



# BEYOND PESTICIDES

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Room 2648-S, Mail Stop 0268  
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**Docket ID # AMS-NOP-19-0095**

## **Re. CS, CACS: Organic integrity, soil**

These comments to the National Organic Standards Board (NOSB) on its Spring 2020 agenda are submitted on behalf of Beyond Pesticides/OrganicEye. Founded in 1981 as a national, grassroots, membership organization that represents community-based organizations and a range of people seeking to bridge the interests of consumers, farmers and farmworkers, Beyond Pesticides advances improved protections from pesticides and alternative pest management strategies that reduce or eliminate a reliance on pesticides. Our membership and network span the 50 states and the world. OrganicEye is a project of Beyond Pesticides and acts as our investigative arm.

We have previously shared comments on hydroponics and container production with the NOSB. Since there have been several additions to the NOSB since then, we repeat some of those comments below.

Soil is central to organic production. Therefore, hydroponic operations should not be considered eligible for organic certification. The NOSB should take a clear position in opposition to hydroponics and other non-soil-based methods in organic production, including containers.

## **Foundations of Organic Production**

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.<sup>1</sup> Together these three principles describe a production system that mimics natural systems. 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

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<sup>1</sup> See Sir Albert Howard. *The Soil and Health: The Study of Organic Agriculture* (1940), and *An Agricultural Testament* (1947).

that the cash crop removes nutrients, they must be replaced by cover crops, crop rotation, or additions of off-site materials, when necessary.

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.

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).

At the time of the passage of the Organic Foods Production Act (OFPA), the organic community’s characterization of soil as alive was viewed with amusement by the “conventional” agriculture experts, who saw soil as a structure for supporting plants, while farmers poured on synthetic nutrients –and the poisons that had become necessary to protect the plants growing without the protection of their ecological community. Interestingly, organic producers at that time compared conventional agriculture to hydroponics.

Conventional agriculture has now learned something about soil life—enough to promote increasing use of cover crops. On a parallel track, practitioners of hydroponics have learned the value of biology in their nutrient solutions. However, in both cases, the lessons have not been completely understood.

A quote from the *Omnivore’s Dilemma* (2006) by Michael Pollan can help give us some perspective on the importance of organic as envisioned by the pioneers of the practices and the drafter of OFPA:

To reduce such a vast biological complexity to NPK represented the scientific method at its reductionist worst. Complex qualities are reduced to simple quantities; biology gives way to chemistry. As [Sir Albert] Howard was not the first to point out, that method can only deal with one or two variables at a time. The problem is that once science has reduced a complex phenomenon to a couple of variables, however important they may be, the natural tendency is to overlook everything else, to assume that what you can measure is all there is, or at least all that really matters. When we mistake what we can know for all there is to know, a healthy appreciation of one’s ignorance in the face of a mystery like soil fertility gives way to the hubris that we can treat nature as a machine.

The ecological system of a hydroponic nutrient system is revealed in the Hydroponic and Aquaponic Subcommittee (HASC)<sup>2</sup> report to be more like a fermentation chamber—a means of processing plant nutrients—than the soil ecosystem of an organic farm. To see this, we can look at the three principles mentioned above.

**The Law of Return.** In a soil-based system, residues are returned to the soil by tillage, composting, or mulching. In a hydroponic system, the residues may be composted, but none of the case studies describes how the residues are returned to the hydroponic system, closing the loop. We note that the HASC identifies some inputs used in hydroponics.<sup>3</sup> They include many products/byproducts of chemical-intensive agriculture—animal-based compost, soy protein, molasses, bone meal, alfalfa meal, plant-based compost, hydrolyzed plant and animal protein, composted poultry manure, dairy manure, blood meal, cottonseed meal, and neem seed meal—and these are produced off-site, with no return to their production system.

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.

**Feed the soil, not the plant.** The HASC report reveals how much hydroponics rely on added plant nutrients. These nutrients may be made available through biological processes, but they are added to feed the plants, not the ecosystem. The case study of hydroponic tomatoes in the Hydroponics Task Force Report, for example, says,

After planting the seedlings in this growing media, it is necessary to add supplemental nutrition throughout the growing cycle (approximately one year). About once per week, solid and liquid nutrients are added to the growing media. Some fertilizer can be applied through the irrigation lines because they are soluble enough and will not clog the lines. The use of soluble nitrogen fertilizers is limited because of their high costs, for instance for plant-based amino acids. As long as the sodium nitrate rule continues to apply, it will be used as a lower cost nitrogen source. Soluble organic-compliant inorganic minerals are also added through the irrigation system, such as potassium and magnesium sulfate.

**Biodiversity.** The definition of “organic production” in the organic regulations requires the conservation of biodiversity. As stated in the NOP Guidance on Natural Resources and Biodiversity Conservation (NOP 5020),

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<sup>2</sup> Hydroponic and Aquaponic Task Force, 2016. The task force “report” is actually two reports under one cover – two reports written by subcommittees with very different viewpoints– the 2010 NOSB Recommendation Subcommittee (2010 SC) and the Hydroponic and Aquaponic Subcommittee (HASC). The former represents the viewpoint that organic production must be in the soil, and the second promotes certification of “organic” hydroponics.

<sup>3</sup> See table on p. 23 of HASC report.

The preamble to the final rule establishing the NOP explained, “[t]he use of ‘conserve’ [in the definition of organic production] establishes that the producer must *initiate practices to support biodiversity and avoid, to the extent practicable, any activities that would diminish it*. Compliance with the requirement to conserve biodiversity requires that a producer incorporate practices in his or her organic system plan that are beneficial to biodiversity on his or her operation.” (76 FR 80563) [Emphasis added.]

Thus, it is not enough for a hydroponics producer to say it is not diminishing soil and plant biodiversity –the operation must take active steps to support biodiversity. On a soil-based organic farm, many practices support biodiversity –from crop rotations to interplanting to devoting space to hedgerows and other non-productive uses. Many of these practices can and should be used by farmers producing food in greenhouses. However, the case studies provided by the HASC are evidence that bioponics is a monocultural environment that does not support biodiversity.

**Aquaponics.** Aquaponics differs from hydroponics in several respects. Animal wastes produced by the system are used to feed plants. There is more biodiversity because there are both plants and animals. However, the system is strongly dependent on fish feed coming from outside the system. As with hydroponics, the Law of Return is violated for the production of the animal feed. If fish feed were produced on-site using recycled water and nutrients plants grown using fish waste, then we would be more inclined to see possibilities for organic aquaponics. There is also more possibility of a system with biodiversity and soil ecology, but that is not reflected in the case history presented in the report. However, it should be noted that the use of raw manure in growing terrestrial vegetables is highly regulated in organic systems.

## **Fraud prevention and enforcement is essential to the integrity of the organic label.**

It is absolutely essential to any government or private standard setting process that enforcement and compliance is operating effectively and trusted by the public. Without an effective enforcement system, the value of the USDA organic label is undermined in the market. Whether related to imported or domestically grown food, enforcement against fraud and an assurance of compliance with organic standards is critical to the ongoing growth and stability of the organic market. Fraud is a problem when, for example, crops are grown with prohibited inputs, when livestock do not get the required access to pasture, and when crops are produced in artificial media and, therefore, not in compliance with organic standards.

Consumer trust and organic farmer and handler investments are jeopardized by ineffective oversight and enforcement of organic standards by USDA. USDA and accredited organic certifying agents are generally meeting expectations, but the enforcement process has fallen short in several instances, and additional actions are needed to safeguard the integrity of the organic label. We appreciate that organic producers are subject to much more rigorous oversight than their counterparts in chemical-intensive or “conventional” production and

processing. This is understandable given the high level of organic consumer expectation and the market premium. However, it is critical that we address any compliance limitations of the organic certification system when it occurs and ensure corrective action in a timely fashion with full transparency. Without this kind of response, public trust in the organic food label will suffer dramatically. Additionally, to the extent that the enforcement system is known to be highly rigorous, it will decrease the likelihood of aberrant behavior.

### **Hydroponics violates organic standards.**

Contrary to a 2010 recommendation by the NOSB, NOP has been allowing hydroponics operations to be certified as organic. This reversal of an NOSB decision without any new scientific information undermines the NOSB process and will have a devastating long-term impact on the credibility of the organic label. In response, organic stakeholders, including growers, consumers, processors, and retailers, have come together around an add-on label that will inform consumers that their organic food has been grown in the soil and managed in accordance with the intent and spirit of Organic Foods Production Act, which requires that organic growers “foster soil fertility, primarily through the management of the organic content of the soil through proper tillage, crop rotation, and manuring.” This add-on label will provide transparency so that consumers can be assured that farmers are engaged in the practices of soil-based agriculture, which are foundational to the principles and values integral to the law.

Those engaged in developing the add-on label are following the long history and legal standards of the organic law, building on its foundation and utilizing the marketplace to enable consumers to make decisions aligned with organic principles and values. To the extent that the NOSB advances an agenda that is divergent from the law with NOP oversight, the program will become increasingly irrelevant, as market forces respond to consumer expectations. And, should USDA seek to change the law, it will inflict grave harm to the value of the USDA organic label.

From its very beginnings, the organic sector has been driven by an alliance of farmers and consumers 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. These standards, integral to organic, certainly do not preclude the adoption of other methods that can identify themselves as offering other assets, but adherence to the principles of organic cannot be compromised if we are to sustain the organic market in the future. So, from this perspective, we have a serious fraud and enforcement problem with the current allowance of certified organic hydroponic production.

Thank you for your consideration of these comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Jessica Ann Hirt". The signature is fluid and cursive, with a long horizontal stroke at the end.

Terry Shistar, Ph.D.  
Board of Directors