

National Organic Standards Board (NOSB)
Crops Committee Recommendation

Production Standards for Terrestrial Plants in Containers and Enclosures (Greenhouses)

January 23, 2010

I. Introduction:

This recommendation for rulemaking addresses certain aspects of greenhouse production that are commonplace in indoor cropping methods, such as container based rooting media (potting mixtures), hydroponics, and aeroponics. Additionally, provisions are put forth to protect against contamination and commingling of organic crops by non-organic crops in the same greenhouse structure or adjacent ones.

II. Background

In May 2009 the Crops Committee presented for discussion a document clarifying the NOSB's position on soil-less growing systems, such as hydroponics, as they pertain to organic certification to the USDA National Organic Program standards. The present recommendation focuses on greenhouse production, but it is based on the same criteria and principles outlined in the soil-less systems document.

III. Discussion

The organic farming method derives its name from the practice of maintaining or improving the organic matter (carbon containing) content of farm soil through various methods and practices. The reason this is the central theme and foundation of organic farming is not inherent to the organic matter itself, but is based on the importance of the organic matter to the living organisms that inhabit soils, particularly for its positive influence on proliferation of diverse populations of organisms that interact in a beneficial way with plant roots. These microscopic organisms, found in abundance in well maintained soils, interact in a symbiotic manner with plant roots, producing the effect of strengthening the plant to be able to better resist or avoid insect, disease and nematode attack, as well as assisting the plant in water and mineral uptake. The abundance of such organisms in healthy, organically maintained soils form a biological network, an amazing and diverse ecology that is 'the secret', the foundation of the success of organic farming accomplished without the need for synthetic insecticides, nematicides, fumigants, etc. In practice, the organic farmer is not just a tiller of the soil, but a steward of the soil ecology on the farm, hence some of the alternate names for this realm of production, such as ecological or biodynamic farming.

Observing the framework of organic farming based on its foundation of sound management of soil biology and ecology, it becomes clear that systems of crop production that eliminate soil from the system, such as hydroponics or aeroponics, can not be considered as examples of acceptable organic farming practices. Hydroponics, the production of plants in nutrient rich solutions or moist inert material, or aeroponics, a variation in which plant roots are suspended in air and continually misted with nutrient solution, have their place in production agriculture, but certainly cannot be classified as certified organic growing methods due to their exclusion of the soil-plant ecology intrinsic to organic farming systems and USDA/NOP regulations governing them.

IV. Relevant Areas in the Rule

The OFPA specifically required an organic plan designed to foster soil fertility (§6513b) and the NOP regulations resulting from the Act bear this out as follows:

§205.203(a)- The producer must select and implement tillage and cultivation practices that maintain or improve the physical, chemical, and biological condition of the soil.

§205.203(b)- The producer must manage crop nutrients and soil fertility through rotations, cover crops, and the application of plant and animal materials.

§205.203(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...

Although the regulations do not specifically state 'soil only production', the exclusion of soil from organic production of normally terrestrial, vascular plants violates the intent of the regulations. This intent can be seen in these sections of the rule that require proper stewardship toward improving and maintaining the soil ecology within an organic farming system. It is pointed out that naturally aquatic plant species and non-vascular plant species such as mushrooms come from different (non-soil) ecological niches and would be handled separately.

In previous Crops Committee discussion documents, the question has been asked: "Should container culture based growing media (typically utilized in greenhouse systems) that are predominately compost and compostable plant materials be considered 'soil'. As highlighted in earlier portions of this document, a foundational principle of organic farming is the practice of maintaining and nurturing soil health so as to foster the proliferation of the proper soil biology with their accompanying ecologies. Since all typical soil dwelling organisms, such as earthworms, protozoa, fungi, bacteria, actinomycetes, etc. can thrive in a properly designed compost based growing media, producing the beneficial symbiotic ecological relationships found in soil, such growing media should be rightfully considered soil.

V. Recommendation

§ 205.2 TERMS DEFINED

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.

Hydroponics- The production of normally terrestrial, vascular plants in nutrient rich solutions or in an inert, porous, solid matrix bathed in nutrient rich solutions.

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

Containers- 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, floor mats. etc.

Growing media- Material which contains sufficient organic matter capable of supporting the plant root system and a natural and diverse soil ecology.

205.209 **Greenhouse Production Systems**

(a) Greenhouse operations must meet all applicable requirements of subparts B (205.105) and C (205.200 – 205.206) except that:

- (1) The producer operating a greenhouse with crops grown in containers using a growing media that does not include soil from the production site is exempt from requirements of 205.202(b), 205.203(a).
- (2) In addition, the growing container based producer is exempt from the crop rotation and cover cropping requirements in section 205.203(b) and 205.205. In lieu of crop rotation and cover cropping, soil regeneration and recycling practices shall be implemented and documented for the certification agent in order to demonstrate that the required functions/goals of crop rotation and cover cropping listed in 205.205(a, b, c, d) have been achieved through these alternate practices, as applicable to the operation. Specifically:

- (i) Maintain or improve soil organic matter content (a)- Examples include, but are not limited to, recycling and re-use of growing media, addition of compost and other compostable materials, earthworm replenishment, microbial re-inoculation, etc.
- (ii) Provide for pest management in crops (b)- Such as soil borne damping-off control through various low temperature heating methods. Soil inoculation using disease suppressant bacteria and fungi.
- (iii) Manage deficient or excess plant nutrients (c)- Recycle excess plant nutrients contained in drain water from media containers, avoiding so called drain-to-waste systems. Recycled nutrients must be re-used in the greenhouse, or alternatively, on a growing crop outside the facility.
- (iv) Provide erosion control (d)- Though erosion is not generally applicable to greenhouse production, recycling of drain water prevents off-site movement of nutrients, a common consequence of typical field erosion.

(b) Growing media ingredients shall be verified by certifying agent and shall not include as ingredients any prohibited materials. Growing media shall be comprised of ingredients that allow for recycling and re-use as growing media within the operation, or alternatively, as a crop input outside the greenhouse. Growing media shall not be disposed of as waste, but should be recycled or reused whenever possible. Growing media shall contain sufficient organic matter capable of supporting natural and diverse soil ecology. For this reason, hydroponic and aeroponic systems are prohibited.

(c) Producers may use full-spectrum light sources.

(d) Producers may use supplemental CO₂

(e) Plants and soil shall not be in direct contact with, or indirect contact with condensates from, wood treated with prohibited materials that are used for greenhouse structures or frames of raised beds.

(f) To comply with the provisions of 205.201(a)(5) to prevent commingling and contamination, organic and non-organic crops can be grown within the same structure only if the following conditions are met:

- (1) An impermeable wall shall separate organic and non-organic production sites if prohibited materials are applied to the non-organic crop to ensure that cross contamination does not occur.
- (2) The ventilation systems must ensure that prohibited materials cannot drift, or be otherwise conveyed to the organic production area.
- (3) Separate watering systems must be established if prohibited fertilizers and/or pesticides are injected within the watering system.
- (4) Producers must ensure that no contamination occurs to the organic crop through cross-pollination with crops produced through genetic engineering
- (5) Soil mixing machines and other equipment used for non-organic crop production must be thoroughly cleaned prior to use in organic production.
- (6) Adequate physical facilities, as determined by the certifying agent, shall separate organic and non-organic crops and production materials in storage, production or holding areas.
- (7) Organic and non-organic crops and production areas must be conspicuously labeled.

Voting: Motion: Tina Ellor Second: Rigoberto Delgado Yes: 5 No: 0 Absent: 1 Abstain: 0