



BEYOND PESTICIDES

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National Organic Standards Board
Fall 2013 Meeting
Louisville, KY

Re. CS: Sunset of Aqueous Potassium Silicate

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 urges the Crops Subcommittee (CS) to oppose the relisting of aqueous potassium silicate for both the insecticide and the plant disease control uses. It has been found by the NOSB not to meet the OFPA criteria of essentiality and compatibility with organic production. There are potential adverse impacts that have not been evaluated by the NOSB. Furthermore, under the new sunset process directed by the NOP, unless the CS proposes not to relist aqueous potassium silicate, it may not come before the full board for a vote on future use, as required by the sunset policy of the *Organic Foods Production Act* (OFPA) and, historically, the Board.

The checklist from the 2007 decision checks “no” for the questions asking whether the essentiality and compatibility criteria are met, separately for each use. The CS should investigate organic management systems that conserve and build available silicon in the soil as alternatives to potassium silicate, addressing nonsynthetic materials and practices that would avoid the need for potassium silicate that involve soil management as well as foliar treatments.

Pesticides may cause adverse effects not only through direct toxic action, but also through changes induced in plants. According to the CS, “Potassium silicate makes plants more resistant to disease and herbivory, at least in part by concentrating silica. Humans and livestock are among the herbivores who might be consuming the treated plants.” High levels of silica in plants decreases digestibility and may contribute to kidney stones.¹ The revised petition (2006)

¹ Mayland, H.E. and Shewmaker, G.E. (2001) Animal health problems caused by silicon and other mineral imbalances, *Journal of Range Management*, 54, pp. 441-446. <http://eprints.nwisrl.ars.usda.gov/125/1/1047.pdf>

states that soluble silicate provides higher concentrations of silica in plants than are produced by natural sources. We believe that there is an adverse health effect if people cannot receive the nutrition they expect from a crop. The CS should therefore investigate the question of whether the foliar application of potassium silicate might have impacts on the nutritive value of treated foods that would exceed the impacts of silica obtained by the plant from natural soils.

According to the Agricultural Market Service's (AMS) September 16, 2013 *Federal Register* notice, this NOSB meeting may be the last chance for public input on substantive matters affecting board and public consideration of sunset recommendations that will be voted on at a subsequent (presumably the next) NOSB meeting. Since AMS has cited new substantive information brought to a sunset voting meeting as "untimely," it is critical that technical reviews (TRs) and checklists are published to facilitate public comment at the meeting prior to a voting meeting. In the case of APS, a new TR has been published, but a checklist has not.

New information has been provided in the new TR. That information supports the conclusions below. (Citations are to line numbers in TR.)

1. Dermal exposure can lead to low to medium systemic toxicity and skin irritation (577-579);
2. Silicon reduces the availability of elements such as manganese, iron, and aluminum to roots (471-473);
3. Treatment with potassium silicate may not be appropriate when crops are used for feeding or as forage for livestock because it makes some forages less digestible (540-543);
4. The addition of potassium silicate as a foliar nutrient may result in the production of less tender fruits and vegetables or forage for grazing animals (477-481);
5. Silica supplementation can result in elongation and thickening of stems, delayed antithesis and flower deformation in some species (487-490);
6. In addition to morphological changes, changes in micronutrient in plants may occur as a result of silica supplementation (490-492);
7. New alternative materials suggested include other forms of silica that are available as approved supplements for the soil that can provide the same protection over a longer term against plant disease and compost made with silica-rich plants (598-605, 676-678);
8. The TR suggests the following alternative practices: soilscaping, choice of variety and planting time, balancing silica accumulators and nonaccumulators, moisture management, choice of mulch and ground cover, and scouting (661-689); and
9. Internationally (Japan, Canada, EEC, CODEX, or IFOAM), natural sources of silica, not APS, are allowed (258-296).

As noted by the CS, there is still uncertainty on two major issues:

1. Potassium silicate makes plants more resistant to disease and herbivory, at least in part by concentrating silica. Humans and livestock are herbivores who might be consuming the treated plants. Does the foliar application of potassium silicate in the quantity and frequency needed for insect and disease control have impacts on the nutritive value of treated foods that would exceed the impacts of silica obtained by

the plant from natural soils? Are users employing mitigation strategies in consideration of these impacts? How should the NOSB weigh this impact on the nutritive value of treated plants?

2. Can organic management systems conserve and build available silicon in the soil in a ways that can be alternatives to potassium silicate? The 2014 TR suggests the following alternative practices: soilscaping, choice of variety and planting time, balancing silica accumulators and non-accumulators, moisture management, choice of mulch and ground cover, and scouting (661-689). Other forms of silica are also suggested as alternative materials (592-605). The subcommittee is interested in comments concerning nonsynthetic materials and practices being used in the field that would build comparable resistance to insects and fungi, while precluding the need for synthetic potassium silicate.

Finally, the NOP announcement concerning sunset allows for only one kind of recommendation to come out of the subcommittee –a recommendation against relisting the sunset substance. Even if the subcommittee believes that aqueous potassium silicate should be relisted, it does not have the authority to act on behalf of the full board. Therefore, the CS must propose that aqueous potassium silicate not be relisted.

Thank you for your consideration of these comments.

Sincerely,



Terry Shistar, Ph.D.
Board of Directors