BEYOND PESTICIDES
701 E Street, SE ▪ Washington DC 20003
202-543-5450 phone ▪ 202-543-4791 fax
info@beyondpesticides.org ▪ www.beyondpesticides.org

March 20, 2021

Ms. Michelle Arsenault
National Organic Standards Board
USDA-AMS-NOP
1400 Independence Ave. SW.,
Room 2648-S, Mail Stop 0268
Washington, DC 20250-0268

Docket ID # AMS-NOP-20-0089

Re. CS: Ammonia Extract

These comments to the National Organic Standards Board (NOSB) on its Spring 2021 agenda are submitted on behalf of 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, 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.

Beyond Pesticides agrees with the petitioner that nonsynthetic ammonia extracts should be listed on §205.602 as prohibited nonsynthetic inputs. Ammonia extracts—synthetic or nonsynthetic—are harmful to soil organisms and inconsistent with organic production. While the use of synthetic ammonia extracts can be prevented by merely not listing them on §205.601, the use of nonsynthetic ammonia extracts can be prevented only by listing them on §205.602.

Use of ammonia extracts is incompatible with organic production.

In contrast to the reductionism of "conventional" chemical-intensive agriculture, the origins of organic agriculture are in holistic and ecological thinking. 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.[1] Together these three principles describe a production system that are in sync with natural systems.

[1] See Sir Albert Howard. The Soil and Health: The Study of Organic Agriculture (1940), and An Agricultural Testament (1947).

The Law of Return. In an organic system, residues are returned to the soil by tillage, composting, or mulching. 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.

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

Feed the soil, not the plant. The dictum "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.

Biodiversity. 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).

In the case of ammonia extracts, we are particularly interested in the principle of feeding the soil rather than the crop. OFPA §6513(b) requires that organic operations establish a plan designed to "foster soil fertility, primarily through the management of the organic content of the soil through proper tillage, crop rotation, and manuring."

Substances of high solubility, i.e., those materials that provide nutrients directly to the plant because they are quickly taken up into the plant from the soil solution, are counter to foundational organic principles, so they have always been restricted. Such materials are listed in §205.602—Nonsynthetic substances prohibited for use in Organic Crop Production or the "prohibited naturals" section of the National List:

1) Calcium chloride is limited to treating a physiological disorder;
2) Potassium chloride must be used in a manner that minimizes chloride accumulation in the soil; and
3) Sodium nitrate is restricted to no more than 20% of the crop's total nitrogen requirement. (The NOSB has voted to removed the annotation, making this an absolute prohibition, but NOP has not, as yet, implemented this recommendation.)

The organic regulations limit substances of high solubility.

In the preamble to the publication of the NOP Final Rule on December 21, 2000, NOP discusses how it decided to agree with the NOSB recommendation and to put specific regulation of substances of high solubility into the annotations for each of these materials where they appear on the National List of Allowed and Prohibited Substances. NOP goes on to say, "Based on the recommendation of the NOSB, the final rule would prohibit use of these materials [substances of high solubility], unless the NOSB developed recommendations on conditions for their use and the Secretary added them to the National List."

At the time, the discussion addressed mined substances of high solubility because there were no concentrated, highly soluble plant nutrient materials other than mined sources available at that time. New materials of high solubility should be prohibited or restricted. These highly soluble materials, most of which are nonsynthetic, do not appear on the National List and are used in soil-based production, as well as in some hydroponic and container systems. Highly soluble sources of plant nutrients should be prohibited or restricted through listing on §205.602 so as to not allow organic production practices that stray from the foundational principle of organic production to "feed the soil, not the plant."

Use of ammonia extracts is not necessary for organic production.

As discussed above, the principle of "feed the soil, not the plant" is foundational to organic production. Consequently, organic practices have grown up without the use of highly soluble nutrients. Klaas and Mary-Howell Martens, writing for the Rodale Institute, provide this list of sources of nitrogen available to the organic grower: manure, compost, compost tea, alfalfa meal or pellets, leaf and plant waste compost, soybean meal, seaweed, blood meal, feather meal, and fish by-products.[2]

Use of ammonia extracts is harmful to the environment, including soil organisms.

Ammonia is toxic, both to humans[3] and to soil organisms.[4] Applications of ammonia decimate soil fungi and nematodes.[5] Similarly, nitrogen fallout into forests is implicated in reduction of habitat suitability for native forest vegetation.[6] Highly soluble nutrients such as ammonia extracts move in runoff or eroded soil to surface water, where even extremely low concentrations harm aquatic life.[7] Ammonia gas released from agriculture is a contributor to

---

[2] Klaas and Mary-Howell Martens, 2004. "20 Ways to Boost Soil Fertility." https://rodaleinstitute.org/blog/20-ways-to-boost-soil-fertility/.

[3] https://pubchem.ncbi.nlm.nih.gov/compound/Ammonia#section=Toxicity.

[4] https://certifiedcropadviser.org/files/certifications/certified/education/self-study/exam-pdfs/157.pdf.

[5] Eno, C.F., Blue, W.G. and Good Jr, J.M., 1955. The effect of anhydrous ammonia on nematodes, fungi, bacteria, and nitrification in some Florida soils. *Soil Science Society of America Journal*, *19*(1), pp.55-58.

[6] McDonnell, T.C., Belyazid, S., Sullivan, T.J., Bell, M., Clark, C., Blett, T., Evans, T., Cass, W., Hyduke, A. and Sverdrup, H., 2018. Vegetation dynamics associated with changes in atmospheric nitrogen deposition and climate in hardwood forests of Shenandoah and Great Smoky Mountains National Parks, USA. *Environmental Pollution*, *237*, pp.662-674.

[7] https://www.mda.state.mn.us/ecological-effects-ammonia.

biodiversity loss.[8] Ammonia gas is often found in the form of aerosols of small particles (PM 2.5).[9] PM 2.5 is considered a major environmental threat to human health because, when inhaled, it may reach the peripheral regions of the bronchioles and interfere with gas exchange inside the lungs, where it contributes to cancer and respiratory and cardiovascular disease.[10]

Reactive nitrogen gases are a contributor to climate change.

Reactive nitrogen released by agriculture is a contributor to climate change. Nitrous oxide (N_2O) is considered to be a potent greenhouse gas (GHG), with approximately 300 times the warming potential of carbon dioxide.[11] Through their presence as hazardous aerosols, ammonia and nitrogen oxides (NO_X) may contribute a small cooling effect, but it is not wise to engage in climatological engineering with hazardous air pollutants. The reduction of GHGs compared to industrial fertilizers is a positive aspect of organic farming.[12]

The allowance of ammonia extracts and other highly soluble fertilizers contradicts and violates "organic" principles and law.

Hydroponics, for example, would be impossible without the use of highly soluble fertilizers. Allowing potentially unlimited use of soluble nitrogen fertilizer would give an advantage to producers who substitute these inputs for the practices that define organic production.

Conclusion

We urge you to approve this petition to prohibit the use of ammonia extracts in organic production.

Thank you for your consideration of these comments.

Sincerely,

Terry Shistar, Ph.D.
Board of Directors

---

[8] Guthrie, Susan, Sarah Giles, Fay Dunkerley, Hadeel Tabaqchali, Amelia Harshfield, Becky Ioppolo, and Catriona Manville, Impact of ammonia emissions from agriculture on biodiversity: An evidence synthesis. The Royal Society, 2018. https://www.rand.org/pubs/research_reports/RR2695.html.

[9] Erisman, J.W. and Schaap, M., 2004. The need for ammonia abatement with respect to secondary PM reductions in Europe. *Environmental Pollution*, *129*(1), pp.159-163.

[10] WHO (World Health Organization). 2005. Air quality and health. http://www.who.int/mediacentre/factsheets/fs313/en/index.html.

[11] https://insideclimatenews.org/news/11092019/nitrous-oxide-climate-pollutant-explainer-greenhouse-gas-agriculture-livestock/.

[12] Shade, J., Cattell Noll, L., Seufert, V., Galloway, J.N. and Erisman, J.W., Decreasing reactive nitrogen losses in organic agricultural systems. *Organic Agriculture*, pp.1-7.