



# BEYOND PESTICIDES

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National Organic Standards Board  
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## Re. LS and CS Aquaculture Materials

These comments are submitted on behalf of Beyond Pesticides. Beyond Pesticides, 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, 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 groups around the world.

Beyond Pesticides opposes the recommendation of any materials for use in aquaculture –for production of either aquatic plants or aquatic animals —until the NOP adopts final practice standards for aquaculture. Although there are no proposals for materials to be used in aquatic plant production on the docket now, we intend these comments to also inform the discussion of materials in the Crops Subcommittee.

### 1. Issues in common to plant and animal aquaculture

#### a. Inputs must be judged in the context of an aquaculture system.

A system that could be considered organic is described in this short video:  
<http://www.youtube.com/watch?v=4EUAMe2ixCI>.

In spite of the fact that aquaculture is taking place in a system without soil, we can still apply organic principles. The first of the “NOSB Principles of Organic Production and Handling” adopted October 17, 2001, is:

1.1 Organic agriculture is an ecological production management system that promotes and enhances biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. These goals are met, where possible, through the use of cultural, biological, and mechanical methods, as opposed to using synthetic materials to fulfill specific functions within the system.

In terrestrial organic agriculture, the focus is on building a healthy soil that provides nutrients for plants and animals. How do we review materials for aquatic aquaculture in a system where

there is no soil? Organic aquaculture, like other forms of organic agriculture, must rely on the underlying ecology to feed plants and animals, rather than outside inputs. Synthetic materials must not be used to fulfill system functions, but must be only non-routine inputs and should not serve to make up for an overcrowded or poorly designed system.

**b. Materials in aquaculture must be reviewed for their aquaculture use.**

Information gathered in support of other uses —Technical Reviews, for example— can be used to supplement, but not replace aquaculture-specific information. The use of the material is an essential factor —using CO<sub>2</sub> as synthetic fertilizer is different from using it to produce carbonated drinks.

**i. OFPA requires that National List substances be considered by specific use.**

§6517(b) states, “The list established under subsection (a) of this section shall contain an itemization, by specific use or application, of each synthetic substance permitted under subsection (c)(1) of this section or each natural substance prohibited under subsection (c)(2) of this section.” OFPA requires that the Secretary determine that “the use of such substances would not be harmful to human health or the environment...” and that “the specific exemption is developed using the procedures described in subsection (d) of this section.” Therefore, the NOSB must consider information relating to the aquaculture use and not depend on information relating to other uses of the material.

**ii. The aquatic environment transports materials in a form that is accessible to many organisms.**

Materials —both biological and chemical— in the aquatic environment are often dissolved or suspended in the water. This makes them easily transportable—in some cases globally by organisms that are very mobile—and means that the impacts of materials added to an aquaculture system must be considered very broadly. Similarly, the aquaculture system may receive synthetic or non-organic inputs that have travelled a long distance.

**iii. Containment of aquatic organisms can be difficult.**

The evaluation of the movement of materials offsite must include movement in organisms and their metabolic products. If fish are fed food containing bioaccumulative toxic materials, for example, then we must evaluate whether the fish may escape and cause the toxic materials to be further bioaccumulated in their predators.

**iv. Bioaccumulation of contaminants can result in plant and animal products that fail to meet expectations of organic consumers.**

In particular, the presence of bioaccumulative contaminants in non-organic (wild-harvested) ocean fish or other organisms used for feed would increase the concentration of those contaminants in the aquaculture-fed fish. However, even fish grown organically may contain bioaccumulative toxic contaminants due to fallout from the air. Raising carnivorous fish organically therefore raises significant problems in meeting consumer expectations.

**v. Impacts of removal, as well as addition, of materials to the aquatic ecosystem must be considered.**

When wild-harvested organisms are considered as food sources, the impacts of depletion of their populations should be considered. In addition, the addition of pens of fish and farms of bivalves to the ecosystem can have impacts on the local biology and chemistry of the water, and these are also materials considerations, as they include food that is not organic.

**2. Key distinctions need to be defined.**

The Board needs to distinguish among various systems when describing the appropriate uses of materials. Those systems need to be defined.

**i. Open vs. closed systems**

Although the aquaculture recommendations previously passed by the NOSB mention “open water organic systems” and “closed containment organic systems,” those terms are not defined. Completely open systems, such as net pens in the ocean, and completely closed systems, such as recirculating systems with no discharges are two extremes of a continuum. If the NOSB is to make recommendations regarding materials used in aquaculture, then terms defining the degree to which materials are shared with the external environment must be defined.

**ii. “Integrated Multitrophic Aquaculture”**

“Integrated multitrophic aquaculture” (IMTA) is often identified as a possible organic model. However, IMTA is not itself well-defined. If practiced in land-based systems, it may allow greatly reduced discharges from the system. If practiced intensively in the ocean, it may be that “aquaculture of fed organisms (finfish or shrimp) is combined with the culture of organisms that extract either dissolved inorganic nutrients (seaweeds) or particulate organic matter (shellfish) and, hence, the biological and chemical processes at work are balancing each other.”<sup>1</sup> On the other hand, it may be practiced extensively in a natural/restored/artificial ecosystem like that shown in the video cited above. IMTA is not automatically sustainable, organic, or less consumptive of resources. Further definition is needed if the term were to be applied in materials annotations.

**iii. “Recirculating Aquaculture Systems”**

The term “recirculating aquaculture system” (RAS) also applies to a wide variety of different systems and has also been proposed as a possible organic model. Like IMTA, the crucial element is using nutrients from animals to feed plants. Like IMTA, RAS is not automatically sustainable, organic, or less consumptive of resources. Further definition is needed if the term were to be applied in materials annotations.

**3. Synthetic inputs must not be routine.**

Synthetic inputs may be needed to respond to unusual conditions or fine tune the system, but in organic production, they cannot be routine. There must be in place regulations defining an organic aquaculture system that integrates plants, animals, and microorganisms. Evaluating the

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<sup>1</sup> Thierry Chopin, 2006. Integrated Multi-Trophic Aquaculture, Northern Aquaculture, March 2006. <http://www2.unb.ca/chopinlab/articles/files/Northern%20Aquaculture%20IMTA%20July%2006.pdf>

use of synthetic materials outside of defined practice norms that do not depend on synthetics is contrary to OFPA.

#### **4. Decisions concerning organic aquaculture cannot rely on NPDES permits to protect water.**

This should not need to be stated. If other laws were adequate to achieve the objectives of OFPA, we would not need OFPA.

A number of reports have criticized the level of protection afforded by EPA's regulation of aquaculture facilities<sup>2</sup>. A recent report (2012) by the Harvard Law School Emmett Environmental Law and Policy Clinic, Environmental Law Institute, and the Ocean Foundation, *Offshore Aquaculture Regulation under the Clean Water Act*<sup>3</sup>, offers the following facts:

- Because EPA has not issued water quality standards for ocean waters, ocean discharge criteria cannot be based on water quality, but must be technology-based.
- Concentrated aquatic animal production (CAAP) facility effluent limitation guidelines (ELG) do not include numeric limitations and apply only to large facilities.
- Ocean discharge criteria contain little specific guidance on implementation.

They offer the following recommendations:

- Reduce CAAP facility production limits or apply case-by-case discretion to ensure that all aquaculture facilities in federal ocean waters—and particularly those projects using novel or untested technologies—are subject to effective NPDES permitting.
- Revise the aquaculture ELGs to set numeric standards for facilities located in federal waters.
- Identify information needed for undue degradation determinations for offshore aquaculture facilities and develop guidelines for data generation and submission, as well as default monitoring requirements, for offshore aquaculture NPDES permits.

The state of Maine regulates salmon aquaculture facilities through a general permit<sup>4</sup>, which was issued in 2008 and weakened in 2011.<sup>5</sup> In order to be covered by a general permit, the facility must issue a notice of intent to operate under the permit, demonstrate a legal leasehold, and submit a fee. General permits are generally regarded as a weak form of permitting.<sup>6</sup>

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<sup>2</sup> In addition to the 2012 report cited below, these include: T.R. Head, III, 2003. *Fishy Business—Regulating Aquaculture Operations in the U.S.* <http://www.balch.com/files/Publication/47d3f292-e868-4f9b-9ae5-8a10032b43eb/Presentation/PublicationAttachment/a83c0a25-f681-4ad2-8aab-00aae4ba0086/Fishy%20Business%20-%20THead.pdf> and RJ Goldburg, MS Elliot, and RL Naylor, *Marine Aquaculture in the United States: Environmental Impacts and Policy Options*, Pew Oceans Commission, Arlington, VA. [http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Protecting\\_ocean\\_life/env\\_pew\\_oceans\\_aquaculture.pdf](http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Protecting_ocean_life/env_pew_oceans_aquaculture.pdf)

<sup>3</sup> <http://eli-ocean.org/fish/files/CWA-aquaculture.pdf>

<sup>4</sup> [http://www.maine.gov/dep/water/wd/atlantic\\_salmon\\_aquaculture/MEG130000\\_2008.pdf](http://www.maine.gov/dep/water/wd/atlantic_salmon_aquaculture/MEG130000_2008.pdf)

<sup>5</sup> [http://www.maine.gov/dep/water/wd/atlantic\\_salmon\\_aquaculture/MEG130000\\_2008\\_MOD2011.pdf](http://www.maine.gov/dep/water/wd/atlantic_salmon_aquaculture/MEG130000_2008_MOD2011.pdf)

<sup>6</sup> JM Gaba, 2007. Generally Illegal: NPDES General Permits under the Clean Water Act. *Harvard Law Review* 31: 409-473. [http://www.law.harvard.edu/students/orgs/elr/vol31\\_2/gaba.pdf](http://www.law.harvard.edu/students/orgs/elr/vol31_2/gaba.pdf)

## **5. The NOSB should use annotations to restrict the use of synthetic materials to those cases justifiable by OFPA.**

As stated above, OFPA requires that National List substances be considered by specific use. The petitioned substances must meet all three OFPA criteria –essentiality, absence of adverse effects on humans and the environment, and compatibility with a system of organic and sustainable agriculture. Ensuring that the listing meets all three criteria requires at the least a delineation of the use conditions under which the substance is essential.

## **6. Issues of concern to animal aquaculture**

### **a. The system makes a difference.**

Determining whether a material is appropriate for use in net pens involves different issues from the use in recirculating land-based systems. Salt water is different from fresh water. Integrated multitrophic systems are different from monocultures. These differences should be reflected in annotations.

### **b. The use of fish meal and fish oil and their implications for organic aquaculture should be revisited.**

**Feed for aquacultured fish should be included on the list of things the NOSB reviews as materials. Criteria for feed should include:**

- appropriateness to species - carnivorous species should be fed species similar to their natural food, raised organically.
- same prohibitions as for other livestock (no GE crops as fish feed)
- environmental impact of feed (wild fish especially)
- human health impact (bioaccumulation of POPs in fish based feed)
- biodiversity impact (ecosystem impacts of harvesting wild fish to use as feed)

The fact that some fish that might be raised in aquaculture are predators will require materials considerations in aquaculture for situations that do not have a strict counterpart in terrestrial agriculture. In terrestrial agriculture, we have not had to consider the presence of bioaccumulating toxic materials in nonsynthetic feed because our livestock animals are fed vegetarian feed. However, if wild-caught fish are used as a feed source for fish in aquaculture, then the “incidental” level of synthetic bioaccumulative toxic chemicals must be seen as a synthetic input.

### **c. Escapes are relevant to materials decisions.**

Materials decisions must take into account the movement of animals from the aquaculture facility because the animals carry with them residues of food and other inputs.

### **d. Petitioned materials should not be approved.**

Beyond Pesticides opposes the listing of synthetic vitamins, synthetic trace minerals, synthetic tocopherols, and chlorine materials for use in animal aquaculture. The materials that have been petitioned have not been considered within the context of the aquaculture system in which they may be used. They have been petitioned as routine inputs, and therefore their essentiality has not been considered within the context of an organic aquaculture system in which synthetic

inputs are not routine. The NOSB should consider whether annotations are needed to restrict the use to “closed” systems. Specific comments are below.

### **i. Vitamins**

Neither the petition nor the subcommittee’s proposal justifies the blanket approval of all synthetic vitamins. Are any vitamins available as nonsynthetics? It appears that the Livestock Subcommittee has not considered the impacts of possible enrichment of the aquatic environment due to feed falling through net pens or being released in discharges from other systems.

### **ii. Trace minerals**

Neither the petition nor the subcommittee’s proposal justifies the blanket approval of all synthetic trace minerals. Are any trace minerals available as nonsynthetics? It appears that the Livestock Subcommittee has not considered the impacts of possible enrichment of the aquatic environment due to feed falling through net pens or being released in discharges from other systems. Harmful algal blooms as a result of iron enrichment are well known.<sup>7</sup>

### **iii. Tocopherols**

Beyond Pesticides opposes the listing of synthetic tocopherols for animal aquaculture. Tocopherols are petitioned as a preservative (antioxidant) for fish meal. Synthetic preservatives are incompatible with organic production. Furthermore, organically produced livestock need organic feed, so fish meal should not be fed to fish unless it is produced organically.

### **iv. Chlorine**

The chlorine proposal is really two distinct proposals –disinfection of hard surfaces, which is similar to other uses of chlorine in organic livestock production, and disinfection of culture water, which is a distinct use that is not in any OFPA category in OFPA §6517 (c)(1)(B)(i). Nonchemical alternatives include steam sterilization for equipment, UV radiation and/or ozone for water disinfection.<sup>8</sup> Furthermore, the environmental community supports a move away from chlorine chemistry, so no additional uses of chlorine should be added to the National List. There are now resources associated with “Green Chemistry” programs, such as the one at the University of Massachusetts in Lowell, and the Design for the Environment program at EPA that address chemical alternatives to chlorine as a disinfectant when such nonchemical approaches as steam are not appropriate. These need to be considered in evaluating alternatives. See, for example, the following websites:

[The Presidential Green Chemistry Challenge Awards Program](#) p. 30 (p. 34 of pdf)  
[Overview of Design for the Environment](#), disinfectants p. 20  
[Green Product Certification and Labeling: Quick Reference](#).

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<sup>7</sup> See, for example, Heisler, J.; Glibert, P. M.; Burkholder, J. M.; Anderson, D. M.; Cochlan, W.; Dennison, W. C.; Dortch, Q.; Gobler, C. J.; Heil, C. A.; Humphries, E.; Lewitus, A.; Magnien, R.; Marshall, H. G.; Sellner, K.; Stockwell, D. A.; Stoecker, D. K.; and Suddleson, M., 2008. "Eutrophication and harmful algal blooms: A scientific consensus" *U.S. Environmental Protection Agency Papers*. Paper 169. <http://digitalcommons.unl.edu/usepapapers/169>

<sup>8</sup> See Crops TR for Chlorine, January 31, 2011, lines 611-628.

## 7. Of special concern to plant aquaculture

**NOP guidance puts the role of NOSB decisions in question.** The NOP Policy Memorandum of September 12, 2012 on Production and Certification of Aquatic Plants states,

This policy memorandum is issued as a reminder that aquatic plants and their products may be certified under the current USDA organic regulations. Certifiers and their clients may use the USDA organic regulations, including the National List of Allowed and Prohibited Substances at 7 Code of Federal Regulations (CFR) 205.601-205.602, as the basis for the production and certification of cultured and wild crop harvested aquatic plants.

This statement makes the purpose of petitioning materials for aquatic plant production very unclear. None of the materials on §205.601 has been approved and listed for use in aquaculture. For the NOP to approve such use would appear to be in conflict with OFPA §6517(d)(2), which prohibits the Secretary from allowing exemptions not recommended by the NOSB. It is also in conflict with §6517(b), which requires that exemptions be by specific use or application. (See 1.b. above.)

Furthermore, the new NOP sunset process will make it much more difficult to remove the aquaculture materials or annotate them in the future if the Board thinks it necessary. Because we believe the NOP process violates the statute, and will therefore not subject the aquaculture materials to the required assessment to determine re-listing at sunset in the future, we sincerely urge NOSB members to oppose these aquaculture materials petitions and any others where removal or annotation might conceivably be needed based on health, environmental, and essentiality issues until we reinstate the sunset process of OFPA and the Board.

Thank you for your consideration of these comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Terry Shistar".

Terry Shistar, Ph.D.  
Board of Directors