

**National Organic Standards Board
Crops Subcommittee
Petitioned Material Proposal
C6, C8, C10, C12 Naturally Derived Fatty Alcohol/MASCOL80
July 16, 2019**

Summary of Petition

A petition requesting the addition of revised active ingredient C6, C8, C10, C12 naturally derived fatty alcohol was received by the NOSB in December 2018 to be added to section §205.601(k) of the National List. The Petition asks for the substance to be annotated for “sucker control on organic tobacco crops”. The petitioner has made numerous revisions to the original petition (2015). According to Dr. Clarissa Matthews, “the original petition was for use in tobacco and other crops, contained reference to multiple materials including inerts, and did not specify the range of fatty alcohols in the material MASCOL80. The re-petition as revised specifies use on tobacco only, clarifies material being petitioned, and includes the full range of alcohols (i.e., C6-C12) in MASCOL80.”

The NOSB’s Formal recommendation on November 2, 2017 to the NOP, stated among other issues, the use of a synthetic growth regulator is not compatible with a system of sustainable and organic agriculture. The re-petition specifies the need of this synthetic growth regulator on organic tobacco for sucker control. There could be a human health concern caused by exposure to nicotine when hand suckering. The NOSB also received a petitioned signed by many tobacco farmers, stating they need this material, which had been allowed by a few organic certifiers in the past. Growing organic tobacco can be one organic crop in a longer crop rotation. Some producers have stated if this material is not approved, they may choose to no longer grow the other crops organically on their farms.

The NOSB will review the action of fatty alcohols as a synthetic growth regulator and its compatibility with a system of sustainable and organic agriculture. Currently, EPA’s registration for this material is limited to use on tobacco and the technical review received by the NOSB only discussed fatty alcohols for the EPA registered use.

Category: Synthetic Substance Allowed for Use in Organic Crop Production

NOP Reference: 205.601 Synthetic Substance Allowed for use in Organic Crop Production.

NOP Section: 205.601(k)(2) - As a Plant Growth Regulator

Requested Annotation: For sucker control in organic tobacco production

Category 1: Classification

1. For CROP use: This 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.

Fatty alcohols can be produced from natural fats from plants or animals, or from petroleum sources. In either case, chemical changes are required to produce fatty alcohols.

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 inerts of toxicological concern?

Fatty alcohols do not fall into any of the OFPA categories. Fatty alcohols produced as a mixture of four aliphatic alcohols are not considered inert by the Environmental Protection Agency nor are they included in List 4. Fatty alcohols may be registered with the EPA only for tobacco sucker control. N-decyl alcohol (decanol) and n-octyl alcohol (octanol) are individually approved by the US Food and Drug Administration (FDA) for food and non-food use as solvents or co-solvents.

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?

There appears to be no known detrimental chemical interactions between fatty alcohols and other materials used in organic farming systems. Mineral oil, cooking oil or paraffin oil are currently the only topping and suckering substances used by organic crop producers and there is no proven adverse impact with these substances.

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)]

The log Kow is an indicator of a chemical's tendency to bioaccumulate. The TR reports log Kow's for octanal and decanol at 3.15 and 4.57 respectively, which are moderately low. The TR also notes that linear fatty alcohols in general are easily biodegradable.

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

According to the Safer Choice determination of the EPA, 1-decanol, 1-octanol, 1-dodecanol and the C₆-C₁₂ alcohols are expected to be of low concern for environmental contamination based on experimental and modeled data. Linear fatty alcohols in general are easily biodegradable. The solubility of fatty alcohols in water decreases with an increasing C-chain length. Fatty alcohols possess only moderate acute toxicity for aquatic organisms. In general, in their range of water solubility no toxic effects are observed.

The fatty alcohols from both natural and manufactured sources represent a low risk for environmental contamination.

4. Discuss the effect of the substance on human health.

There is no evidence to suggest that the aliphatic alcohols cause increased susceptibility to health problems in infants and children. Based on the results of the available studies, no endpoints of toxicological concern have been identified for human health risk assessment

purposes. The EPA concluded that there are no human risks of concern for aliphatic alcohols (TR lines 396 – 399).

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)]

When fatty alcohols are applied to tobacco plants for suckering with a surfactant such as tween 80, an average residue of 1.6 parts per million (ppm) of the applied fatty alcohols and 1.0 ppm of the surfactant remain on the cured leaves. Over 7000 ppm of naturally occurring fatty alcohols are also present in and on the cured leaves. Fatty alcohols induce a low incidence of polynucleate root tip cells or root tip cells with fragmented nuclei. The fatty alcohols are produced naturally, in all living organisms, from bacteria to man, and thus, are widely present throughout the natural world. In any agro-ecosystem, fatty alcohols will be present from natural sources. The introduction of C₆-C₁₂ fatty alcohols for topping and suckering may produce short term toxicity to many organisms in the range of 1-100 milligrams/liter, however; because the application rate is intermittent, and biodegradability and removal rate are high for this substance no readily observable effects occur in the agroecosystem (TR lines 342-352).

6. Are there any adverse impacts on biodiversity? (§205.200)
Fatty alcohols are chemicals that naturally occur in all plants and animals. They are known for their high level of biodegradability in the environments. Their derivative products are additionally designed to rapidly degrade after use and are not considered endocrine disrupters.

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)]

Topping may be done by hand or with special machines that cut the flower heads and sacrifice a few leaves. Topping requires two or three trips over the field to catch all the plants. Suckers can be removed by hand as well as stunted by carefully applying approved soybean oil or mineral oil to the top of the plant. Topping and suckering are the most time-consuming tasks associated with growing organic tobacco and may be necessary every week for 10 weeks.

One issue with suckering and topping is tobacco toxicity to workers performing the task. Tobacco is well documented as having negative human health effects (i.e. cancer, heart attack, lung disease) when in contact with skin or mucous membranes. Workers in contact with tobacco plants may also experience nausea and other health concerns from tobacco poisoning.

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

The review and subsequent denial of the fatty alcohol petition at the Fall 2017 NOSB revolved around several issues. First, the uses requested for the petitioned material were broad and extended beyond the limited use for tobacco desuckering. Since other uses for the petitioned material were not allowed by the Environmental Protection Agency, the board was faced with either adding an annotation to the listing or denying the petition. Secondly, the petition was not clear as to which fatty alcohols were being requested. The petition contained reference to multiple materials including inerts, and did not specify the range of fatty alcohols being

requested. Thirdly, there was little evidence provided for essentiality to organic production in the original petition. The Board received few comments noting that this material was essential for organic tobacco production. The Board was also not aware that fatty alcohols had been approved by some certifiers and not by others and that some growers were already using this material.

During review of the current petition several of these issues have been addressed. First, the current petition is limited to the use of fatty alcohols for organic tobacco production. Secondly, the fatty alcohols being requested are clearly spelled out and match those available in the products previously allowed by some certifiers. Thirdly, the Board received numerous comments during the Spring 2019 Board meeting noting the essentiality of this material to organic tobacco growers. These comments were received even though the material was not on the meeting agenda. Numerous tobacco growers noted that without this material, they would be unable to produce organic tobacco and would most likely drop their organic certification, including the certification for crops they use in rotation with tobacco. The reasons for essentiality included:

- Other currently available materials are ineffective or sporadically effective whereas fatty alcohols are effective and reliable.
- Manual desuckering involves numerous passes through the fields and exposes workers to the potential for tobacco poisoning and numerous health issues. The use of fatty alcohols prevents this exposure and is necessary to protect human health.
- The suckers on tobacco plants provide habit for aphids and increase the susceptibility of the plant to other pests. Desuckering the plants reduces pest pressure.

The crops subcommittee is well aware of the negative impacts on human health of tobacco use. However, tobacco is a legal crop and a crop eligible for organic certification. Like any other material reviewed for use on organic crops, the committee is limiting our review to whether the material meets the criteria necessary for adding it to the National List as a crop production aid. Since fatty alcohols occur naturally throughout the plant world, break down readily after use, help to prevent worker exposure to tobacco poisoning, and reduce insect problems, they are compatible with a system of sustainable agriculture.

Minority opinion:

During its Fall 2017 board meeting, the NOSB determined that the use of a synthetic plant growth regulator for sucker control of tobacco is not compatible with a system of organic agriculture. Following the re-petition of this material, the NOSB heard from numerous organic tobacco farmers in the spring of 2019 who rely on this material. While the testimony provided by growers was compelling and included worker health concerns and some associated pest prevention benefits, the primary reason for the petition of this material is to enable greater economic returns.

The TR for this material notes that fatty alcohols do not fall into any of the OFPA categories. Additionally, it states:

"The aim of sucker control is to focus the plant's energy into filling the leaves rather than growing the flower. Because tobacco sells by weight, heavier leaves are favored economically. In organic tobacco production, early topping to improve yield and quality is usually done by hand. Suckers can be removed by hand as well as stunted by carefully applying approved soybean oil or mineral oil to the top of the plant." (TR Lines 494-498)

Although manual control is clearly more expensive, the same can be said for manual sucker removal on tomatoes, for example, a task that requires weekly labor during the growing season. Allowing fatty alcohols to replace manual practices in tobacco would have the effect of subsidizing tobacco with a synthetic material over a crop like tomatoes, where similar hand removal of suckers is often required.

The foundation of organic agriculture is predicated on using natural, manual, mechanical, and cultural controls over synthetic materials. In many cases, this means utilizing hand labor and is part of why organic receives a price premium. Labor saving and greater economic returns are insufficient criteria for adding a synthetic material to the National List.

Classification Motion:

Motion to classify fatty alcohols C6, C8, C10, C12 naturally derived fatty alcohol as synthetic.

Motion by: Jesse Buie

Seconded by: Harriet Behar

Yes: 7 No: 0 Abstain: 0 Absent: 1 Recuse: 0

National List Motion:

Motion to add fatty alcohols C6, C8, C10, C12 Naturally Derived Fatty Alcohol at 205.601 for sucker control on organic tobacco crops.

Motion by: Jesse Buie

Seconded by: Rick Greenwood

Yes: 4 No: 2 Abstain: 1 Absent: 1 Recuse: 0

Approved by Steve Ela, Crop Subcommittee Chair, to transmit to NOSB August 14, 2019