Sunset 2015 Review
Meeting 2 - October, 2014
Crops Subcommittee
Sulfurous Acid

August 20, 2014

As part of the National List Sunset Review process, the NOSB Crops Subcommittee has evaluated the need for the continued allowance for or prohibition of the following substances for use in organic crop production.

Sulfurous Acid *Synthetic*

Use - As plant or soil amendment.

Listing: Sulfurous acid (CAS # 7782-99-2) - for on-farm generation of substance utilizing 99% purity elemental sulfur per paragraph (j)(2) of this section.

Technical Reports: 2010 TAP; 2014 TR

Original Petition: Sulfurous Acid (2008)

Past NOSB Actions: Recommended for addition to the National List on 5/2009

Regulatory Background: Proposed rule (including justification) published 1/12/2010 (75 FR 1555). Added to National List 7/6/2010 (75 FR 38693).

Sunset Date: 7/7/2015
Reference 7 CFR 205.601(j)(9)

Subcommittee Review

The Crops Subcommittee believes that the full Board should have the opportunity to complete the review of each sunset material by voting. The NOP has stated that to do this a motion to remove should be brought from the Subcommittee for each substance. If the Subcommittee motion to remove fails to receive a majority, the motion will still be put forward to the full board for review. The motion to remove is voted by the full Board and needs to receive a 2/3 majority to recommend removal.

Summary:

Sulfurous acid was added to the National List in 2009, with the annotation, "on-farm generation of substance utilizing 99% purity elemental sulfur per paragraph (j)(2) of this section." The Crops Subcommittee has received a Technical Review that contains new information that needs to be considered in the Sunset review:

1. The TR contains information about environmental impacts of sulfurous acid, particularly on soil organisms;
2. There is information on alternative materials and practices that was not considered by the board in 2009;
3. It appears that sulfurous acid might be used to correct the impacts of unsustainable irrigation practices;
4. This use of sulfurous acid is not permitted in organic agriculture in other countries

The Crops Subcommittee posed the following questions in the Spring 2014 meeting announcement:

1. The Crops Subcommittee is interested in the conditions under which sulfurous acid undergoes the transformation to sulfate, and conditions under which that sulfate is available as a plant nutrient. The 2014 TR describes the chemistry of sulfurous acid in the soil at lines 64-67, 140-149, and 261-264. The subcommittee seeks comments that address the following questions: Are there specific soil and ecological (e.g., moisture) conditions under which the transformation to sulfate would be made and the sulfate made available? On the other hand, are there soil and ecological conditions that would result in the build-up of hydrogen sulfite, sulfate, or other products of sulfurous

acid? Are there management practices that can be used by the grower to affect whether the transformation occurs and the sulfate is available to crops? Are there evaluation tools that can be used by farmers and certifiers to determine which of the above soil conditions are present?

2. The subcommittee would like public input on whether sulfurous acid is used to remedy conditions resulting from unsustainable agricultural practices. If so, how can this be evaluated by the NOSB in the sunset review of this material?

The Crops Subcommittee received 8 comments in favor of relisting sulfurous acid and 5 comments opposing relisting. Comments in favor of relisting included the following:

1. Sulfurous acid is tool organic growers can use to counteract soil salinity and alkalinity.
2. Sulfurous acid does not act as a sulfate fertilizer because the sulfate is present only at a parts per million level while sulfur is a secondary level nutrient (along with calcium and magnesium) that is needed at much higher quantities to influence plant growth.
3. Sulfurous acid is a water treatment for poor quality irrigation waters; it is not a remedy for unsustainable farming practices.
4. The soil and ecological conditions resulting in the build-up of hydrogen sulfite, sulfate, or other products of sulfurous acid would only happen in anaerobic soils with complete water saturation. This is unlikely to happen in the western portion of the United States because farmers here are very familiar with the conditions under which irrigation is needed.
5. It increases the sustainability of agricultural soils in alkaline environments as its use keeps soil pore space open to the air and water helping to leach away toxic salts.
6. Many small berry growers –especially blueberry growers—depend on this technology.

Comments opposing relisting included the following:

1. Specific uses must be delineated as well as conditions under which it can be used.
2. International standards do not allow sulfurous acid in crop production.
3. There are potential adverse impacts that have not been evaluated by the NOSB.
4. The NOSB needs to ask whether the "need" for sulfurous acid reflects unsustainable farming practices.

Conclusion

In reviewing the 2014 Technical Review and materials submitted by commenters, the Crops Subcommittee finds new evidence relating to OFPA criteria. There are concerns about compatibility with organic and sustainable systems, and also evidence of overall value to organic agriculture especially when saline/alkaline irrigation water quality problems exist. For more information, see the attached evaluation checklist. The subcommittee supports research to gather additional information needed to address the issues in the checklist.

Motion to Remove:

This proposal to remove will be considered by the NOSB at its public meeting.

Based on the Subcommittee's review, the Subcommittee proposes removal of this substance from the National List based on the following criteria in the Organic Foods Production Act (OFPA): **[OFPA criteria at 7 U.S.C. 6158(m),** (7) its compatibility with a system of sustainable agriculture.

Motion to remove Sulfurous Acid from the National List

Motion by: John Foster

Seconded by: Harold Austin

Yes: 4 No: 3 Abstain: 0 Recuse: 0 Absent: 0

Minority Statement on Motion to Remove

While the minority of the CS agrees with the majority that the full NOSB should vote on sunset materials, in voting against this motion it is following what we believe are required procedure of AMS/USDA as established by the September 16, 2013 Federal Register notice (78 FR 56811), which states that motions to remove be justified by criteria established by the Organic Foods Production Act. Because of concern that a change in NOSB procedures should be disclosed to the public before taking effect, the minority does not accept the compatibility criteria from 7 U.S.C. 6158(m)(7) that was provided in this case. Furthermore, AMS/NOP has said that no action by the NOSB maintains a sunset material on the National List.

Evaluation Criteria (checklist for criteria in each category)

	Criteria Satisfied?		
1. Impact on Humans and Environment	☒ Yes	☐ No	☐ N/A
2. Essential & Availability Criteria	☐ Yes	☒ No	☐ N/A
3. Compatibility & Consistency	☐ Yes	☒ No	☐ N/A

Substance Fails Criteria Category: 2, 3

NOSB Evaluation Criteria for Substances Added To the National List (Optional Checklist)

Category 1. Adverse impacts on humans or the environment? Sulfurous Acid

Question	Yes	No	N/A	Comments/Documentation (TAP; petition; regulatory agency; other)
1. Is there a probability of environmental contamination during use or misuse? [§6518(m)(3)]	X			There is a potential for damage to the local ecosystems from improperly maintained sulfurous acid generators. TR lines 330-331.
2. Is there a probability of environmental contamination during, manufacture or disposal? [§6518(m)(3)]	X			Depends on fossil fuel production. TR lines 251-253.
3. Are there any adverse impacts on biodiversity? (§205.200)				Overuse of sulfurous acid and subsequent acidification will cause the metabolism of microorganisms involved in compost and organic matter breakdown in treated streams and runoffs to be suppressed along the acidity gradient, and can lead to a decrease in humus production (Simon, et al., 2009). TR lines 333-336.
4. Does the substance contain inerts classified by EPA as 'inerts of toxicological concern'? [§6517 (c)(1)(B)(ii)]		X		TR line 229.
5. Is there potential for detrimental chemical interaction with other materials used in organic farming systems? [§6518(m)(1)]		?		The primary purpose of sulfurous acid for crop production is reducing the pH of irrigation water to alleviate the effects of specific saline/sodic soil conditions or the effects caused by saline or sodic irrigation. TR lines 295-297
6. Is there a toxic or other adverse action of the material or its breakdown products? [§6518(m)(2)]	X			Sulfurous acid is slightly irritating to the skin, and strongly irritating to the eyes. TR lines 364-365.
7. Is there persistence or concentration of the material or breakdown products in the environment? [§6518(m)(2)]		X		Hydrogen sulfite present in the solution is metabolized by sulfite reducing bacteria and plants that recycle sulfurous acid into bioavailable sulfur compounds. Water and other dissolved compounds leach into the soils. Functionally, sulfurous acid serves to condition soils by adjusting pH. TR lines 261-264.

8. Would the use of the substance be harmful to human health or the environment? [§6517 (c)(1)(A)(i); §6517 (c)(2)(A)(i); §6518(m)(4)]	?			It would be harmful if it discourages adoption of farm methods that prevent alkalinization and salinization of the soil, which have broader impacts than the particular farm where sulfurous acid might be used – such as creating a progressively more alkaline groundwater supply.
9. Are there adverse biological and chemical interactions in the agro-ecosystem? [§6518(m)(5)]		?		Overuse of sulfurous acid and subsequent acidification will cause the metabolism of microorganisms involved in compost and organic matter breakdown in treated streams and runoffs to be suppressed along the acidity gradient, and can lead to a decrease in humus production (Simon, et al., 2009). TR lines 333-336.
10. Are there detrimental physiological effects on soil organisms, crops, or livestock? [§6518(m)(5)]		?		Overuse of sulfurous acid and subsequent acidification will cause the metabolism of microorganisms involved in compost and organic matter breakdown in treated streams and runoffs to be suppressed along the acidity gradient, and can lead to a decrease in humus production (Simon, et al., 2009). TR lines 333-336.

Category 2. Is the Substance Essential for Organic Production? Sulfurous Acid

Question	Yes	No	N/A	Comments/Documentation (TAP; petition; regulatory agency; other)
1. Is the substance agricultural? [§6502(1)]		X		
2. Is the substance formulated or manufactured by a chemical process? [§6502(21)]	X			TR lines 250-256.
3. Is the substance formulated or manufactured by a process that chemically changes a substance extracted from naturally occurring plant, animal, or mineral sources? [§6502(21)]		X		Generally, the source of the sulfur is from fossil fuels. TR lines 250-253.
4. Is the substance created by naturally occurring biological processes? [§6502(21)]		X		See questions #2 and 3.
5. Is there a natural source of the substance? [§ 205.600(b)(1)]			X	
6. Is there an organic substitute? [§205.600(b)(1)]			X	
7. Is there a wholly natural substitute product? [§6517(c)(1)(A)(ii)]	X			Organic matter, pure sulfur, gypsum, compost, citric acid. TR lines 385-388.
8. Are there any alternative substances? [§6518(m)(6)]	X			See #7. Also, aquatic plant extracts, elemental sulfur, lignin sulfonate, humic acids and liquid fish extracts TR lines 395-397.

9. Are there other practices that would make the substance unnecessary? [§6518(m)(6)]	X			Proper irrigation, control of evapotranspiration, lining irrigation canals, salt-tolerant crops. TR lines 408-426.

Category 3. Is the substance compatible with organic production practices? Sulfurous Acid

Question	Yes	No	N/A	Comments/Documentation (TAP; petition; regulatory agency; other)
1. Is the substance consistent with organic farming and handling? [§6517(c)(1)(A)(iii); 6517(c)(2)(A)(ii)]		X		Not permitted in other countries. TR lines 184-215. IFOAM specifically states, "Operators shall prevent or remedy soil or water salinization where these pose a problem. Sulfurous acid is used as a remedy for salinization of soil" TR lines 214-215 Synthetic fertilizer. TR lines 146-147; 261-263.
2. Is the substance compatible with a system of sustainable agriculture? [§6518(m)(7)]		X		Used to correct impacts of poor irrigation practices. TR lines 127-141.
3. If used in livestock feed or pet food, Is the nutritional quality of the food maintained with the substance? [§205.600(b)(3)]			X	
4. If used in livestock feed or pet food, Is the primary use as a preservative? [§205.600(b)(4)]			X	
5. If used in livestock feed or pet food, Is the primary use to recreate or improve flavors, colors, textures, or nutritive value lost in processing (except when required by law)? [§205.600(b)(4)]			X	
6. Is the substance used in production, and does it contain an active synthetic ingredient in the following categories: [§6517(c)(1)(B)(i); copper and sulfur compounds	X			
toxins derived from bacteria		X		
pheromones, soaps, horticultural oils, fish emulsions, treated seed, vitamins and minerals		X		
livestock parasiticides and medicines		X		
production aids including netting, tree wraps and seals, insect traps, sticky barriers, row covers, and equipment cleansers		X		