
Hydroponics: The End of Organic?

Sarah J. Morath

Organic farmers are generally thought of as a peaceful group. They are also seen as passionate advocates and a particular hydroponic controversy has solidified this image. On October 31, 2017, the day before the National Organic Standards Board (NOSB) biannual meeting, over 50 farmers and advocates took to the streets outside the meeting in Jacksonville, Florida. That same day, more than 14 similar marches took place across the United States. Organic farmers were pulled from their fields to the streets to show their support for a proposal to prohibit hydroponic crops from being labeled organic under the United States Department of Agriculture (USDA) National Organic Program (NOP). Many organic farmers argued that allowing hydroponics to carry the USDA organic seal would undermine the integrity of the NOP and would further allow industry to ride the coattails of the farmers who worked so hard to create it.

To the farmers' disappointment, the NOSB voted eight to seven against a recommendation to prohibit hydroponic crops from being labeled organic. This vote, which outraged "hard-core" organic farmers, was viewed as a vote for industry. Some have called this vote a "watershed" moment for the organic program. Others describe it as "killing" the NOP; organic farmers farm in soil, after all. Many farmers have threatened to leave the organic program they worked so hard to establish; others have created new movements like the Real Organic Project to reclaim organic standards from the USDA. All question the future of the USDA organic label. Will the hydroponic vote result in the USDA going one way, while the organic movement goes another? This article explores the statutory and regulatory background of organic labeling and the challenges, opportunities, and implications of fitting hydroponics into the organic framework.

Although the term "organic" is believed to have originated in Britain, American Jerome Rodale, the founder of *Organic Farming* magazine, coined the term in the United States in the 1940s. As part of the back-to-the-land movement of the 1970s, interest in organic farming practices grew and several states enacted organic certification laws to regulate this method of growing produce. These laws, however, varied from state to state and the lack of a uniform standard created consumer confusion and allowed for fraudulent marketing practices.

The enactment of the Organic Foods Production Act (OFPA), as Title XXI of the 1990 Farm Bill, was an effort to create consistent federal standards for both organic production and certification. 7 U.S.C. §§ 6501–6522 (2012). OFPA broadly defines "organically produced" food as "an agricultural product that is produced and handled in accordance with [the Act]." 7 U.S.C. § 6502. OFPA aims to establish national

standards governing organically produced products, to assure consumers that organically produced products meet a uniform standard, and to facilitate interstate commerce of organically produced products. 7 U.S.C. § 6501. The USDA secretary became responsible for establishing an "organic certification program for producers and handlers of agricultural products . . . produced using organic methods" described in the act. 7 U.S.C. § 6503.

The NOP certification program took over 12 years to finalize and provides process-based requirements for the production and handling of food to be labeled, sold, or represented as organic. 7 C.F.R. § 205.100(a) ("The emphasis and basis of these standards is on process, not product."). The NOP is housed within the USDA Agricultural Marketing Service and regulates the certification, authentication, and labeling of organic foods. The NOP regulations define organic as a "labeling term," 7 C.F.R. § 205.2, and authorize the labeling of raw or processed agricultural products in three ways: "100 percent organic," "organic," or "made with organic (specific ingredients or food groups(s))." 7 C.F.R. § 205.301. The first label requires that the product contain 100 percent organically produced ingredients; the second requires that the product contain not less than 95 percent organically produced raw or processed agricultural products; and the third requires that the product contain at least 70 percent organically produced ingredients.

A producer intending to use any of these labels in the marketplace must comply with production standards that "maintain or improve the natural resources of the operation, including soil and water quality." 7 C.F.R. § 205.200. The regulations specify land requirements and standards for soil fertility, seeds, crop rotation, and pest management. 7 C.F.R. § 205.200–205.290. USDA-accredited certifying agents (ACAs) evaluate production standards, review organic plans (the three-year management history of the land), and perform on-site inspections to ensure compliance with the USDA organic regulations. 7 C.F.R. §§ 205.500–510, 205.660, 205.670.

The OFPA also established the NOSB, a federal advisory board made up of 15 volunteer representatives of the organic market, including individuals who own or operate organic farming or handling operations, retail establishments with significant business in organic products, experts in environmental protection and conservation, representatives of public and consumer interest groups, and an organic certifying agent. 7 U.S.C. § 6518(a)–(b). The NOSB assists in the development of standards for substances to be used in organic production and makes recommendations to the secretary on a wide range of issues involving the production, handling, and processing of organic products. 7 C.F.R. § 205.2. The NOSB holds public meetings twice a year to vote on proposals and to receive input from the organic community. Each NOSB member is appointed by the USDA secretary for a five-year term.

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What Is Hydroponics?

Hydroponic cultivation is often thought of as the cultivation of plants in water. In hydroponic cultivation, however, roots can receive nutrients through air or in other inert media as well as from water. Because plants can grow in a variety of media, hydroponics is more broadly thought of as the cultivation of plants without soil. The absence of soil from hydroponic production is at the heart of the organic movement's argument that hydroponics may not qualify as "organic."

Growing crops in soil requires space, labor, and water, as well as good weather conditions, and hydroponic advocates often highlight that these requirements are minimized in hydroponic cultivation. First, because hydroponic crops are typically grown vertically, in a closed stacked system, rather than out, the need for expansive amounts of land is eliminated. Additionally, hydroponic operations apply water and nutrients directly to the roots of each plant. Water is reused, and less is lost to evaporation and runoff. The hydroponic method allows plants to grow faster and closer together, reducing the demand for space and water. One report found that as compared to traditional agriculture, vertical farming uses 70 to 95 percent less water and over 90 percent less land. Renee Choe, *How Sustainable Is Vertical Farming? Students Try to Answer the Question*, State of the Planet, Earth Institute, Columbia University (Dec. 10, 2015), <http://blogs.ei.columbia.edu/2015/12/10/how-sustainable-is-vertical-farming-students-try-to-answer-the-question>. In addition, because hydroponics does not use soil, there is no chance of soil-borne insect pests, disease attack, or weed infestation.

Hydroponics is being pursued in places where space or climate makes conventional farming a challenge. For example, hydroponics has made rice production a possibility in crowded Tokyo, Japan, and berry, citrus fruit, and banana production possible in the dry, arid climate of Israel. Miriam Kresh, *Israeli Start-up Offers a Better Way to Grow Food*, Jerusalem Post (Feb. 24, 2017), available at www.jpost.com/Metro/Hope-for-a-hungry-planet-476268. In the United States, hydroponics is a growing component of urban agriculture efforts and is considered one way to combat food deserts—a place where it is difficult to find healthy, affordable fresh food. In 2017, Congresswoman Marcy Kaptur (D–OH) introduced the Urban Agriculture Production Act, which includes hydroponics in the definition of "urban agriculture." H.R. 3699, 15th Cong. (2017). The bill proposes the creation of a new position, Urban Agriculture Liaison, within the USDA, who will provide "technical assistance" to urban farmers using "unconventional farming practices," such as hydroponics. *Id.* at § 5(b)(4)(F).

Hydroponics is also often discussed when contemplating the impact of climate change on agriculture production. Farming has always been a risky business, subject to whims of Mother Nature, but weather patterns are becoming increasingly unpredictable with many areas experiencing prolonged water shortages, unexpected frosts, and increased precipitation. Climate change impacts and will continue to impact agricultural yields, causing leaders to think about alternative farming methods, including hydroponics. In addition, because hydroponic production can occur year-round, many hydroponic advocates argue that these operations have a higher yield and offer a more reliable way to meet the nutritional needs of the world's growing population.

Hydroponic operations, however, are not resource-free. Because crops can be grown year-round, hydroponic operations continuously use energy to maintain certain lighting and temperatures. Hydroponics also require a high initial investment and can be cost prohibitive to many farmers. Despite these limitations, the hydroponic market share is expected to have an annual growth rate of around 6.4 percent over the next decade to reach approximately \$13.73 billion by 2025.

Can Hydroponics Be Organic?

The growing popularity of hydroponics is a cause of concern for more traditional organic farmers who argue that crops grown without soil should not be able to use the USDA organic label. Although hydroponic operations are not mentioned in OFPA, the act that established the NOP, some hydroponic produce carries the USDA "organic certified" label.

Even though OFPA does not mention the word "hydroponics," the NOSB had confronted hydroponics before its November 2017 meeting. In 1995, before the USDA proposed the first rules implementing OFPA, the NOSB, in the context of greenhouse standards, made the following statement on hydroponics: "Hydroponic production in soilless media to be labeled organically produced shall be allowed if all provisions of the OFPA have been met." See National Organic Program, 62 Fed. Reg. 65,850 (Dec. 16, 1997). In 2002, the NOP redefined "organic production" in the Code of Federal Regulations as "a production system that . . . respond[s] to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biological diversity." 7 C.F.R. § 205.2. Because this definition did not require that organic production systems be soil-based, and hydroponics was not specifically addressed elsewhere in the regulations, the door was left open for certifying agents to certify hydroponic operations as organic.

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In 2010, the NOSB recommended engaging in the rule-making process to exclude hydroponics formally. The recommendation, entitled *Production Standards for Terrestrial Plants in Containers and Enclosures*, provided that "growing media shall contain sufficient organic matter capable of supporting natural and diverse soil ecology. For this reason, hydroponic and aeroponic systems are prohibited." *National Organic Standards Board, Proposals and Discussion Documents*, 67 (Oct. 2017). The NOP, however, never adopted this

recommendation and did not issue any guidance on hydroponics and their use of the organic label.

NOP inaction resulted in some agents certifying hydroponic operations as organic, while other certifying agents did not. The lack of consistency among certifying agencies and the lack of standards for hydroponic growing systems led to the NOSB's holistic review and the recommendation presented and voted on at the November 2017 meeting.

In advance of the November 2017 meeting, the Crops Subcommittee of the NOSB submitted its recommendation on Hydroponics and Container Growing in August 2017. NOSB, Proposals and Discussion Documents, 82–84 (October 2017). In its proposal, the subcommittee noted a divide on this issue. “[Some] think that organic certification should require plants be grown in soil that is connected to the earth’s surface. Others think that organic certification should allow the growing of plants in pure nutrient solution, without the presence of any soil or compost.” *Id.* at 63.

The subcommittee also summarized the comments it received from the public, including organic farmers. Those in favor of prohibiting hydroponics from being labeled organic “discussed the foundational principles of organic as originating with care and improvement of the soil and the overall ecosystem [including] longer-term improvements such as the use of nitrogen-fixing crops, cover crops for improved organic matter, and an overall regenerative system that protects water and wildlife as well as supporting biodiversity.” *Id.* at 75. In essence, hydroponics does not meet the letter or spirit of OFPA and its regulations.

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Siding with those in favor of prohibiting hydroponics, the subcommittee argued that hydroponics undermines the integrity of the USDA organic program. Both OFPA and the NOP regulations were written with the understanding that the foundation of organic farming is soil management. References to “soil fertility” exist in both the law and the regulations implementing the law, leading to the conclusion that soil is fundamental to organic agriculture. *Id.* at 74. While noting that hydroponic systems can be productive cropping systems appropriate for specific situations, the subcommittee ultimately concluded that such systems are not compatible with the principles of organic production and, as a result, they should be disqualified from organic certification. *Id.* at 74. The subcommittee proposed defining hydroponics in the regulations and requiring that to carry any one of the three organic labels, “the

product must be produced and handled without the use of . . . hydroponics.” *Id.* at 90.

In making its recommendation, the subcommittee noted that part of the NOSB's responsibility is to “recommend production practices that uphold the integrity of the USDA organic seal, that are built on the primacy of soil stewardship,” and “that are managed to emulate ecological processes of productive ecosystems.” *Id.* at 71. Despite the subcommittee's recommendation and the vocal nature of those opposed to allowing hydroponics to wear the organic label, the NOSB voted against excluding hydroponics from the USDA's organic program in November 2017.

The End of Organic?

The hydroponics vote is not the only event to have threatened the integrity of the organic program. The organic label has undergone increased criticism as claims of fraud and dilution are reported. Last year, shipments of soybean and corn from Turkey were imported and sold in the United States under the USDA organic label. A *Washington Post* investigation of the health certificates accompanying the shipments revealed that these imports did not comply with USDA organic standards, in part because certain pesticides were listed on the health certificates. Peter Whoriskey, *The Labels Said “Organic.” But These Massive Imports of Corn and Soybeans Weren’t*, *Washington Post*, May 12, 2017, at A10. A year earlier, the *Washington Post* discovered that Aurora Organic Dairy, a dairy that supplies organic milk to major retailers like Walmart and Costco, was housing over 90 percent of its cows indoors in violation of the organic regulations for dairy livestock. Peter Whoriskey, *Why Your “Organic” Milk May not Be Organic*, *Washington Post*, May 1, 2017, at A10. See also 7 C.F.R. § 205.239. The USDA closed its investigation of this facility in 2017 finding no violations of USDA organic standards, even though a chemical analysis of the milk revealed a composition more like conventional milk than other organic brands. See Peter Whoriskey, *USDA Closes Investigation into a Massive Organic Farm—But What Did It Check?* *Washington Post*, Sept. 28, 2017, at A11.

Hydroponics, like the corn and dairy examples, illustrate the increasing desirability of the organic label. Organic sales continue to climb and in 2017 reached close to \$49.4 billion, accounting for more than 5 percent of total food sales. Organic Market Analysis, Organic Trade Association, www.ota.com/resources/market-analysis (last visited June 20, 2018). As the popularity of organic food grows so does the number of businesses entering the organic market. Coca-Cola, Dole, General Mills, Heinz, Kellogg, Kraft, Tyson Foods, Walmart, and Kroger have all either acquired, partnered, or started their own organic lines. Kate L. Harrison, *Organic Plus: Regulating Beyond the Current Organic Standards*, 25 *Pace Envtl. L. Rev.* 211, 225 (2008).

But this growth is not without consequences. One scholar notes “a negative correlation between larger agribusinesses entering the organic market and the erosion of the organic standards.” Marne Cot, *Organic Agriculture Under the Trump Administration*, 13 *J. of Food Law & Policy*, 125 (2017). Another noted a growing distinction between “Big Organic” and organic as a kind of religion or social movement. A. Bryan Endres, *An Awkward Adolescence in the Organics Industry: Coming to Terms with Big Organics and Other Legal Challenges for the Industry’s Next Ten Years*, 12 *Drake J. Agric. L.* 17, 19 (2007).

The commercialization of organic not only impacts the integrity of the USDA organic program but also disadvantages smaller organic farmers. The so-called “Walmart effect” may squeeze out smaller, higher-cost producers from the organic marketplace. *Id.* at 26. Professor Endres has warned that the organic market may “bifurcate” with two distinct units: an industrial scale market with organics being produced for grocery stores and a “beyond organic” market that forgoes the organic certification process and focuses more on the social and local aspects of farming. *Id.* at 56–57.

The NOP’s integrity is put at further risk when the NOSB’s integrity is threatened. Some argue that the board is stacked, susceptible to the influence of Big Organic. As one longtime organic farmer put it, the board is made up of people who “[e]ither they don’t have a clue, or their interest in making money is more important than their interest in maintaining the integrity of organics.” Stephanie Strom, *Has “Organic” Been Oversized?* *New York Times*, July 8, 2012, at BU1. A former NOSB member who retired last summer observed “that industry has an outsized and growing influence on USDA—and on the NOSB (including through NOSB appointments)—compared to the influence of organic farmers, who started this organic farming movement.”

Although allowing hydroponics to carry the organic label is viewed as weakening the NOP, efforts are under way both to improve the OFPA and to reclaim the original goals of organic farming. One response is to strengthen existing legislation. Congressman John Faso (R–NY) introduced the Organic Farmer and Consumer Protection Act of 2017, to “crack-down” on fake organics and support organic farmers. This bill requests \$24 million over five years to the help carry out the activities of the OFPA. In addition, it calls for modernizing international trade tracking and data collection systems and for collaborative investigation and information sharing to reduce fraud. H.R. 3871, 15th Cong. 2017.

Another response has been the creation of new standards. One such proposal is the “regenerative organic” standard to fill in gaps in the current USDA organic rules. The regenerative organic standard was launched by the Rodale Institute to “increase soil organic matter over time, improve animal welfare, provide economic stability and fairness for farmers, ranchers, and workers, and create resilient regional ecosystems and communities.” The three pillars of this label are soil

health, social fairness, and animal welfare. Standards for these pillars are expected to be released in March 2018 with small pilot programs beginning shortly thereafter. The regenerative organic standard builds on the standards set forth by USDA Organic and similar programs internationally, particularly in the areas of animal welfare and farmer and worker fairness.

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A more recent proposal, that appears to be in direct response to the hydroponic vote, is the Real Organic Project, which proposes a new “Add-On” label to represent the organic farming. It will use USDA certification as a base, but it will have a small number of critical additional requirements to differential itself from hydroponics, for example.

While disappointed by the hydroponic vote, organic farmers appear more committed to organic practices than ever before. Rather than abandoning the USDA organic program completely, however, these farmers appear poised to build on it in an effort to reclaim control and maintain the authenticity of the organic program they worked so hard to create. Perhaps the hydroponic vote was not the end of organic, but the beginning of the next chapter of the organic movement. 🌱