October 24, 2016

Ms. Michelle Arsenault
National Organic Standards Board
USDA-AMS-NOP
1400 Independence Avenue, SW
Room 2648-So., Ag Stop 0268
Washington, DC 20250-0268

Docket: AMS-NOP-16-0049

RE: Crops Subcommittee – Hydroponic/Aquaponic Task Force, 'Bioponics,' and Container and Greenhouse Production

Dear Ms. Arsenault:

Thank you for this opportunity to provide comment on the report from the NOSB Hydroponic/Aquaponic Task Force, the Crops Subcommittee's (CS) proposal on 'bioponics,' and the CS discussion document on container and greenhouse production.

The Organic Trade Association (OTA) is the membership-based business association for organic agriculture and products in North America. OTA is the leading voice for the organic trade in the United States, representing organic businesses across 50 states. Its members include growers, shippers, processors, certifiers, farmers' associations, distributors, importers, exporters, consultants, retailers and others. OTA's Board of Directors is democratically elected by its members. OTA's mission is to promote and protect organic with a unifying voice that serves and engages its diverse members from farm to marketplace.

OTA has supported NOSB's 2010 recommendation on Production Standards for Terrestrial Plants in Containers and Enclosures (Greenhouses). This recommendation provided clear definitions for hydroponics and aeroponics, recommended that these practices be prohibited in organic production, and provided guidelines for container and greenhouse production to ensure these systems, which grow crops without soil, meet organic principles. Our position on this recommendation has not changed, and we support NOSB's work to provide clarification to NOP in order for rulemaking to occur to implement this recommendation.

Summary of OTA's Position

- **Hydroponic/Aquaponic Task Force Report –** OTA believes that the Task Force report did not fully meet its mandate to inform NOSB on current practices used in hydroponics and aquaponics and examine how those practices align or do not align with the Organic Foods Production Act (OFPA) and USDA organic regulations. Sections of the report do provide substantive descriptions of currently certified organic hydroponic, aeroponic, and aquaponic (bioponic) operations that should assist NOSB in discussing this topic at future meetings. However, the report does not provide a balanced deliberation on the alignment of these practices with OFPA and USDA organic regulations. Instead, it appears as though the task force splintered into two camps focused on

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persuading NOSB either for or against a prohibition on bioponics in organic production, and it is unclear whether this will assist or distract NOSB from providing recommendations to NOP to clarify the 2010 recommendation on Production Standards for Terrestrial Plants in Containers and Enclosures (Greenhouses). Additionally, OTA takes exception with the assertion in certain areas of the task force report that reliance on liquid fertilizers somehow intrinsically disqualifies an operation from organic certification. This assertion is not based on an accurate understanding of how organic fertilizers interact with crops, and we request that NOSB gain a better understanding of these processes before finalizing its proposals and refining its discussion documents.

- **Proposal to allow Bioponics (Hydroponics, Aeroponics, and Aquaponics) –** OTA encourages NOSB to refer this proposal back to the CS for further refinement. We do not believe this proposal is sufficiently developed or properly structured for the following reasons:
    - It is unclear what the implications are for these types of operations should the proposal fail.
    - The definitions for these types of operations included in the proposal are different from those included in the 2010 recommendation, so, should the proposal pass, it is unclear which definitions should be used by NOP in rulemaking.
    - It is unclear why CS decided to lump these three distinct types of operations into a single category that is more broad and vague, rather than considering them each individually on their own merits.
    - Voting on allowance or prohibition of aquaponics at this juncture seems premature, as these systems utilize fish for fertility and nutrient cycling, and proposed organic aquaculture standards have yet to be released.

- **Discussion document on container and greenhouse production –** OTA supports the allowance for organic container and greenhouse production provided appropriate guidelines are established to ensure adherence to organic principles. This position is consistent with the 2010 recommendation on Production Standards for Terrestrial Plants in Containers and Enclosures (Greenhouses). We support the CS work to further clarify and refine these requirements in a future recommendation. However, we are concerned with the current trajectory of the discussion document which seems again to be based on the inaccurate assumption that the use of liquid fertilizers circumvents the soil microbe-plant root interaction that is a hallmark of organic nutrient management. This highlights the need for additional expert input into the discussion. As a result, we encourage NOSB to request an expert panel at a future meeting to inform board members on organic nutrient availability, soil food web characteristics, and specific measureable outcomes of a healthy soil microbial population. Additionally, we encourage NOSB to consider a metric that requires a minimum level of biodiversity of soil microorganisms (e.g. breadth and depth of microbial trophic levels) to be present in the production system as a means of verifying compliance with OFPA and USDA organic regulations in lieu of what appear to be somewhat arbitrary restrictions on container size or fertilization program.

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We offer the following more detailed comments:

Hydroponic/Aquaponic Task Force Report

Task Force Mandate

When NOP convened the Hydroponic/Aquaponic Task Force, it laid out the Task Force's objectives as 1) describe the current state of technologies and practices used in hydroponics and aquaponics; and 2) examine how those practices align or do not align with OFPA and the USDA organic regulations. The content provided in *Section 2: Hydroponic and Aquaponic Subcommittee Report* provides substantive input in describing these types of operations and largely fulfills the first mandate of the full Task Force.

However, the task force did not deliver a nuanced discussion on how these types of operations either align or do not align with OFPA and the USDA organic regulations. Instead, the subcommittee focusing on the 2010 NOSB recommendation provides background and justification to its opinion that OFPA mandates that organic production must take place in soil. The third subcommittee addresses alternative labeling, which may prove to be a viable direction for NOSB to take, but does not provide NOSB with additional input on the fundamental question at hand—which is to determine whether hydroponic and aquaponic systems align with OFPA and USDA organic standards. As NOSB reviews the Task Force report, hears public comments on its proposals and discussion documents, and deliberates, it will continue to need to evaluate alignment of these types of operations with OFPA and USDA organic regulations, but will find limited assistance from the Task Force report for these determinations.

Nutrients

A common thread throughout some sections of the Task Force report is the misconception that fertilization in hydroponic and aquaponic systems circumvents the organic approach to plant fertility management. It is widely known and accepted that organic farmers feed the soil, which, in turn, feeds the plant. This is why most water-soluble fertilizers are not allowed in organic production. Sodium nitrate is a notable exception to this, but its current allowance is due only to delays in implementing NOSB's recommendation that it be completely prohibited in organic farming. It is inappropriate and inaccurate to correlate the use of allowed liquid fertilizers with the use of soluble conventional fertilizers.

Plants can take up nitrogen in one of two forms: ammonium or nitrate. Most organic fertilizers contain small fractions of these soluble, and plant available, nutrients, but regardless of the fertilizers' form, the vast majority of nitrogen is contained within complicated amino acids. For these amino acids to be transformed into ammonium or nitrate, they must first be digested by a microbial organism. Without microbes, managing fertility with the limited amount of organic approved nitrogen sources is impossible. This holds true whether the nitrogen comes in a solid or liquid product, and it holds true whether the microbes live in the soil, in a water-based solution, or in a soil-less media.

It is critical that NOSB evaluate nutrient management systems when evaluating whether hydroponic and aquaponic systems align with OFPA and USDA organic regulations. However, NOSB cannot infer that hydroponic and aquaponic systems circumvent the nutrient-microbe-plant pathway simply because soil is not a component of these systems.

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Consensus Around Microbes

Despite the divergent views expressed within the Task Force report, there is some consensus thinking that can be gleaned. In particular, it appears that all groups agree the instrumental role of microbes in nutrient cycling is one of the aspects that differentiates organic from conventional production. We urge NOSB to investigate this concept further as it deliberates on its proposals and discussion documents. How much microbial activity and diversity are necessary to meet the spirit and intent of organic production? Does growing in soil always fulfill this expectation? Is there a way for soil-less systems to measure how they replicate this microbial activity and diversity?

Proposal to allow Bioponics (Hydroponics, Aeroponics, and Aquaponics)

OTA is concerned that the proposal to allow bioponics is not developed enough to warrant a full Board vote. We believe that should this proposal pass or fail, there remain significant questions about the effects this proposal would have on rulemaking. We recommend that NOSB vote to bring this proposal back to subcommittee and deliberate further on developing a proposal that builds upon the 2010 recommendation on Production Standards for Terrestrial Plants in Containers and Enclosures (Greenhouses), incorporates learning from the Hydroponic/Aquaponic Task Force report, and honors public comments from organic stakeholders.

Structure

Two areas of the proposal's structure could be further defined to ensure clear communication of a recommendation to NOP for rulemaking: definitions and distinction.

- **Definition:** It is unclear whether CS is proposing new definitions for the terms 'hydroponics,' 'aeroponics,' and 'aquaponics' in this proposal. We recommend that CS, in its next proposal, provide specific definitions for each term in separate motions. This will clarify exactly what definition should be added to the USDA organic regulations to describe each type of practice.
- **Distinction:** We recommend CS propose allowance or prohibition of each practice in three distinct motions (i.e. one motion for hydroponics, one motion for aeroponics, and one motion for aquaponics). While referring to these three types of production practices as 'bioponics' makes discussion more simple, recommendations must be clear and concise. Since all three types of production have distinct aspects that could affect their alignment with OFPA and USDA organic regulations, NOSB should consider them each individually.

Mechanics

OTA remains confused regarding the mechanics of this proposal should it pass or fail. If the proposal passes, would any rulemaking be required since these types of operations are already allowed under USDA organic regulations? If the proposal fails, would the Board be recommending rulemaking to prohibit hydroponics, aeroponics, and aquaponics? If so, which definitions should be used for this rulemaking? Should NOSB vote to allow or prohibit aquaponics before a proposed aquaculture standard has been released from USDA? We believe that the outcomes and mechanics of seeing this proposal through the rulemaking process need further development and explanation in order for the Board to take a vote.

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Getting It Right Takes Time

We acknowledge the strong opinions present on the issue of 'bioponics'' compatibility with organic regulations and principles. This issue has continued to divide some segments of the organic industry, and many producers' livelihoods are at stake with this proposal. The potential impact that prohibiting certain practices would have on the industry underscores the need for a clear and well-thought-out proposal. NOSB spent many meetings to ensure its animal welfare proposal struck the right balance and could be implemented by USDA. In contrast, the CS is requesting that the full Board vote on this proposal at the first meeting after release of the Hydroponic/Aquaponic Task Force report. We hope NOSB can recognize the significance of the decision to continue to allow or to prohibit 'bioponics,' and take the time necessary to bring forth a proposal that is well supported by facts and stakeholder input and that is actionable by USDA should rulemaking be necessary. We strongly urge NOSB to refer this proposal back to the CS for further development.

Discussion Document on Container and Greenhouse Production

OTA supported the 2010 recommendation on Production Standards for Terrestrial Plants in Containers and Enclosures (Greenhouses), and we continue to support the role that container and greenhouse production play in the organic industry. We appreciate the CS acknowledgement that container production falls outside of the scope of 'bioponics' but is distinct enough from soil-based production to warrant its own set of organic guidelines. We support this effort and submit the following comments to assist in refining and clarifying the guidelines for these types of operations.

Alignment with OFPA and USDA Organic Regulations

OTA believes that containerized and greenhouse production can align with OFPA and USDA organic regulations, but that these types of production systems must be certified under an organic standard that addresses these unique growing conditions. CS has started to identify the large areas that should be included in a proposal for container and greenhouse standards, and we offer the following additional comments:

- **Land Use –**CS should consider the role that land eligibility should play in standards for containers and greenhouses. Organic farmers growing in soil can only represent their crops as organic after their land has been free of prohibited substances for 36 months. Should container and greenhouse growers be subject to the same requirement? We suggest the CS explore the various scenarios that could occur for a new containerized or greenhouse operation, and how land eligibility either aligns or does not align with OFPA and the USDA organic regulations.
- **Planting Stock –** Soil-based organic farmers may use non-organic planting stock when organic is commercially unavailable and harvest an organic crop the first year. To sell the planting stock itself as organic, the planting stock must be under organic management for a minimum of 12 months. Is any modification of this approach to planting stock needed in a containerized or greenhouse setting?
- **Nutrients –**CS has indicated that types and sources of nutrients added to a containerized and greenhouse operation should be considered in guidelines for these types of operations. However, we continue to be concerned that CS is focusing on nutrients without a clear understanding of how organic fertilizers interact with plants. Before proposing arbitrary guidelines on how much fertilizer should be granular vs. liquid, we encourage CS to solicit input from expert organic soil

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scientists and agronomists, so that any guidelines proposed around the form or source of nutrients in containerized and greenhouse operations be based on sound science.

- **Container Size –**CS also appears to be considering the size of the container as a potential metric for containerized and greenhouse guidelines. The discussion document references the Canadian standards and scientific research that attempted to answer the question of how much media is needed to eliminate the need for liquid organic fertilizers. We disagree with the approach that requiring enough media to eliminate liquid feeding is the appropriate metric to determine adherence to OFPA and USDA organic regulations. Rather than focus on size of containers or inputs into the system, we encourage CS to explore developing metrics for measuring the complexity of microbial ecosystems supported by a producer's particular system. Requiring a minimum amount of microbial complexity and activity could be applied to the diversity of current and future farming operations and adhere to the definition of 'organic' which focuses on fostering biodiversity and cycling of nutrients on a site-specific basis.
- **Crop Rotation –** The crop rotation standard at 7 CFR 205.205 requires that producers rotate crops to achieve a series of outcomes: erosion control, nutrient cycling, disruption of pest and disease cycles, and soil organic matter management. In perennial systems, clearly the crop is not rotated from year to year, but producers comply with this requirement by implementing practices such as cover crops and hedgerows to ensure these same outcomes are achieved. Similarly, in some soil-based greenhouse operations, the same annual crop is replanted every year, but the producer achieves the same outcomes by implementing practices such as cover cropping and composting. We encourage CS to explore how containerized and greenhouse operations should manage their operations to ensure these same outcomes are achieved and provide guidance to the organic industry to ensure this critical element of the USDA organic regulations is applied appropriately to containerized and greenhouse production.

Microbial Ecosystems

As we described above, there did seem to be some consensus among the Hydroponic/Aquaponic Task Force that a complex microbial ecosystem is one of the hallmarks of soil-based organic agriculture that must be included in any soil-less system. We agree with this concept. Microbes are necessary to make organic fertilizers available to plants, and their population size and complexity will ultimately determine the success of the crops grown on any operation that relies on organic fertilizers. To this end, we suggest CS explore how the population size and complexity of microbes in various systems could be measured and quantified. Such a metric could be used as a non-arbitrary way to determine whether a soil-less production system aligns with OFPA and the USDA organic regulations. Similarly, by using a benchmark for microbial populations rather than a benchmark of container size or fertility regimen as the way to demonstrate compliance with organic regulations, the organic regulations will retain the flexibility needed to be applied to the whole spectrum of modern agriculture. Looking towards an appropriate microbial population standard will also help to clarify the 2010 recommendation on Production Standards for Terrestrial Plants in Containers and Enclosures (Greenhouses), which stated: "Growing media shall contain sufficient organic matter capable of supporting natural and diverse soil ecology. For this reason, hydroponic and aeroponic systems are prohibited." By developing a microbial standard, guidelines for containerized and greenhouse production will ensure these operations align with OFPA and the USDA organic regulations.

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Expert Panel

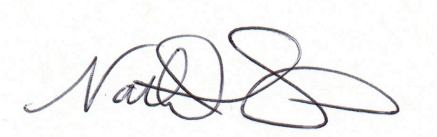
We urge CS to convene an expert panel at its next meeting to provide input into the critical issue areas that will form the foundation of a recommendation on containerized and greenhouse production. We believe NOSB, at a minimum, needs input from experts in the following areas: agronomy, soil biology, and organic fertilizer. Using the format of an expert panel at a public NOSB meeting will lay a strong foundation for any subsequent recommendation and reassure organic stakeholders that recommendations from NOSB are based on sound science.

Conclusion

We appreciate the gravity of the decisions currently before NOSB regarding 'bioponics' and containerized and greenhouse production. The issue has divided organic stakeholders, which underscores the need for NOSB to proceed thoughtfully and transparently. It appears that the Hydroponic/Aquaponic Task Force report fell short of its full mandate, and NOSB now must fill in the holes with input from the full organic stakeholder community. Moving forward hastily with an underdeveloped proposal to allow 'bioponics' does not seem prudent at this juncture, and this proposal should be referred back to subcommittee for further refinement. Guidelines on containerized and greenhouse production are badly needed, and we support CS' ongoing work. However, we are concerned that CS has made some unwarranted assumptions about fertility management in these systems, and we believe that the process of developing these guidelines will benefit from input from an expert panel at a future NOSB meeting.

On behalf of our members across the supply chain and the country, OTA thanks the National Organic Standards Board for the opportunity to comment, and for your commitment to furthering organic agriculture.

Respectfully submitted,



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cc: Laura Batcha
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