



BEYOND PESTICIDES

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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-18-0071-0001

Re. CS: Ammonium citrate and ammonium glycinate

These comments to the National Organic Standards Board (NOSB) on its Spring 2019 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.

The petitioner has asked that two chelating agents be added to the National List – ammonium citrate and ammonium glycinate. The petitioner states that neither material would be used in organic production, but would be used in producing chelated minerals that would be used in crop production.

The wrong substances are petitioned.

The law and science suggest that the petitions are requesting allowance of the wrong substances and that board consideration of the petitions as submitted would fail to address OFPA criteria appropriately—perhaps leading to overemphasis of some hazards and neglect of others, as well as a neglect of the appropriate discussion of the necessity for the chelated minerals. If the materials are listed as petitioned, it will lead to unforeseen use associated with significant hazards.

The petitioner should be trying to modify:

§205.601(j)(6) Micronutrients—not to be used as a defoliant, herbicide, or desiccant. Those made from nitrates or chlorides are not allowed. Soil deficiency must be documented by testing.

- (i) Soluble boron products.
- (ii) Sulfates, carbonates, oxides, or silicates of zinc, copper, iron, manganese, molybdenum, selenium, and cobalt.

To read:

(6) Micronutrients—not to be used as a defoliant, herbicide, or desiccant. Those made from nitrates or chlorides are not allowed. Soil deficiency must be documented by testing.

(i) Soluble boron products.

(ii) Sulfates, carbonates, oxides, ~~or~~ silicates, **citrates, or glycinate**s of zinc, copper, iron, manganese, molybdenum, selenium, and cobalt.

“Inert Ingredients”?

The technical reviews suggest that ammonium glycinate and ammonium citrate may be considered eligible for listing on the National List because they are “inert ingredients.” There are two problems with this approach. First, the products in which the substances are used are not pesticides. Second, EPA does not recognize ammonium glycinate as an “inert” ingredient, and only ammonium citrate dibasic is listed as an “inert” in EPA’s database.¹ Dibasic ammonium citrate is approved as an “inert” for nonfood use only.²

Environmental and Health Impacts

Manufacturing Process

The Organic Foods Production Act (OFPA) requires the impacts of the manufacturing process to be evaluated as part of the consideration of a petition.

The manufacture of glycine uses formaldehyde and the highly toxic hydrogen cyanide as ingredients. Ammonia is an ingredient as well as ammonium ion a byproduct of the manufacture of ammonium glycinate.³ The manufacture of ammonium citrate also involves the toxic chemical ammonia as an input and ammonium ion as a byproduct.⁴

Impacts of Ammonium Glycinate and Ammonium Citrate Applied to the Field

There is also a listing for a chelating agent on the National List:

§205.601(j) As plant or soil amendments.

(4) Lignin sulfonate—chelating agent, dust suppressant.

In addition, humic acids are also used as “chelating agents:”

§205.601(j) As plant or soil amendments.

(3) Humic acids—naturally occurring deposits, water and alkali extracts only.

¹ <https://iaspub.epa.gov/apex/pesticides/f?p=INERTFINDER:1::NO:1::>

² https://iaspub.epa.gov/apex/pesticides/f?p=INERTFINDER:3::NO::P3_ID:8015.

³ Ammonium glycinate TR, 2018. Lines 359-385.

⁴ Ammonium citrate TR, 2018. Lines 359-385.

The use of these materials involves the addition of lignin sulfonate or humic acid to the soil. Our understanding is that the application of ammonium glycinate or ammonium citrate to the soil could have effects that are not anticipated by this petition.

Micronutrient Glycinates and Citrates

Because the petitions address ammonium citrate and ammonium glycinate and not the chelates that would actually be added to the crop, the technical reviews frequently repeat the phrase “when used as petitioned.” As stated above, the most straightforward way to address this—and ensure that ammonium citrate and ammonium glycinate are not used in unintended and unexpected ways—is to view the petition as a proposed amendment to §205.601(j)(6). Nevertheless, it appears that after delivery of the micronutrient cations, ammonium glycinate and ammonium citrate may be present in the soil. Impacts of those chemicals, as well as the ammonia that accompanies the micronutrient chelates, should be evaluated.

According to the technical review (TR) of ammonium glycinate, “Once the water-soluble micronutrient has been absorbed by plant life, the glycinate anion and ammonium salt (product of Equation 2) remain in the soil.”⁵ Similarly, in the case of ammonium citrate, “a solution of the chelated micronutrient and inorganic ammonium salt will be employed.”⁶ Ammonia is a synthetic fertilizer that should not be allowed in organic production. It is also toxic to soil organisms—its properties as a soil fungicide have been recognized at least since 1970.⁷

Furthermore, “once the chelated micronutrient has been absorbed by plants, the glycinate chelating agent may remain in the soil. Since the remaining glycinate is a chelating agent, there are several cations (Ca²⁺, Cu²⁺, Mg²⁺) that may be impacted.”⁸ The petition describes the bond of the chelating agent with the metal as “tight.” An example of a glycinate that forms a tight bond with micronutrient metals is the herbicide glyphosate. It is an effective herbicide because it blocks the availability of micronutrient metals to plants. Thus, another issue that should be addressed in considering the substances actually added to crop fields is whether the bonds with the metals are so strong that they make the chelate ineffective as a micronutrient source and whether the remaining glycinate in the soil blocks the availability of other micronutrients in the soil. Although the TR deals with the possible beneficial impacts of chelation of toxic heavy metal ions, it does not address the possible negative impacts of chelating micronutrients in the soil. Similarly, the ammonium citrate TR mentions that citrate anions remaining after uptake of the associated micronutrients could react with calcium, copper, and magnesium.⁹

⁵ Ammonium glycinate TR, 2018. Lines 439-440.

⁶ Ammonium citrate TR, 2018. Lines 431-432.

⁷ Smiley, R.W., Cook, R.J. and Papendick, R.I., 1970. Anhydrous ammonia as a soil fungicide against *Fusarium* and fungicidal activity in the ammonia retention zone. *Phytopathology*, 60(8), pp.1227-1232. Bünemann, E.K., Schwenke, G.D. and Van Zwieten, L., 2006. Impact of agricultural inputs on soil organisms—a review. *Soil Research*, 44(4), pp.379-406.

⁸ Ammonium glycinate TR, 2018. Lines 483-485.

⁹ Ammonium citrate TR, 2018. Lines 526-532.

Ammonium Glycinate and Ammonium Citrate are Not Essential for Organic Production, but...

There is “a range of natural chelating agents that are excreted by plants and microorganisms, or are produced from the decomposition of organic matter, and aid in the delivery of micronutrients in the soil.”¹⁰ §205.601(j)(6) also provides for use of soluble boron products and sulfates, carbonates, oxides, or silicates of zinc, copper, iron, manganese, molybdenum, selenium, and cobalt.

In addition, according to the technical reviews, An alternative to the application of micronutrient chelates is the application of organic matter in the form of manure or compost. These sources of organic matter include micronutrients, natural chelates, such as organic and amino acids, and microbes that produce natural chelating agents (Adeleke et al. 2017, Chen et al. 1998, Sorrenti et al. 2012). Sorrenti et al. have reported that compost-based treatments have been shown to enhance yield and quality of pears in calcareous soil, although these results were less successful than the application of iron-chelates (Sorrenti et al. 2012).¹¹

The application of organic matter is the means most compatible with organic principles. NOP regulations allow the application of synthetic micronutrients to correct soil deficiency. If synthetic micronutrients are to be continued to be allowed, it makes sense to allow their use in a form that is accessible to growers with alkaline soil. That could be accomplished through a revision of §205.601(j)(6) as suggested above, but the NOSB must examine possible impacts of the chelating agents and ammonia on the soil.

Conclusion

Beyond Pesticides opposes the listing of ammonium glycinate and ammonium citrate because the listing is incompatible with OFPA. However, it may make sense to consider a petition to amend §205.601(j)(6) to allow micronutrients as citrates or glycinate. Such consideration should examine possible effects of the chelating agents and ammonia on the soil.

Thank you for your consideration of these comments.

Sincerely,



Terry Shistar, Ph.D.
Board of Directors

¹⁰ Ammonium glycinate TR, 2018. Lines 599-600.

¹¹ Ammonium glycinate TR, 2018. Lines 649-654.