

**National Organic Standards Board
Crops Subcommittee
Petitioned Material Proposal
1-Methylcyclopropene (1-MCP)**

July 5, 2016

Summary of Petition

The NOSB Crops Subcommittee received a proposal for 1-Methylcyclopropene (1-MCP) to add to the National List at §205.601. The proposed use is as a post-harvest treatment for apples to delay fruit ageing and slow down ripening so that the apples can be stored for a longer period. It was noted that the condition of the fruit was improved after it is removed from storage until it reaches consumers. The product, as petitioned, is used in sealed storage rooms. A technical report was not requested for this material because there was sufficient information in the petition for the review.

1-Methylcyclopropene (1-MCP) binds to ethylene receptor sites and slows ethylene activity, thus slowing ripening. 1-MCP is a hydrocarbon gas with a similar structure to ethylene although it does not occur in nature. The ethylene receptor sites have a higher affinity for 1-MCP than ethylene. The generic material is always formulated with a natural sugar (alpha cyclodextrin) to stabilize the gas.

Summary of Review:

The Subcommittee notes that while the manufacturing process of this substance is proprietary, enough information was provided in the petition, including a link to the patent, that the NOSB can clearly determine that it is a synthetic material that does not occur in nature.

The Subcommittee discussion revolved around the points listed in the Category 3 compatibility section below. First, it is a synthetic substance that does not fit in the categories for exemptions given in OFPA [§6517(c)(1)(B)(i)]. Second, extending the storage life of a crop is not one of the criteria in OFPA [§6518(m)] that is used to evaluate materials. Lastly, there are alternative practices that can help with storage. The NOSB does not support the addition of synthetic materials to the National List in an effort to make a seasonal crop available year round.

Category 1: Classification

1. For CROP use: Is the substance Non-synthetic or Synthetic? 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.
2. Reference to appropriate OFPA category: NONE
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?

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)]

The substance is not used in the environment but in a closed room, so no potential to interact.

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)]

1-MCP competes with ethylene for the ethylene receptor sites and due to its higher affinity selectively binds to the sites. According to the petition, 1-MCP is non-toxic and non-persistent, and this is cited by a reference to TOXNET. It is a gas in the atmosphere and has a half-life of 4.4 hours.

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

A closed system is used for manufacture and the manufacturing facility meets all industry safety standards for environmental controls, recycling waste, and employee exposure.

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

1-MCP has been used for more than 15 years. There are no residues in the fruit when it reaches the consumer.

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)]

Not used in soil or environment.

6. Are there any adverse impacts on biodiversity? (§205.200)
No. Not used in environment.

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)]

There are alternatives in the broad sense, although there are no other non-synthetic or allowed synthetic materials with a similar function. A key point in the petition is that no other practices or materials work as well once the fruit has left the storage room until it is sold. For this issue there is not alternative other than rapidly getting the fruit to market.

Alternatives noted by the Crops subcommittee include:

- Crop nutritional approaches to enable apples to store longer, such as increased calcium in the fruit.
 - Excellent harvest and post-harvest handling practices such as picking at the right time for storage, timely handling to get fruit into storage, and optimal storage conditions.
 - Use of varieties that store better than others, such as Goldrush, Enterprise, Granny Smith, and numerous heirloom apples.
 - For consumers, choosing fresh organic apples from the southern hemisphere in the apple off season.
2. In balancing the responses to the criteria above, is the substance compatible with a system of sustainable agriculture? [§6518(m)(7)]

The substance is not compatible for a number of reasons. First, it is a synthetic substance that does not fit in the categories for exemptions given in OFPA [§6517(c)(1)(B)(i)]. Second, extending the storage life of a crop is not one of the criteria in OFPA [§6518(m)] that the NOSB must use to evaluate materials. Furthermore, there are alternative practices that can help apples store longer and the NOSB has been of the opinion that having a seasonal crops available year round is not a sufficient reason to add a synthetic material to the National List.

Classification Motion:

Motion to classify 1-Methylcyclopropene (1-MCP) as synthetic

Motion by: Zea Sonnabend

Seconded by: Emily Oakley

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

National List Motion:

Motion to add 1-Methylcyclopropene (1-MCP) at 205.601

Motion by: Zea Sonnabend

Seconded by: Harold Austin

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