



# CCOF

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Ms. Michelle Arsenault  
Advisory Committee Specialist  
National Organic Standards Board, USDA-AMS-NOP  
1400 Independence Ave. SW., Room 2642-S, Mail Stop 0268  
Washington, DC 20250-0268

Docket: AMS-NOP-17-0024-0001

Re: Crops Subcommittee: Crops Subcommittee Proposal: Hydroponics and Container-Growing  
Recommendations & Crops Subcommittee Discussion Document: Field and Greenhouse Container Production

Dear Ms. Arsenault and NOSB Members,

Thank you for the opportunity to comment on the Hydroponics and Container-Growing Recommendations proposal and the Field and Greenhouse Container Production discussion document.

CCOF is a nonprofit organization governed by the people who grow and make our food. Founded in California more than 40 years ago, today our roots span the breadth of North America. We work to advance organic agriculture for a healthy world.

Attached are comments on the proposal (p.2) and discussion document (p.7). CCOF sincerely thanks the subcommittee members for attempting to find a resolution on this challenging topic. However, CCOF opposes the majority proposal because it would broadly prohibit hydroponic systems and create overly prescriptive, unachievable standards. While CCOF appreciates the minority's efforts to clarify the 2010 NOSB recommendation, it should further revise its proposal to ensure meaningful standards that distinguish organic container systems from their conventional counterparts.

Also attached are CCOF's proposed standards for container-based production systems, which we define as including hydroponic and aquaponics systems (p.8). CCOF incorporated input from a range of stakeholders and its own unique expertise in certifying container systems to draft comprehensive standards that, if implemented, would ensure container systems uphold organic integrity. CCOF would welcome the opportunity to refine our proposed standards with the NOSB and other stakeholders.

Thank you for considering our comments. Please do not hesitate to contact me for more information.

Sincerely,

Kelly Damewood  
Director of Policy and Government Affairs

cc: Cathy Calfo, Executive Director/CEO  
Jake Lewin, President, CCOF Certification Services, LLC

## CCOF Comment on the Crops Subcommittee Proposal: Hydroponics and Container-Growing Recommendations

Overall, CCOF opposes the Subcommittee's proposal because it would arbitrarily eliminate a swath of container production systems, including hydroponic and aquaponics operations, that otherwise meet organic standards and align with organic principles. We offer the following comments to inform the full Board's deliberations.

### A. Hydroponic systems are not inherently better or worse than in-ground systems.

The NOSB should shift its focus from arguing for and against the merits of hydroponic systems and accept that, like in-ground systems, there are varying degrees of sustainability and quality which can be addressed through implementation of clear standards. Based on our experience certifying over 3,400 farms throughout the U.S, including about 130 container-base systems, a range of factors contribute to the sustainability, quality, and viability of any organic operation.

#### 1. Hydroponic systems are not inherently better than in-ground systems.

It is unfortunate that the majority was compelled to spend time in the proposal defending in ground production. As the minority proposal notes, stakeholders who appreciate the value of hydroponic systems are also "pro-soil." There should be no question that, depending on the circumstances, in-ground production is capable of conserving water, managing food safety, protecting worker health, providing food to urban areas, and contributing other benefits cited by container growers. CCOF does not support any claim that hydroponic and container systems are universally better than in ground production. Rather, growers must use systems that best address *their* economic, regional, and agronomic growing conditions. As the minority proposal puts it: "[h]ydroponics *can* be an appropriate way to address challenges." (emphasis added)

#### 2. Hydroponic systems are not inherently worse than in ground systems.

The majority proposal questions hydroponic practices by weaving confusing arguments throughout the discussion section. Overall, the majority is correct that hydroponic systems are not perfect, but it fails to acknowledge that in-ground production can also have drawbacks. Moreover, the majority makes bold assumptions without weighing all factors or supplying sufficient evidence. Again, a wide range of factors impact the overall value of any given system.

For example, the proposal implies that hydroponic crops are less nutritious. Specifically, it refers to "unnatural problematic mineral nutrient accumulation." The majority offers no citations to support the assertion that hydroponically grown crops are consistently less nutritious than in-ground crops. And it fails to acknowledge that crops grown in ground also have varying nutritional qualities depending upon the practices and site conditions. For example, studies show that using shade cloth can impact nutrient composition of crops grown in soil. Would the NOSB propose to regulate the use of shade cloth on that basis?

The proposal also implies that hydroponic systems are less sustainable because they may import and transport fertility inputs. However, some hydroponic operations use renewable energy. In fact, at least one certified organic hydroponic operation is one of the few, and perhaps the only, carbon-neutral farm in the U.S. It

is also important to understand that hydroponic growers often use significantly less inputs per crop grown for their site specific conditions—that is, they would use more inputs to produce the same amount of crops if they were growing in ground. Moreover, in-ground growers also use inputs sourced from around the world. Thus, hydroponic is not better or worse—all growers should improve energy use and input sourcing to ensure they mitigate for impacts to natural resources.

Another strange point is the implication that hydroponic systems are less resilient than in-ground systems. For nearly 6 years, California growers were devastated by drought. Container growing actually helped these growers be resilient to these conditions. Over the past year, numerous fields have been wiped out by flooding and fire. So how is one type of challenge—such as a power outage that could be caused by a storm—less acceptable than the challenge of overcoming drought or flooding?

Finally, the proposal claims that hydroponic systems use more energy altogether. The energy usage of hydroponic systems is important to address because it impacts natural resources. As noted above, some hydroponic growers use renewable energy, and the standards should push all producers to do so. In fact, the standards should push all organic operations, including handlers, to account for impacts to natural resources through their energy usage.

It is also relevant to consider that hydroponic growers often use less, if any, gas and diesel. And by using hydroponic systems to supply local produce to areas otherwise unable to support food production—such as urban farms and rooftop gardens—some growers significantly reduce the energy footprint of their farms. So hydroponic systems are not inherently better or worse because of their energy usage; rather, a number of factors determine overall impacts to natural resources.

In sum, hydroponic systems are not perfect. But neither are in-ground systems. So rather than make conclusive, one-sided assumptions, the NOSB should recommend meaningful standards to address these important issues for all systems.

## B. The NOSB should not dismiss impacts to existing operations.

It is concerning that the majority dismisses concerns that certified operations would lose certification because “the numbers would be quite small relative to the total number of operations certified through the NOP.” The proposal would not only decertify a swath of container systems, but also it would impact the consumers and communities who rely on those growers. For example, numerous military veterans cycle through a southern California organic farming training program at an organic hydroponic farm and school. Kicking this operation out of organic certification would impact all past, current, and future veteran students who seek to learn about organic agriculture. And it would impact all the local consumers who purchase their organic produce at local farmers markets and retail outlets. In other words, the impact would be more significant than is implied in the majority’s proposal.

Moreover, the argument that an action would impact relatively few operations is a conventional argument. We see state and federal agencies make the argument that it is okay to deregulate a GMO or mandate a statewide conventional pest treatment because there are relatively few organic farms in proportion to total farms. If the argument held true that government advisory bodies should not consider impacts to proportionally small amounts of farms, then organic would almost always have no case to make when advocating for resources and protections for organic farms. Therefore, the NOSB should not dismiss the impacts to existing operations, even if they are a relatively small portion of organic production.

### C. The NOSB should consider requiring labels on container-grown products.

The NOSB has yet to host a robust discussion on labeling requirements. While the minority proposal briefly mentions the need to consider labels, it does not make a clear call for proposals.

CCOF supports a labeling requirement for container systems, including hydroponic and aquaponics systems. This is not an easy position to take because a labeling requirement has numerous drawbacks. For example, it creates logistical challenges for developing labels, especially for growers who use both in-ground and container systems. And, generally, it is not best practice to single out any single type of operation that is in compliance with organic standards because it may cause consumer confusion. Nonetheless, some organic stakeholders are concerned about misleading consumers who may expect organic crops to be grown in in-ground systems. A label requirement, coupled with strong standards, could resolve this concern by promoting consumer choice without broadly excluding existing and future operations from organic certification.

To assist the NOSB in considering labeling options, CCOF encourages the Board to consider its proposed labeling requirement in section §205.303(c) of its proposed standards (p. 12-13). CCOF proposes a broad requirement that all container systems include a label on fresh market produce in packages, and the producer must choose whether to label their product as container grown or hydroponically grown.

Given the deep philosophical divide on this topic and the ongoing debate, which likely confuses consumers now, it is worthwhile to at least consider whether a label could reconcile divergent opinions where other efforts have failed. Therefore, the NOSB should host a robust discussion and public comment on labeling.

### D. Comments on Specific Crops Subcommittee Proposed Recommendations

CCOF offers the following comments on the majority and minority's specific proposals.

#### 1. Majority

- *Aeroponics*

CCOF does not certify any aeroponic operations, and we do not have a thorough understanding of these systems. Generally, we encourage the NOSB to recommend standards rather than broad prohibitions. It is also unclear why minority members support inclusion of hydroponic but not aeroponic systems.

- *Aquaponics*

CCOF does not support a broad prohibition of aquaponics systems. There are existing certified organic aquaponics systems which are in compliance with organic standards. Additionally, we are not aware of food safety issues unique to aquaponics systems that cannot be addressed through compliance with retailer requirements, third-party audits, and compliance with federal standards. Moreover, given the complex rulemaking process, it is highly unrealistic to suggest that the NOP can decertify these systems now and later re-allow them.

- *Hydroponics and Container Growing*

CCOF opposes the proposal to limit container production systems to feed 20% of the plant's nitrogen by liquid feeding and a limit of 50% to be added to the container after the crop has been planted. These numbers are not only arbitrary, but they also impose overly prescriptive limitations that will merely require producers to jump through hoops rather than ensure organic integrity.

This requirement will create confusing calculations and certifiers will be extremely challenged to verify such requirements. The NOSB should reevaluate the goal of limiting liquid feed. If container growers can still grow successful crops without the use of harmful inputs, without damaging natural resources, and while also facilitating biodiversity and otherwise complying with organic standards, then it is arbitrary to limit their ability to provide nutrients to their plants.

CCOF also opposes the proposal's attempt to define hydroponics in relation to what it is not, especially the attempt to define it as not meeting liquid feeding and nitrogen requirements. The NOSB should work to distinguish organic hydroponic systems from their conventional counterparts through enforceable standards rather than propose broad prohibitions.

## 2. Minority

- *Definition of hydroponics*

CCOF opposes the inclusion of the term "inert" in the definition of hydroponics because it negates the diverse biological and microbial activity that organic hydroponic growers cultivate in their systems. CCOF offers an alternative definition in the attached standards (p.9).

- *Trophic levels*

CCOF opposes a prescriptive trophic level testing requirement. Trophic testing might be one way to demonstrate diverse biological and microbial activity. However, producers should also have the option to demonstrate compliance through other means such as incorporating compost or requiring inspectors to look for frogs, spiders, worms, and other biological activity.

As an alternative to mandatory trophic level testing, the NOSB should consider CCOF's proposed standard in section § 205.203 (e). In addition to this standard, the NOP should also issue guidance clarifying how producers can demonstrate biological and microbial activity. CCOF's proposed standard, coupled with NOP guidance, would be more appropriate for regulatory language than a prescriptive trophic testing requirement.

If NOSB moves forward with a trophic testing requirement, it is critical that they consider the impacts to small- and mid-scale producers. While larger operations may already do trophic testing and can afford to send samples to labs, it is unclear whether sufficient labs are available at reasonable costs to all scales of growers.

- *Carbon-based media*

A requirement for 50% carbon-based media is likely achievable. Some producers, like aquaponics producers, may have to incorporate the carbon-based media into their digesters. However, it would be helpful to have a clear explanation as to what the goal is for requiring 50% carbon-based media and how the requirement achieves the goal. Generally, prescriptive, arbitrary percentage requirements result in challenging calculations and confusing verification requirements. They also limit the ability of growers to innovate and adapt their systems to best suit their economic, regional, and agronomic conditions.

- *Recycling and reusing containers*

CCOF supports requiring container producers to recycle and reuse containers. Notably, the vast majority of container producers already meet this requirement.

# CCOF Comment on the Crops Subcommittee Discussion Document: Field and Greenhouse Container Production

CCOF offers the following comments in response to the NOSB's discussion questions and encourages the Subcommittee to review the attached draft standards (p. 19-13), which attempt to address these issues.

1. No. Limiting artificial light to a specific number of hours per day is overly prescriptive. We agree that natural light should be used when possible because artificial light may impact natural resources unless the grower use renewable energy. We recommend that growers use natural light when possible and mitigate for impacts to natural resources. We understand that "when possible" leaves room for interpretation. But guidance could clarify conditions where artificial lighting is acceptable.

Moreover, the NOSB should keep in mind that organic handlers use artificial lighting. Certifiers currently cannot require handlers to mitigate their energy usage. So by addressing the use of lighting on the farm, we may also have the opportunity to require all producers to mitigate for the impacts of artificial lighting.

Finally, the comparison of artificial light to hormones is extremely odd. Hormones damage the welfare of the animal. Are we proposing that plants have a welfare that needs protecting in the same way that an animal does? If so, would this not raise many strange questions about such practices as tilling, pruning, and the use of fertilizers?

2. Absent evidence that the types of light impacts natural resources or the ability of growers to comply with the standards, CCOF does not recommend limiting the types of lighting.
3. Some container growers use synthetic mulches while others till between rows, and some may use other techniques. There is ongoing research and development on weed management in container systems. In all cases, producers must manage the entire production site organically, including maintaining or improving soil health under the mulches and containers.

NOP Guidance, rather than a specific standard, would best address runoff or erosion issues with synthetic mulches. Guidance could address the use of straw, wood chips, hay, etc. And it could address how certifiers monitor the use of large amounts of synthetic mulch to ensure that any impacts to beneficial insects and birds are mitigated.

CCOF has already taken steps to increase evaluation of soil health for all systems at annual inspections and is implementing the relatively new Natural Resources and Biodiversity Guidance (NOP 5020). We encourage all certifiers to address any issues with synthetic mulch under their current authority.

4. Yes. Container producers should be required to recycle and reuse spent media, recycle containers, and manage excess nutrient water to ensure compliance with 205.203(c).

## CCOF Proposed Standards for Container Systems

CCOF offers the attached proposed standards for container production systems, which we define as including hydroponic and aquaponics systems. In developing the standards, we used three guiding principles:

First, wherever possible, the NOP should apply existing standards to container systems to ensure fair and consistent requirements among all producers.

Second, the NOP should develop new standards to address any potential impacts of container systems when the impacts may not align with organic practices.

Finally, we are not proposing a compromise or attempting to simply codify what container growers are already doing; rather, we are proposing what we consider strong standards to ensure all container systems rise to the level of integrity consumers expect from organic production.

A summary of CCOF's proposed standards are as follows:

1. Define "Container System" as "any production system of normally terrestrial, vascular plants in containers, except for mushrooms, transplants, sprouts, sprouted fodder, and aquatic plants. Container Systems include but are not limited to rooftop gardens, aquaponic systems, and hydroponic systems."
2. Define "Hydroponic" as a "container system where the majority of the plant's root structure is in water."
3. Clarify that container systems meet crop rotation requirements through the same practices as perennial crops, e.g. alley cropping, intercropping, and hedgerows.
4. Clarify that a container system must have biological diversity, nutrient cycling, and microbial activity.
5. Clarify that the entire production site, including land in and around the production facility must be managed organically.
6. Require recycling and reuse of containers and spent media as well as management of excess nutrient water.
7. Require the use of natural light when possible, and require mitigation of impacts to natural resources when using artificial lighting (such as sourcing renewable energy and implementing energy efficiency practices). CCOF adopts the term electric lighting from the 2016 Hydroponic and Aquaponic Task Force Report.
8. Require raw agricultural commodities in packages (not processed foods), which have been produced from a container system to include one of the following labeling statements: "container grown," "hydroponically grown," "aquaponically grown."



# CCOF Proposed Standards for Container Systems

National Organic Standards in black, CCOF proposed text in red:

§205.2 Terms defined:

*Aquaponics. A recirculating hydroponic system in which plants are grown in nutrients originating from aquatic animal waste water, which may include the use of bacteria to improve availability of these nutrients to the plants. The plants improve the water quality by using the nutrients, and the water is then recirculated back to the aquatic animals.*

*Aeroponics. A variation of hydroponics in which plant roots are suspended in air and misted with nutrient solution.*

*Container. Any vessel and associated equipment used to house growing media and the complete root structure of terrestrial plants and to prevent the roots from contacting the soil or surface beneath the vessel, such as, but not limited to, pots, troughs, plastic bags, and floor mats.*

*Container System. Any production system of normally terrestrial, vascular plants in containers, except for mushrooms, transplants, sprouts, sprouted fodder, and aquatic plants. Container Systems include but are not limited to rooftop gardens, aquaponic systems, and hydroponic systems.*

**Crop Rotation.** The practice of alternating the annual crops grown on a specific field in a planned pattern or sequence in successive crop years so that crops of the same species or family are not grown repeatedly without interruption on the same field. Perennial cropping systems *and container systems* employ means such as *rotating containers between crops to prevent buildup of pathogens*, alley cropping, intercropping, and hedgerows to introduce biological diversity in lieu of crop rotation.

*Electric lighting. Fixtures and lamps used to provide photosynthetically active radiation (PAR). Examples include but are not limited to high pressure sodium, metal halide, fluorescent, and light emitting diodes (LED).*

*Greenhouse. Permanent enclosed structure that allows for an actively controlled environment used to grow organic crops, annual seedlings or planting stock used in organic production.*

*Growing media. Material which provides sufficient support for the plant root system and enables the plant to extract water and nutrients. Used interchangeably with the term "substrate".*

*Hydroponic. A container system where the majority of the plant's root structure is in water.*

*Soil. The outermost layer of the earth comprised of minerals, water, air, organic matter, and living organisms, in which plants grow.*

*Raw agricultural commodity. Any food in its raw or natural state, including all fruits that are washed, colored, or otherwise treated in their unpeeled natural form prior to marketing (Federal Food, Drug, and Cosmetic Act, 21 U.S.C. § 321 (r)). Substances used for coloring or coating must be permitted as per § 205.605 or § 205.605 of the National List.*

§205.202. Land requirements:

Any field or farm parcel from which harvested crops are intended to be sold, labeled, or represented as "organic," must:

- (a) Have been managed in accordance with the provisions of § 205.203 through § 205.206;
- (b) Have had no prohibited substances, as listed in § 205.105, applied to it for a period of 3 years immediately preceding harvest of the crop; and
- (c) Have distinct, defined boundaries and buffer zones such as runoff diversions to prevent the unintended application of a prohibited substance to the crop or contact with a prohibited substance applied to adjoining land that is not under organic management.

§205.203. Soil fertility and crop nutrient management practice standards:

- (a) The producer must select and implement tillage and cultivation practices that maintain or improve the physical, chemical, and biological condition of soil and minimize soil erosion.
- (b) The producer must manage crop nutrients and soil fertility through rotations, cover crops, and the application of plant and animal materials.
- (c) The producer must manage plant and animal materials to maintain or improve soil organic matter content in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, pathogenic organisms, heavy metals, or residues of prohibited substances. Animal and plant materials include:
  - (1) Raw animal manure, which must be composted unless it is:
    - (i) Applied to land used for a crop not intended for human consumption;
    - (ii) Incorporated into the soil not less than 120 days prior to the harvest of a product whose edible portion has direct contact with the soil surface or soil particles; or
    - (iii) Incorporated into the soil not less than 90 days prior to the harvest of a product whose edible portion does not have direct contact with the soil surface or soil particles;
  - (2) Composted plant and animal materials produced through a process that
    - (i) Established an initial C:N ratio of between 25:1 and 40:1; and
    - (ii) Maintained a temperature of between 131 F and 170 F for 3 days using an in-vessel or static aerated pile system; or
    - (iii) Maintained a temperature of between 131F and 170F for 15 days using a windrow composting system, during which period, the materials must be turned a minimum of five times.
  - (3) Uncomposted plant materials.

(d) A producer may manage crop nutrients and soil fertility to maintain or improve soil organic matter content in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, pathogenic organisms, heavy metals, or residues of prohibited substances by applying:

(1) A crop nutrient or soil amendment included on the National List of synthetic substances allowed for use in organic crop production;

(2) A mined substance of low solubility;

(3) A mined substance of high solubility, Provided, That, the substance is used in compliance with the conditions established on the National List of nonsynthetic materials prohibited for crop production;

(4) Ash obtained from the burning of a plant or animal material, except as prohibited in paragraph (e) of this section: Provided, That, the material burned has not been treated or combined with a prohibited substance or the ash is not included on the National List of nonsynthetic substances prohibited for use in organic crop production; and

(5) A plant or animal material that has been chemically altered by a manufacturing process: Provided, That, the material is included on the National List of synthetic substances allowed for use in organic crop production established in § 205.601.

*(e) A container system must include biological diversity, nutrient cycling, and microbial activity.*

*(f)* The producer must not use:

(1) Any fertilizer or composted plant and animal material that contains a synthetic substance not included on the National List of synthetic substances allowed for use in organic crop production;

(2) Sewage sludge (biosolids) as defined in 40 CFR Part 503; and

(3) Burning as a means of disposal for crop residues produced on the operation: *Except*, That, burning may be used to suppress the spread of disease or to stimulate seed germination.

#### §205.205 Crop rotation practice standard.

The producer must implement a crop rotation including but not limited to sod, cover crops, green manure crops, and catch crops that provide the following functions that are applicable to the operation:

(a) Maintain or improve soil organic matter content;

(b) Provide for pest management in annual and perennial crops;

(c) Manage deficient or excess plant nutrients; and

(d) Provide erosion control.

*§205.208. Container Systems Natural Resources Standard.*

*(a) The entire production site, including in and around the production facility as well as land beneath containers, must be managed to conserve biodiversity and maintain or improve natural resources of the site-specific conditions.*

*(1) Managing Excess Nutrient Water: Excess drainage of plant nutrient water must be managed in compliance with 205.203(c).*

*(2) Recycling Containers: Containers must be reused and recycled.*

*(3) Recycling and Reusing Spent Media: Growing media must be composted, recycled, or reused.*

*(4) Lighting:*

*(i) Container systems must use natural daylight as the primary source of light when possible given the site-specific conditions. Electric lighting may be used to supplement natural daylight.*

*(ii) If a producer operating a container system cannot use natural daylight as the primary source of light, then the producer shall mitigate for impacts to natural resources through such practices as sourcing renewable energy, implementing energy efficiency practices, and undergoing annual energy audits.*

§205.303 Packaged products labeled “100 percent organic” or “organic.”

(a) Agricultural products in packages described in § 205.301(a) and (b) may display, on the principal display panel, information panel, and any other panel of the package and on any labeling or market information concerning the product, the following:

(1) The term, "100 percent organic" or "organic," as applicable, to modify the name of the product;

(2) For products labeled "organic," the percentage of organic ingredients in the product; (The size of the percentage statement must not exceed one-half the size of the largest type size on the panel on which the statement is displayed and must appear in its entirety in the same type size, style, and color without highlighting.)

(3) The term, "organic," to identify the organic ingredients in multiingredient products labeled "100 percent organic";

(4) The USDA seal; and/or

(5) The seal, logo, or other identifying mark of the certifying agent which certified the production or handling operation producing the finished product and any other certifying agent which certified production or handling operations producing raw organic product or organic ingredients used in the finished product: Provided, That, the handler producing the finished product maintain records, pursuant to this part, verifying organic certification of the operations producing such ingredients, and: Provided further, That, such seals or marks are not individually displayed more prominently than the USDA seal.

(b) Agricultural products in packages described in § 205.301(a) and (b) must:

(1) For products labeled "organic," identify each organic ingredient in the ingredient statement with the word, "organic," or with an asterisk or other reference mark which is defined below the ingredient statement to indicate the ingredient is organically produced. Water or salt included as ingredients cannot be identified as organic.

(2) On the information panel, below the information identifying the handler or distributor of the product and preceded by the statement, "Certified organic by...," or similar phrase, identify the name of the certifying agent that certified the handler of the finished product and may display the business address, Internet address, or telephone number of the certifying agent in such label.

*(c) Raw agricultural commodities in packages which have been produced from a container system must include an eligible production statement.*

*(1) Eligible statements include:*

*(i) Container grown*

*(ii) Hydroponically grown*

*(iii) Aquaponically grown*