

Formal Recommendation
From: National Organic Standards Board (NOSB)
To: the National Organic Program (NOP)

Date: October 29, 2015

Subject: Petition to add Brown Seaweed Extract to §205.601

NOSB Chair: Jean Richardson

The NOSB hereby recommends to the NOP the following:

Rulemaking Action: None. Motion failed

Statement of the Recommendation:

The Crops Subcommittee received a petition from BioAtlantis, Ltd. for Brown Seaweed Extract in early 2015 for use as a plant strengthener or fertilizer used to improve shoot growth and seed germination. Although described as a plant strengthener, the two products were labeled as a 0-0-3 fertilizer and a 0-0-1 fertilizer. Material use is through foliar applications or fertigation.

There is a 3 step manufacturing process whereby 1) seaweed is harvested and extracted w/tap water whose pH is lowered to a 3.5 minimum by adding a low concentration of sulfuric acid 2) the mixture is centrifuged to separate seaweed insoluble from liquid extract and 3) potassium hydroxide is added to adjust the pH of the liquid extract to near neutral.

Brown Seaweed Extract is similar to Laminarin, in that both are seaweed extracts, both use sulfuric acid and potassium hydroxide for extraction. However, in this instance the Subcommittee determined that the Brown Seaweed Extract material should be classified as synthetic per the draft Guidance on Classification of Materials because the fertilizer use of brown seaweed (on the National List as Aquatic Plant Products) only allows potassium hydroxide but not sulfuric acid. The addition of sulfuric acid has a “functional effect” in the final product.

Rationale Supporting Recommendation (including consistency with OFPA and Organic Regulations):

Because OFPA prohibits the use of any fertilizers containing synthetic ingredients and we do not wish to add sulfuric acid to the list for this purpose, Brown Seaweed as petitioned cannot be added to the National List.

The motion refers to specifically the formulation of the brown seaweed that was petitioned. Other brown seaweed products are included under the National List material "Aquatic Plant Extracts"

NOSB Vote:

Motion to classify Brown Seaweed Extracts as petitioned as synthetic.

Motion by: Carmela Beck

Seconded by: Harold Austin

Yes: 14 No: 0 Abstain: 0 Absent: 0 Recuse: 0

Motion to add Seaweed Extracts as petitioned at 205.601

Motion by: Carmela Beck

Seconded by: Harold Austin

Yes: 0 No: 14 Abstain: 0 Absent: 0 Recuse: 0

Outcome: motion failed

National Organic Standards Board
Crops Subcommittee
Petitioned Material Proposal
Brown Seaweed Extracts
August 4, 2015

Introduction

In 2015, the NOSB received a petition from BioAtlantis, Ltd. for Brown Seaweed Extract used as a plant strengthener (fertilizer) primarily to improve shoot growth and seed germination, increase root growth and improve soil microbial count for use in various fruits, vegetables and cereal crops. Petitioned substance is to be considered as a synthetic substance allowed for use in organic production, as set in 205.601 of the USDA organic regulations. Because of their similarities, the petition for Brown Seaweed Extract and Laminarin are concurrently being reviewed, note however that Laminarin was petitioned for use in disease control while this brown seaweed is a fertilizer. At the NOSB Spring, 2014 meeting, Laminarin was referred back to the Subcommittee and a [Limited Scope Technical Review](#) was requested to determine if the extraction and purification process resulted in a synthetic or non-synthetic material. That TR was completed in May 2015.

Background

The National Organic Program notes that accompanied this petition stated that Brown Seaweed Extracts have some similarities to the outstanding petition for Laminarin, since both are seaweed extracts that use sulfuric acid for pH adjustment. During their preliminary review of Laminarin, the NOP determined that the material could be classified as non-synthetic. The NOP did not make a final determination, but rather requested that the NOSB decide upon its classification status. Similarly, the Subcommittee must also determine whether or not Brown Seaweed Extract should be classified as synthetic or non-synthetic.

In order to do this, the Subcommittee reviewed the draft Guidance on Classification of Materials, including the following excerpt to finalize the classification determination:

4.6 Extraction of Nonorganic Materials

Some materials are produced using manufacturing processes that involve separation techniques, such as the steam distillation of oil from plant leaves. Separation and extraction methods may include, but are not limited to, distillation, solvent extraction, acid-base extraction, and physical or mechanical methods (e.g., filtration, crushing, centrifugation, or gravity separation).

For purposes of classification of a material as synthetic or nonsynthetic, a material may be classified as nonsynthetic (natural) if the extraction or separation technique results in a material that meets the following criteria:

- 1) At the end of the extraction process, the material has not been transformed into a different substance via chemical change;
- 2) The material has not been altered into a form that does not occur in nature; and
- 3) Any synthetic materials used to separate, isolate, or extract the substance have been removed from the final substance (e.g., via evaporation, distillation, precipitation, or other means) such that they have no technical or functional effect in the final product.

Discussion

Brown seaweed extract (made from the following two species: *Laminaria* species or *Ascophyllum nodosum*) is composed of naturally occurring components extracted from seaweed, such as laminarin or fucoidan. The petition claims that the material helps with crop protection by strengthening plant health (Petition, page 5). Although described as a plant strengthener, the two products are labeled as a 0-0-3 fertilizer and a 0-0-1 fertilizer. Material use is through foliar applications or fertigation. Brown seaweed extracts are harvested in Ireland; the petitioner indicates that no environmental impacts have been detected until now. The Laminarin TR goes to great length to describe French government regulations in place to ensure that seaweed harvesting is sustainable.

The petitioner describes a 3-step manufacturing process that includes: 1) seaweed is harvested and extracted with tap water whose pH is lowered to a 3.5 minimum by adding a low concentration of sulfuric acid. Petitioner clarifies that the use of acid at low levels is neutralized and acts as a processing aid only; 2) mixture is centrifuged to separate seaweed insoluble from liquid extract; and 3) potassium hydroxide is added to adjust pH of liquid extract to near neutral. Sulfuric acid is NOP allowed for use to adjust the pH of liquid fish products when the amount used does not exceed the minimum needed to lower the pH to 3.5. Petitioner further clarifies that the addition of potassium hydroxide completely eliminates all trace of sulfuric acid.

The Laminarin TR describes the physical extraction methods including grinding, precipitation in an acid or base medium, ultrafiltration, and dialysis; refer to Table 2 under Question #2 for a summary of extraction methods. Laminarin TR lines 247 – 259, refer to research backing the claim that the addition of sulfuric acid does not modify the structure of Laminarin; the sulfuric acid is used as a processing aid to facilitate filtration (Laminarin TR, lines 263 – 264). Furthermore, Laminarin TR question #3, lines 316 – 317, states the following: “In all extraction scenarios, the literature does not suggest that the residual ions resulting from the acid-base reactions lend any technical or functional effect in the laminarin ingredient once it is completely extracted.” In conclusion, the Laminarin Limited Scope TR clarified the following two items, 1) the chemical structure of the material is not modified and 2) the sodium and sulfate ion synthetic residuals from the manufacturing process have no technical effect in the final product. For the abovementioned reasons, Laminarin is classified as non-synthetic.

In contrast, the Crops Subcommittee has determined that the Brown Seaweed must be classified as synthetic because potassium hydroxide is utilized in the manufacturing process. Per the [draft Guidance on Classification of Materials](#) (4.6-3), *any synthetic materials used to separate, isolate, or extract the substance [must] have been removed from the final substance (e.g., via evaporation, distillation, precipitation, or other means) such that they have no technical or functional effect in the final product.* Potassium hydroxide is added during the manufacturing process to establish a near neutral pH; this addition has a “functional effect” in the final product. Because OFPA prohibits the use of any fertilizers containing synthetic ingredients, Brown Seaweed as petitioned cannot be added to the National List.

Evaluation Criteria (see attached checklist for criteria in each category)

	Criteria Satisfied?
1. Impact on Humans and Environment	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
2. Essential & Availability Criteria	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
3. Compatibility & Consistency	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A

Substance Fails Criteria Category: 3

Subcommittee Action & Vote

Classification Motion:

Motion to classify Brown Seaweed Extracts as petitioned as synthetic.

Motion by: Carmela Beck

Seconded by: Harold Austin

Yes: 5 No: 0 Abstain: 0 Absent: 0 Recuse: 0

Listing Motion:

Motion to add Seaweed Extracts as petitioned at 205.601

Motion by: Carmela Beck

Seconded by: Harold Austin

Yes: 0 No: 5 Abstain: 0 Absent: 0 Recuse: 0

Approved by Zea Sonnabend, Subcommittee Chair, to transmit to NOSB August 25, 2015

NOSB Evaluation Criteria for Substances Added To the National List - Crops

Category 1. Adverse impacts on humans or the environment? Laminarin

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		
2. Is there a probability of environmental contamination during, manufacture or disposal? [§6518(m)(3)]		X		See Laminarin TR evaluation Question #6, (lines 319 – 388)
3. Are there any adverse impacts on biodiversity? (§205.200)		X		
4. Does the substance contain inerts classified by EPA as ‘inerts of toxicological concern’? [§6517 (c)(1)(B)(ii)]		X		
5. Is there potential for detrimental chemical interaction with other materials used in organic farming systems? [§6518(m)(1)]		X		
6. Is there a toxic or other adverse action of the material or its breakdown products? [§6518(m)(2)]		X		
7. Is there persistence or concentration of the material or breakdown products in the environment? [§6518(m)(2)]		X		
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)]		X		
9. Are there adverse biological and chemical interactions in the agro-ecosystem? [§6518(m)(5)]		X		
10. Are there detrimental physiological effects on soil organisms, crops, or livestock? [§6518(m)(5)]		X		

NOSB Evaluation Criteria for Substances Added To the National List - Crops

Category 2. Is the Substance Essential for Organic Production? Substance: Laminarin

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			
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			The manufacture of brown seaweed extracts utilizes potassium hydroxide to lower the pH
4. Is the substance created by naturally occurring biological processes? [§6502(21)]		X		
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	
8. Are there any alternative substances? [§6518(m)(6)]		X		Petitioner unaware of any non-synthetic or synthetic substances on the National List or alternative agricultural methods that could be used to replace Brown Seaweed Extracts (Petition, page 5)
9. Are there other practices that would make the substance unnecessary? [§6518(m)(6)]		X		