

FORMAL RECOMMENDATION BY THE
NATIONAL ORGANIC STANDARDS BOARD (NOSB)
TO THE NATIONAL ORGANIC PROGRAM (NOP)

Date: November 30, 2007

Subject: Aqueous Potassium Silicate (as plant or soil amendment)

Chair: Andrea M. Caroe

Recommendation

The NOSB hereby recommends to the NOP the following:

Rulemaking Action:	<u>X</u>
Guidance Statement:	<u> </u>
Other:	<u> </u>

Statement of the Recommendation (including Recount of Vote):

To add aqueous potassium silicate as plant or soil amendment to §205.601(j) Synthetic substances allowed for use in organic crop production.

NOSB Vote: **Motion: G. Davis** **Second: J. Moyer**

*Board vote: Yes - 0 **No- 15** Abstain- 0 Absent - 0*

Rationale Supporting Recommendation (including consistency with OFPA and NOP):

As a plant or soil amendment, this synthetic substance does not satisfy the OFPA Criteria #2 of essentiality, as many silica containing natural substances are available for this use. It also fails to satisfy Criteria #3 in that it is incompatible with the provisions of OFPA and NOP regulation, being that synthetic potassium fertilizers are prohibited.

Sunset Material Vote

Response by the NOP:

NOSB COMMITTEE RECOMMENDATION

Form NOPLIST1. Committee Transmittal to NOSB

For NOSB Meeting: November 2007

Substance: Aqueous Potassium Silicate

Committee: Crops ☒ Livestock ☐ Handling ☐ Petition is for: Use as plant disease control §205.601(i), as insecticide §205.601(e), and as plant or soil amendments (for hydroponic use) §205.601(j) on the National List .

A. Evaluation Criteria (Applicability noted for each category; Documentation attached) Criteria Satisfied? (see B below)

1. Impact on Humans and Environment

insecticide §205.601(e) Yes ☒ No ☐ N/A ☐
plant disease control §205.601(i) Yes ☒ No ☐ N/A ☐
plant or soil amendments (for hydroponic use) §205.601(j) Yes ☒ No ☐ N/A ☐

2. Essential & Availability Criteria

insecticide §205.601(e) Yes ☐ No ☒ N/A ☐ (Dissenting member – yes)
plant disease control §205.601(i) Yes ☐ No ☒ N/A ☐ (Dissenting member – yes)
plant or soil amendments (for hydroponic use) §205.601(j) Yes ☐ No ☒ N/A ☐

3. Compatibility & Consistency

insecticide §205.601(e) Yes ☐ No ☒ N/A ☐ (Dissenting member – yes)
plant disease control §205.601(i) Yes ☐ No ☒ N/A ☐ (Dissenting member – yes)
plant or soil amendments (for hydroponic use) §205.601(j) Yes ☐ No ☒ N/A ☐

4. Commercial Supply is Fragile or Potentially Unavailable as Organic (only for 606) Yes ☐ No ☐ N/A ☒

B. Substance Fails Criteria Category: 2 & 3 Comments:

Majority: Criteria #2 - multiple substitutes are available Criteria #3 – synthetic soil applied fertilizers not compatible with organic farming regulations

Minority: As insecticide and plant disease control, the material favorably satisfies Criteria 1, 2, and 3 and should be added to the National List. Information provided in TAP report amply supports prohibition of the material as plant or soil amendment, but does not provide ample support for failing any of the evaluation criteria for the material as insecticide or plant disease control. Previous NOSB Crops Committee (2003) voted 4-0 to approve these uses. At May 2003 NOSB meeting, material was deferred for later vote pending eventual EPA pesticide registration.

C. Proposed Annotation (if any): No industrial by-products allowed in manufacture.

Basis for annotation: To meet criteria above: _____ Other regulatory criteria: _____ Citation: _____

D. Recommended Committee Action & Vote (State Actual Motion): Add aqueous potassium silicate on the National List for use as:

insecticide §205.601(e)- Motion: GD Seconded: JM Yes: 1 No: 3 Absent: 2
plant disease control §205.601(i)- Motion: GD Seconded: JM Yes: 1 No: 3 Absent: 2
plant or soil amendments (for hydroponic use) §205.601(j)- Motion: GD Seconded: JM Yes: 0 No: 4 Absent: 2

Motion by: _____ Seconded: _____ Yes: _____ No: _____ Absent: _____ Abstain: _____

Crops	☒	Agricultural		Allowed ¹	
Livestock		Non-Synthetic		Prohibited ²	
Handling		Synthetic	☒	Rejected ³	X
No restriction		Commercially Un-Available as Organic ¹		Deferred ⁴	

1) Substance voted to be added as “allowed” on National List to § 205. _____ with Annotation (if any) _____

2) Substance to be added as “prohibited” on National List to § 205. _____ with Annotation (if any) _____

Describe why a prohibited substance: _____

3) Substance was rejected by vote for amending National List to § 205.601. Describe why material was rejected:
Failed evaluation criteria 2 & 3

4) Substance was recommended to be deferred because _____

_____ If follow-up needed, who will
follow up _____

E. Approved by Committee Chair to transmit to NOSB:

Gerald Davis
Committee Chair

9/21/07
Date

NOSB EVALUATION CRITERIA FOR SUBSTANCES ADDED TO THE NATIONAL LIST

Category 1. Adverse impacts on humans or the environment?

Substance – Aqueous Potassium Silicate

Question	Yes	No	N/A ¹	Documentation (TAP; petition; regulatory agency; other)
1. Are there adverse effects on environment from manufacture, use, or disposal? [§205.600 b.2]			X	
2. Is there environmental contamination during manufacture, use, misuse, or disposal? [§6518 m.3]		X		The manufacturing process does not appear to pose a substantial risk of environmental contamination other than the combustion of fossil fuels to power the reaction. Annotation to prohibit the use of industrial byproducts in manufacture would be needed. Proper use and disposal of the material is unlikely to cause risk to the environment. (TAP pg4, item #3). Unlikely environmental contamination except for the possibility of harm to aquatic species if bulk material was improperly disposed of in a body of water.
3. Is the substance harmful to the environment? [§6517c(1)(A)(i);6517(c)(2)(A)i]		X		Material has no known chronic hazards and applications will not result in any environmentally persistent byproducts.(TAP pg3, item #2)
4. Does the substance contain List 1, 2, or 3 inerts? [§6517 c (1)(B)(ii); 205.601(m)2]	X	X		The revised petition (2006) states that the material is on EPA List 4B. The TAP report (2003) states that potassium silicate is on EPA List 3.
5. Is there potential for detrimental chemical interaction with other materials used? [§6518 m.1]		X		Little or no adverse reactions expected. High solution pH of spray mixture can be mitigated with acidifying materials from The Allowed Substance List for use with alkaline sensitive materials or alkali sensitive plants. (TAP pg3 & pg11, item #1)
6. Are there adverse biological and chemical interactions in agro-ecosystem? [§6518 m.5]		X		Not when used as foliar applied disease control or insecticide. Successive silicate fertilizer application could raise soil pH to levels that adversely affect plant growth. (TAP pg 5, item #5)
7. Are there detrimental physiological effects on soil organisms, crops, or livestock? [§6518 m.5]		X		Same as question # 6.
8. Is there a toxic or other adverse action of the material or its breakdown products? [§6518 m.2]		X		See question # 3.
9. Is there undesirable persistence or concentration of the material or breakdown products in environment?[§6518 m.2]		X		Breakdown products of the material are naturally occurring in practically all animal species and ecosystems. Dissolved potassium and silica species are indistinguishable from their naturally occurring analogs. (TAP pg 3, item #2)
10. Is there any harmful effect on human health? [§6517 c (1)(A)(i) ; 6517 c(2)(A)i; §6518 m.4]		X		The effects of potassium silicate applications on human health are likely to be minimal. Proper skin and respiratory protection for spray applicators of the material would be required to prevent acute overexposure. (TAP pg4, item # 4)
11. Is there an adverse effect on human health as defined by applicable Federal regulations? [205.600 b.3]			X	
12. Is the substance GRAS when used according to FDA's good manufacturing practices? [§205.600 b.5]			X	
13. Does the substance contain residues of heavy metals or other contaminants in excess of FDA tolerances? [§205.600 b.5]			X	

¹If the substance under review is for crops or livestock production, all of the questions from 205.600 (b) are N/A—not applicable.

Category 2. Is the Substance Essential for Organic Production? Substance - Aqueous Potassium Silicate

Question	Yes	No	N/A ¹	Documentation (TAP; petition; regulatory agency; other)
1. Is the substance formulated or manufactured by a chemical process? [6502 (21)]	X			TAP pg 2
2. 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			TAP pg 2 Aqueous potassium silicate is manufactured using a calcination process that combines natural silica sand and potassium carbonate at high temperatures. The two substances fuse into glass, which is dissolved with high pressure steam to form a clear, slightly viscous liquid.
3. Is the substance created by naturally occurring biological processes? [6502 (21)]		X		Aqueous potassium silicate does not occur in nature.
4. Is there a natural source of the substance? [§205.600 b.1]			X	
5. Is there an organic substitute? [§205.600 b.1]			X	
6. Is the substance essential for handling of organically produced agricultural products? [§205.600 b.6]			X	
7. Is there a wholly natural substitute product? [§6517 c (1)(A)(ii)]	X	X		Bacillus subtilis, Bacillus pumilus, milk, whey, canola oil, rosemary oil, garlic oil and neem oil. Botanical insecticides such as neem or pyrethrin. Effective natural fungicides and insecticides are very limited in number and effectiveness. As silica soil amendments, greensand, wollastonite, various other rock dusts.
8. Is the substance used in handling, not synthetic, but not organically produced? [§6517 c (1)(B)(iii)]			X	
9. Is there any alternative substances? [§6518 m.6]	X			Sulfur and copper as fungicides, horticultural oils as fungicides and insecticides.
10. Is there another practice that would make the substance unnecessary? [§6518 m.6]	X			Variety selection, green manure cover crops and crop rotations

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Category 3. Is the substance compatible with organic production practices? Substance – Aqueous potassium silicate

Question	Yes	No	N/A ¹	Documentation (TAP; petition; regulatory agency; other)
1. Is the substance compatible with organic handling? [§205.600 b.2]			X	
2. Is the substance consistent with organic farming and handling? [§6517 c (1)(A)(iii); 6517 c (2)(A)(ii)]	X	X		No, the use of this synthetic material as a soil /plant amendment is not compatible with organic farming rules. Yes, the use of this material as plant disease control and as insecticide could be considered consistent with organic farming and could help replace some uses of other synthetics such as copper and sulfur. (TAP pg 6 & 8, item #7; Pg 8, item #6; pg 8 & 12, Recommendations to NOSB)
3. Is the substance compatible with a system of sustainable agriculture? [§6518 m.7]	X			TAP pg 6 & 8, item #7
4. Is the nutritional quality of the food maintained with the substance? [§205.600 b.3]			X	
5. Is the primary use as a preservative? [§205.600 b.4]			X	
6. Is the primary use to recreate or improve flavors, colors, textures, or nutritive values lost in processing (except when required by law, e.g., vitamin D in milk)? [205.600 b.4]			X	
7. Is the substance used in production, and does it contain an active synthetic ingredient in the following categories:				
a. copper and sulfur compounds;		X		
b. toxins derived from bacteria;		X		
c. pheromones, soaps, horticultural oils, fish emulsions, treated seed, vitamins and minerals?	X			It is a mineral – potassium and silica are minerals
d. livestock parasiticides and medicines?		X		
e. production aids including netting, tree wraps and seals, insect traps, sticky barriers, row covers, and equipment cleaners?		X		

¹If the substance under review is for crops or livestock production, all of the questions from 205.600 (b) are N/A—not applicable.

Category 4. Is the commercial supply of an agricultural substance as organic, fragile or potentially unavailable? [§6610, 6518, 6519, 205.2, 205.105 (d), 205.600 (c) 205.2, 205.105 (d), 205.600 (c)]

Substance - _____

Question	Yes	No	N/A	Comments on Information Provided (sufficient, plausible, reasonable, thorough, complete, unknown)
1. <u>Is the comparative description provided</u> as to why the non-organic form of the material /substance is necessary for use in organic handling?				
2. Does the current and historical industry information, research, or evidence provided explain how or why the material /substance cannot be obtained organically in the appropriate form to fulfill an essential function in a system of organic handling?				
3. Does the current and historical industry information, research, or evidence provided explain how or why the material /substance cannot be obtained organically in the appropriate quality to fulfill an essential function in a system of organic handling?				
4. Does the current and historical industry information, research, or evidence provided explain how or why the material /substance cannot be obtained organically in the appropriate quantity to fulfill an essential function in a system of organic handling?				
5. Does the industry information provided on material / substance non-availability as organic, include (but not limited to) the following:				
a. Regions of production (including factors such as climate and number of regions);				
b. Number of suppliers and amount produced;				
c. Current and historical supplies related to weather events such as hurricanes, floods, and droughts that may temporarily halt production or destroy crops or supplies;				
d. Trade-related issues such as evidence of hoarding, war, trade barriers, or civil unrest that may temporarily restrict supplies; or				
e. Are there other issues which may present a challenge to a consistent supply?				

