

National Organic Standards Board
Crops Subcommittee
Petitioned Material Proposal
Soywax
July 5, 2016

Summary of [Petition](#):

Soy wax has been petitioned as a synthetic substance for use in organic mushroom production to seal plugs and ends of logs inoculated with mushroom spawn. Soy wax is intended to be used for the same purpose as microcrystalline cheesewax, which is currently listed at §205.601(o) as a production aid in the production of saprophytic mushrooms grown on logs.

Summary of Review:

Soy wax is produced from oil extracted from soybeans. The oil is hydrogenated, making it a solid at room temperature. Crystalline cheesewax, which is currently listed for the use, is made from petroleum. Soy wax, which is now available from non-GMO, domestically-produced soybeans, was petitioned for use because it has fewer environmental and health impacts than products made from petroleum.

Sox wax is considered synthetic because when it is hydrogenated, it undergoes a chemical change that does not happen naturally. Hydrogenation is the process whereby the poly- and mono-unsaturated oils are turned into saturated oils, solidifying them in order to increase the viscosity. As the petition describes it, this process involves the reaction of hydrogen with soybean oil at elevated temperature (140-225°C) in the presence of a nickel catalyst. Therefore, even if soy wax were made from organic soybeans by this process, it would be synthetic.

A proposal to add soy wax to §205.601 was considered at the April 2016 meeting in Washington, D.C., but was referred back to the Crops Subcommittee for further discussion.

The Crops Subcommittee supports the addition of soy wax made from non-GMO soybeans to the National List as an alternative to microcrystalline cheesewax, which is made from petroleum.

Category 1: Classification

1. For CROP use: Is the substance Non-synthetic or Synthetic? Substance is synthetic
Is the substance formulated or manufactured by a process that chemically changes a substance extracted from naturally occurring plant, animal, or mineral sources? [OFPA §6502(21)] If so, describe, using NOP 5033-1 as a guide.

Yes, the soybean oil is hydrogenated, a process in which double bonds between carbon and hydrogen atoms in the oil are converted into single bonds to make saturated fats. This is a chemical (synthetic) process that is accomplished by the reaction of hydrogen with the oil at elevated temperature (140-225° C) in the presence of a nickel catalyst.

2. Reference to appropriate OFPA category:
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; toxins derived from bacteria; pheromones, soaps, horticultural oils, fish emulsions, treated seed, vitamins and minerals; livestock parasiticides and medicines and production aids including netting, tree wraps and seals, insect traps, sticky barriers, row covers, and equipment cleansers; or (ii) is used in

production and contains synthetic inert ingredients that are not classified by the Administrator of the Environmental Protection Agency as inert or of toxicological concern?

Yes, soy wax is used as a production aid

Category 2: Adverse Impacts

1. What is the potential for the substance to have detrimental chemical interactions with other materials used in organic farming systems? [§6518(m)(1)]

Vegetable oils are not very reactive chemically and they biodegrade readily in the soil.

2. What is the toxicity and mode of action of the substance and of its breakdown products or any contaminants, and their persistence and areas of concentration in the environment? [§6518(m)(2)]

There should not be any because vegetable oils are not toxic and fully biodegrade in the soil. The breakdown products are carbon dioxide and water.

3. Describe the probability of environmental contamination during manufacture, use, misuse or disposal of such substance? [§6518(m)(3)]

The process of hydrogenation involves dissolving hydrogen in soybean oil in the presence of heat and a nickel catalyst. No other chemical inputs are required or need to be disposed of.

4. Discuss the effect of the substance on human health. [§6517(c)(1)(A)(i); §6517(c)(2)(A)(i); §6518(m)(4)].

Hydrogenated soy oil is considered a trans-fatty acid, which has been shown to increase the risk of heart disease, so nutritionists recommend avoiding it in human diets. However, little--if any--soy wax is expected to be consumed in edible mushrooms that have been grown on logs treated with soy wax.

5. Discuss any effects the substance may have on biological and chemical interactions in the agroecosystem, including the physiological effects of the substance on soil organisms (including the salt index and solubility of the soil), crops and livestock. [§6518(m)(5)]

Soy wax is hydrogenated soybean oil and is non-toxic and biodegradable in soil. Soybean oil is commonly used in livestock feeds.

6. Are there any adverse impacts on biodiversity? (§205.200)

There should not be any adverse impacts on biodiversity because soybean oil is nontoxic and readily degraded by soil organisms.

Category 3: Alternatives/Compatibility

1. Are there alternatives to using the substance? Evaluate alternative practices as well as non-synthetic and synthetic available materials. [§6518(m)(6)]

The currently used alternative is microcrystalline cheesewax, a synthetic made from petroleum, which is on the National List.

2. In balancing the responses to the criteria above, is the substance compatible with a system of sustainable agriculture? [§6518(m)(7)]

Yes, it is more compatible than the petroleum-based material currently being used for mushroom production.

Classification Motion:

Motion to classify soy wax as synthetic

Motion by: Francis Thicke

Seconded by: Harold Austin

Yes: 7 No: 0 Abstain: 0 Absent: 0 Recuse: 0

National List Motion:

Motion to add soy wax at §205.601 of the National List (o) As production aids. Soy wax (CAS # 8016-70-4)--for use in log grown mushroom production. Must be made from soybeans grown without excluded methods if soy wax from organic soybeans is not commercially available.

Motion by: Francis Thicke

Seconded by: Emily Oakley

Yes: 7 No: 0 Abstain: 0 Absent: 0 Recuse: 0