and ISOFAR to focus on mitigating and adapting to climate change. The conference brought together scientific experts, farmers, policymakers, and organic

stakeholders to address the current impacts of climate change and best practices within the organic sector for mitigation and adaptation, while examining methods for encouraging the adoption of strategies for fighting climate change. We are currently working on a white paper detailing the outcomes of the event, but it is clear that additional research is needed to address this issue; the long-term security of our food system depends on it.

We also have active research projects on the subject of climate change mitigation, and are specifically conducting analyses to "pinpoint specific strategies that organic farmers can take to reduce greenhouse gas emissions and respond to current climate challenges threatening the future of our food security." For example, we are working on a project in collaboration with researchers at the University of Maryland to pinpoint specific strategies organic farmers can take to increase carbon sequestration in the soil. We are also working with Harvard University's Department of Public Health examining the specific aspects of organic agriculture that can contribute the greatest benefits to climate stability. These net benefits include carbon sequestration in the soil and reduced energy usage by avoiding synthetic nitrogen fertilizer.

**Additional Research Needs**

The Organic Center is continually collecting information on research needs from multiple sectors of the organic community. We conduct industry roundtables, work with the Organic Trade Association's Farmers Advisory Council, meet with professors on our Science Advisory Board and hold one-on-one meetings with individual companies, farmers, professors, and consumers. We feel that the NOSB Materials Subcommittee's proposed 2020 Research Priorities are in line with the needs of the organic industry, and appreciate the release of this report as an important resource to guide The Center's own research priorities and project development. Based on feedback we've received during our own outreach efforts, we would also like to suggest that the areas of soil health, protection of organic farmers from chemical contaminants, and comparisons of pesticide, antibiotic, and synthetic growth hormone residues in organic and conventional products be considered for inclusion in the 2020 Research Priorities. We also feel that the focus on alternatives to conventional celery powder for curing organic meat that was included in the 2019 Research Priorities be included in this year's priorities, because, while research is underway, the importance of this topic should not be forgotten.

Soil Health

The U.S Department of Agriculture's Natural Resource Conservation Service (USDA NRCS) defines soil health as "the continued capacity of the soil to function as a vital living ecosystem that sustains plants, animals and humans." While many other definitions of soil health exist, the majority of modern definitions exemplify the ecological attributes of soils, recognizing that their importance extends far beyond simple crop production.

A growing body of scientific literature evaluates the relative contribution of different management practices for improving soil health. However, significant variation in characteristics assessed and the methods used to gauge those means that oftentimes results across different

studies are not comparable. Even when scientific studies do use comparable measures of soil health, they may come to contradictory conclusions. Management decisions that lead to an improvement in soil quality in one study may be less effective in another, suggesting that some protocols must be carefully considered based on localized conditions to achieve best results. As such, reaching solid conclusions on best-management practices for achieving optimal soil health and fertility can be difficult, particularly for organic farmers who cannot rely on formulaic recommendations for fertilizer application.

To address this, The Organic Center is collaborating with researchers from the University of Maryland–College Park to conduct a comprehensive review of the most current science that evaluates organic compliant methods for optimizing soil health to develop best practices for organic farmers. Specifically, this project seeks to (1) review the literature comparing soil health on organic and conventional farms and discussing practices that differ between them that could be contributing to this difference; (2) understand variance in characterization of soil health and indicators used to assess it within the scientific literature; (3) identify science-supported best practices for maintaining and building soil health in organic systems; (4) identify practices that lead to variable results based on geography, climate, soil type, or commodity grown and therefore must be optimized based on local variables, and (5) identify areas where more research is needed.

Protection of organic farmers from chemical contaminants

Unintentional pesticide contamination in organic crops has been flagged as a major challenge by the organic sector, across the supply chain. For example, the Organic Trade Association's Farmers Advisory Council has highlighted it as a top priority in their 2019 work plan, and the Organic Trade Association is currently assembling a task force to engage the industry in protecting organic integrity from pesticide contamination. Contamination can have a disproportionate impact on organic farmers, because organic stakeholders along the entire supply chain are burdened with the cost of testing and experience losses when tests are positive. While the organic community has identified this as a critical topic for investigation, little data has been collected synthesizing the current experiences and specific research needs of the organic community.

The Organic Center recently submitted an OREI planning grant to address this issue by bringing together organic stakeholders across the supply chain with scientists to determine the crops that are most heavily impacted by contamination, pesticides that the organic industry has detected on its crops, losses that organic farmers and industry members have experienced, strategies that organic farmers have undertaken to reduce pesticide drift, and research needs for identifying vectors and preventing contamination to inform the development of a large-scale and multi-disciplinary research project that will provide farmers with strategies for combating current contamination.

While we laud the NOSB for including the focus "Prevention of GMO Crop Contamination:

Evaluation of effectiveness," the issue of contamination is not unique to genetically modified material, and we request that chemical contamination be included in the research priorities as well.

Comparisons of pesticide, antibiotic, and synthetic growth hormone residues in organic and conventional products

Understanding the benefits of organic when it comes to avoiding synthetic toxins is critical, because it is the basis behind hypotheses for recent research finding health benefits to consuming an organic diet such as a 25% reduction in overall cancer risk.

The Organic Center recently completed a study in collaboration with Emory University showing that organic is an easy way to avoid pesticides, antibiotics, and synthetic growth hormones in dairy. Specifically, the study found no detectable levels of any antibiotics in organic milk in comparison with 60% of conventional samples having detectable levels of antibiotics. We also found that over 30% of conventional samples had residues of antibiotics that are banned for use in lactating cows. Conventional levels of growth hormones were twenty times higher than the organic levels. For pesticides, we found that organic milk didn't have any residues of currently used pesticides, but pesticides over 60% of conventional milk, including chlorpyrifos, atrazine, and diazinon.

Additional research on the impacts of organic on exposure to residues, and connections between these exposures and health outcomes are critical for understanding emerging research on the long-term health effects of an organic diet.

Celery Powder

In collaboration with the Organic Trade Association's National List Innovation Working Group and the University of Wisconsin, Madison, we are investigating the potential for developing organically grown celery or other vegetables used in the curing of organic meat products. This OREI-funded research will help identify potential varieties of organic crops that would meet the chemical specification needed for curing, while being easily incorporated into current crop rotation systems. It will also identify potential management protocols to achieve target nitrate levels in the curing crop to produce the required shelf life and prevent bacteria in the cured meat, and to produce the desired flavor, color and texture in food. This research will take 4 years to complete. During this time period, or until final results are collected to meet this need, we request that alternatives to conventional celery powder for curing organic meat be included in the NOSB Research Priorities.

Please do not hesitate to contact us for information on the data that we have been collecting or with questions you would like us to pose the research community.

Again, on behalf of The Organic Center, I would like to extend my thanks to the Materials Subcommittee for your commitment to furthering organic agriculture.

Respectfully submitted,

Jessica Shade
Director of Science Programs
The Organic Center