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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-21-0038

Re. CS: Carbon dioxide

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

The petition calls for use of CO_2 as an acidifying agent in irrigation water in which the pH is high. Submitted documents concern use of CO_2 as a plant growth enhancer. Except for the Tansley review, they refer to aerial use of CO_2, not dissolved CO_2. The Tansley review discusses CO_2 effects on pH in terms of mobilizing soil nutrients, not neutralizing or lowering pH of irrigation water that is too alkaline. The petition makes it clear that there are other potential uses of CO_2, including a plant growth enhancer, which is not appropriate for a synthetic material.

The petition does not establish a need for carbon dioxide as a pH adjuster.

The CS identifies sulfur burners and citric acid as alternatives. Another alternative is abandoning the dependence on irrigation. While most of these issues have been discussed by the NOSB, the crucial question with respect to compatibility with organic practices is whether sulfurous acid is used to enable the continued use of unsustainable agricultural practices. The build-up of alkaline salts results from unsustainable agricultural practices. As stated by Richard Cowen of UC Davis,

Therefore, irrigation can only be maintained on a long-term basis in the following conditions. Water is applied in such a way that salt is not allowed to build up in the soil. Usually, this means that a lot of good-quality water is applied, and that drainage is rapid and efficient. Soils need a large infusion of fertilizer, to balance the flushing that is required to keep them salt-free.

A region that can be irrigated on a long-term basis thus has

- An abundant supply of good water.
- Well-drained soil.
- Good regional drainage.
- A supply of fertilizer for the soil.

If any of these conditions fails, the system will eventually fail. Such failures have brought down civilizations that solved the engineering and logistic problems of designing, building, and maintaining irrigation systems, but neglected the long-term effects of salinization or nutrient depletion. Long-term problems of irrigation may not appear for a long time: today, for example, the valleys and basins of the San Joaquin, Rio Grande, Indus, Nile, Murray-Darling, Jordan, and Tigris-Euphrates are being irrigated, with progressive and visible increases in salinization and water-logging, and no remedy in sight. Only a few civilizations based on irrigating dry country have lasted for any length of time: sensible civilizations should not try to grow wetland crops in arid climates.

The major success stories for civilizations based on agricultural irrigation are Egypt and China. The major stories of failure are happening right in front of us. In present-day California, a giant industry is trying to maintain an irrigation economy with a diminishing supply of poor-quality water, on clay soils with very poor natural drainage, in an almost landlocked plain with poor or non-existent regional drainage, applying water that has been stripped of its natural load of silt.[1]

Therefore, the NOSB needs to ask whether the "need" for carbon dioxide reflects unsustainable farming practices.

If the NOSB approves this petition, it must do so with an annotation strictly limiting its use to pH adjustment.

The NOP has allowed hydroponic and container production to be certified organic if they do not use prohibited materials. Enhancing the growing environment with CO_2 can increase the productivity of hydroponic and container systems, especially in greenhouses.[2]

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[1] Richard Cowen, "Ancient Irrigation," Chapter 17 of *Essays on Geology, History, and People*. http://mygeologypage.ucdavis.edu/cowen/~GEL115/115CH17oldirrigation.html Accessed 12/29/2012.

[2] See, for example, Ryu, H.R., Choi, E.Y. and Choi, K.Y., 2018. Growth Characteristics, Yield and Fruit Soluble Carbohydrate Content of Hydroponically Grown Strawberry with Carbon Dioxide Fertilization.

While use of CO_2 to adjust the pH of irrigation water may have few adverse effects—outside of encouraging the unsustainable use of irrigation—the NOSB must ensure that it is not taking actions that will encourage soilless forms of "organic" production. Thus, such a listing for CO_2 must state, "For use only in pH adjustment; may not be used to enhance production in hydroponic, container, or other systems."

Environmental impacts have not been determined.

The CS says, "Carbon dioxide is a greenhouse gas and can contribute to climate change. Its increase in the atmosphere has altered the biodiversity in many ecosystems. However, the use of this product in accordance with the petition will not add to the increase of carbon dioxide. The petitioned use is for carbon dioxide produced as a byproduct of other processes. The carbon dioxide would be released to the atmosphere regardless of the petitioned use." **There is nothing in the petition that requires the use of CO_2 produced as a byproduct of other processes. If this is the intention of the CS, then it needs to be in an annotation.**

It should be noted that when this issue has been discussed during previous cycles, the point has been made that organic production should not rely on the byproducts of polluting industries. To do so is to accept polluting practices that organic has sought to end by accessing the impacts of allowed substances from cradle-to-grave—from production, use, to disposal. Clearly, stated in the history of organic law and policy is the intent that organic systems "enhance" environmental protection and the complex biological communities that sustains life. To, in effect, incorporate a reliance on polluting practices runs contrary to the critical role that organic is playing and must play in incentivizing alternative non-polluting practices.

Carbon dioxide as petitioned is not compatible with organic practices.

Carbon dioxide is not in any category of §6517(c)(1)(B)(i).

CO_2 is not a production aid. We have requested that the NOSB develop a definition of "production aid," which is defined in OFPA only by example. The examples given are "netting, tree wraps and seals, insect traps, sticky barriers, row covers, and equipment cleansers," and **CO_2 as an acidifying agent is not comparable to these materials. Therefore, it is not eligible for listing.**

The CS reasoning is erroneous.

The CS says, "Because carbon dioxide is approved as an organic processing substance, is already being produced, and its listing at §205.601 would be considered a recycling process, the Crops Subcommittee finds it compatible with a system of sustainable agriculture." First, National List materials must be listed for a specific use, and the fact that it meets the criteria for listing in processing food does not make it compatible with organic crop production. Second, as mentioned above, there is nothing in the petition or proposal that would require the use of recycled CO_2. Furthermore, the fact that the listing would allow the use of CO_2 as a plant growth enhancer in hydroponic and container production is incompatible with organic principles as previously expressed by the NOSB.

Conclusion

While CO_2 may be the best alternative for pH adjustment of irrigation water, documentation submitted by the petitioner and the CS proposal are inadequate to ensure that the listing would be used only to meet a need of organic producers, would not contribute to climate change, and would be compatible with organic production. Therefore, the petition should be rejected.

Thank you for your consideration of these comments.

Sincerely,

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