Sunset 2018 Review Summary
Meeting 2 – Subcommittee Review
Crops Substances
November 2016

As part of the National List Sunset Review process, the NOSB has evaluated the need for the continued allowance for or prohibition of the following substances for use in organic crop production.

Reference: 7 CFR §205.601 Synthetic substances allowed for use in organic crop production.

Copper sulfate
Ozone gas
Peracetic acid
EPA List 3 - Inerts of Unknown Toxicity

Reference: 7 CFR §205.602 Nonsynthetic substances prohibited for use in organic crop production.

Calcium chloride

Copper sulfate

Reference:
205.601(a)(3) Copper sulfate—for use as an algicide in aquatic rice systems, is limited to one application per field during any 24-month period. Application rates are limited to those which do not increase baseline soil test values for copper over a timeframe agreed upon by the producer and accredited certifying agent; and,
205.601(e)(4) Copper sulfate—for use as tadpole shrimp control in aquatic rice production, is limited to one application per field during any 24-month period. Application rates are limited to levels which do not increase baseline soil test values for copper over a timeframe agreed upon by the producer and accredited certifying agent.

Technical Report: 1995 TAP (Copper Sulfate and Other Coppers); 2001 TAP; 2011 TR

Petition(s): 2001

Past NOSB Actions: 10/2001 meeting minutes and vote; 11/2007 recommendation; 04/2011 recommendation

Recent Regulatory Background: National List amended 10/31/2003 (68 FR 61987); Sunset renewal notice effective 11/03/2013 (78 FR 61154)

Sunset Date: 11/03/2018

Subcommittee Review
Copper sulfate and fixed coppers used for plant disease control (§205.601(i)(2) and §205.601(i)(3)) were recently reviewed for Sunset 2017. . The listings currently under review, are for copper used in aquatic

rice production to control algae or tadpole shrimp (§205.601(a)(3) and §205.601(e)(4), respectively). Because copper sulfate is used in aquatic systems the current annotations include specific requirements for application rates.

During the first posting, the NOSB asked for public comment on the viability of alternatives to the use of copper sulfate in rice, and whether ACAs had noticed an increase in baseline soil test values for copper in rice fields. No new information was provided about alternatives. The few ACAs who did respond did not report any concerns with increasing levels of copper in rice fields.

Until the 1990s the need for copper sulfate use in rice was unique to the California rice growing systems. Subsequently, algae, and then tadpole shrimp started to be of concern in the Missouri rice culture. Seeding rice into already flooded fields (water seeding) is what leads to the need for control of these pests. In California all rice is grown this way for a number of reasons, while in Missouri it is becoming increasingly popular. For this reason, rice research in other parts of the world is not relevant because of different growing systems, except in Australia where the rice is susceptible to snail pests.

In the California rice system, the tail water is very carefully monitored and ponds are usually used to collect tail water and allow settling to occur before the water is released back into the canals. This, combined with the current practice of leaving rice straw in the fields from the previous crop, very much stops any copper from being released into the surrounding ecosystem since it binds quickly to the soil sediment and the rice straw.

Annual reports from the California Rice Research Board were consulted from as far back as 2006 (http://www.carrb.com/) in preparing this review because they research all possible alternatives as they emerge for both the scum algae and the tadpole shrimp. They studied several microbial products, zinc sulfate, using barley straw, and withholding phosphorus fertilizer as techniques during that time. The zinc sulfate was somewhat promising but had to be used at about 5 times the rate of copper sulfate and the synthetic zinc may be similarly toxic as copper so no further research could be found. The microbial products and barley straw were not effective. Withholding phosphorus worked with synthetic chemical phosphorus somewhat, but not enough to pursue more research since 2010.

The reports from the CA Rice Research Board and from Cooperative Extension in Colusa County (http://cecolusa.ucanr.edu/newsletters/Rice_Briefs_Newsletter34775.pdf) indicate that tadpole shrimp are becoming an increasing problem in recent years. The hypothesis is that more operations are incorporating rice straw into the fields rather than removing it or burning it as was done in the past. This creates the conditions for tadpole shrimp eggs, which can lay dormant for up to 10 years before hatching. . These conditions include warm temperatures in between the seeding of the rice and its emergence from the water (about a 6 to 12 day period).

Since 2012, the NOSB has included in its research priorities document, a request for research into alternatives to copper sulfate. It will remain a priority with the hope that more promising alternatives may arise in the future. Public comment strongly supported the need for such research.

Motion to Remove

The Subcommittee proposes removal of copper sulfate from the National List based on the following criteria in the Organic Foods Production Act (OFPA) and/or 7 CFR 205.600(b) if applicable: availability of alternatives.

Vote in Subcommittee

Motion by: Zea Sonnabend
Seconded by: Harriet Behar
Yes: 0 No: 7 Abstain: 0 Absent: 0 Recuse: 0

Ozone gas

Reference: 205.601(a)(5) Ozone gas—for use as an irrigation system cleaner only.

Technical Report: 2002 TAP

Petition(s): 2001

Past NOSB Actions: 09/2002 meeting minutes and vote; 11/2007 recommendation; 12/2011 recommendation

Recent Regulatory Background: National List amended 10/31/2003 (68 FR 61987); Sunset renewal notice effective 11/03/2013 (78 FR 61154)

Sunset Date: 11/03/2018

Subcommittee Review

Ozone is a strong oxidant and works by oxidizing plant tissue and bacterial membranes. Originally, ozone was petitioned for use for weed control in crop production. It was suggested that ozone be injected through irrigation drip tape under plastic mulch. A subsequent additional request was made for use of ozone as an antimicrobial agent to clean irrigation lines.

In the 2002 TAP review, one reviewer objected strongly to use of "a known and problematic air pollutant" in organic farming. Two reviewers felt that ozone should be permitted with restrictions.

Ozone was not approved for use in weed control, but was listed for use as an irrigation system cleaner in November 2003. Used as an irrigation cleaner, ozone is much less likely to be released into the atmosphere. Used for weed control, ozone could escape into the atmosphere. At sunset in November 2007 ozone was recommended for relisting by a vote of 14 to 0. At sunset in December 2011 ozone was recommended for relisting by a vote of 13 to 0.

For the first round of public comments, the Crops Subcommittee asked for information on the scope of use of ozone in irrigation system cleaning. Comments from producers and organizations that work with organic producers indicated that there is quite a bit of use of ozone for irrigation system cleaning. One producer indicated that ozone is the least expensive option for irrigation cleaning. Others said they preferred ozone because its breakdown product is oxygen, leaving no toxic residues in the environment.

Some organizations commented that a technical review is needed to learn if ozone could pose a hazard for workers or the environment, or if there are better alternatives.

The Crops Subcommittee supports relisting of ozone as an irrigation system cleaner.

Motion to Remove

The Subcommittee proposes removal of ozone from the National List based on the following criteria in the Organic Foods Production Act (OFPA) and/or 7 CFR 205.600(b) if applicable: None.

Vote in Subcommittee

Motion by: Francis Thicke
Seconded by: Harold Austin
Yes: 0 No: 4 Abstain: 1 Absent: 2 Recuse: 0

Peracetic acid

Reference:
205.601(a)(6) Peracetic acid—for use in disinfecting equipment, seed, and asexually propagated planting material. Also permitted in hydrogen peroxide formulations as allowed in §205.601(a) at concentration of no more than 6% as indicated on the pesticide product label; and,
205.601(i)(8) Peracetic acid - for use to control fire blight bacteria. Also permitted in hydrogen peroxide formulations as allowed in §205.601(i) at concentration of no more than 6% as indicated on the pesticide product label.

Technical Report: 2000 TAP

Petition(s): 2008

Past NOSB Actions: 11/2007 recommendation; 11/2009 annotation change; 12/2011 sunset recommendation

Recent Regulatory Background: National List amended 10/31/2003 (68 FR 61987); Sunset Review 10/09/2008 73 FR 59479 ; Annotation change 05/28/2013 (78 FR 31815)

Sunset Date: 5/29/2018

Subcommittee Review

Specific Uses of the Substance: In organic crop production, peracetic acid is used to disinfect equipment. It can also be used as a disinfectant to treat seeds or asexually propagated planting material. It can be used to disinfect pruning equipment to help prevent the spread of the fire blight bacterium and is also used in one of the hydrogen peroxide formulations for control on the tree canopy of this same disease. Peracetic acid is also used in formulations of hydrogen peroxide, allowed at a concentration of no more that 6%, for use in organic crop production. Peracetic acid was relisted during the 2016 Sunset review for Handling and the 2017 Sunset listing for Livestock.

Peracetic acid is an unstable oxidizing agent, which is what makes it such an effective sanitizer. According to the 2016 TR, solutions of peracetic acid, hydrogen peroxide, acetic acid and water are produced by reacting glacial acetic acid with hydrogen peroxide, frequently in the presence of a catalyst such as a mineral acid (e.g., sulfuric acid). Most commercially available peracetic acid solutions contain a synthetic stabilizer and chelating agent such as HEDP (1-hydroxyethylidene-1, 1-diphosphonic acid) or dipicolinic acid (2, 6-dicarboxypyridine) to slow the rate of oxidation or decomposition.

International uses:

- **Canada** – permits the use of peracetic (peroxyacetic) acid at paragraph 4.3 (Crop Production Aids and Materials) with the following annotation: "Permitted for: a) controlling fire blight bacteria; and b) disinfecting seed and asexually propagated planting material". This allowance is consistent with NOP regulations.
- **European Economic Community (EEC) Council Regulation, EC No. 834/2007 and 889/2008** - Peracetic acid is not listed in Annex II – Pesticides – plant protection products. Nonetheless, as of June 1, 2012, the European Union and the United States have an equivalency agreement whereby organic products certified to the USDA or European Union (EU) organic standards may be sold and labeled as organic in both the U.S.A. and the EU.
- **Codex** - Not listed.
- **Japan** - Not listed in the Japanese Agricultural Standard for Organic Production. However, the United States entered into an equivalency agreement with Japan, effective on January 1, 2104. The scope of the arrangement is limited to plants and plant-based products which undergo final processing, packaging, or labeling within the boundaries of those two countries.
- **IFOAM** - The IFOAM norms permit the use of peracetic acid for cleaning equipment and/or disinfecting equipment with no final rinse (IFOAM Appendix 4, Table 2), for pest and disease control, and for disinfection of livestock housing and equipment (IFOAM Appendix 5).

Technical Report: The Crops Subcommittee received a new Technical Evaluation Report on March 3, 2016. This was not received by the Subcommittee in time to submit a proposal for the Spring 2016 meeting. New TRs were also provided to both the Livestock and Handling Subcommittees, to provide consistency and also from a cost management perspective as well, even though peracetic acid is not currently under review in either of those subcommittees. Peracetic acid was relisted during the 2016 Sunset review for Handling and the 2017 Sunset listing for Livestock.

Discussion: Peracetic acid appears to be a straightforward material in that it is made from, and decomposes back to, acetic acid, oxygen, and water. Peracetic acid is a very strong oxidizing agent. First developed in 1950, it has historically been used to treat fruits and vegetables to reduce spoilage from bacteria and various fungi. It is used to treat bulbs, to disinfect potting soil, clean irrigation equipment, and in seed treatment to inactivate fungi or other plants diseases. Additionally, in organic crop production it is also used as a bactericide/fungicide in wash waters to help decrease *Escherichia coli O157:H7* on some fruit and vegetable crops. With the recent removal of two antibiotics previously allowed for use in organic crop production to assist in fire blight reduction, use of this substance as part of a rotational control and fire blight prevention program has increased, according to information provided by some organic stakeholders during recent public comment periods.

In the December 2, 2011, NOSB recommendation for the 2013 Sunset review of peracetic acid for the two Crops listings at §205.601(a)(6) and §205.601(i)(8), the Board clarified the annotation change from the 2009 recommendation and supported it. The original recommended annotation change was:

> §205.601(a)(6) Peracetic acid—for use in disinfecting equipment, seed, and asexually propagated planting material. Permitted in hydrogen peroxide formulations at concentration of

no more than 5%.

§205.601(i)(8) Peracetic acid—for use to control fire blight bacteria. Permitted in hydrogen peroxide formulations at concentrations of no more than 5%.

This annotation was later implemented by the NOP with a slight change. The recommended 5 percent limit was changed to a 6 percent limit, based on information provided during public comment stating the recommended 5 percent limit was too low compared to percentages in use at the time. This point of concern was discussed at the Spring NOSB meeting and it was decided that this slight increase in the percentages was necessary to adequately accommodate use rates in comments provided in public comments during the last sunset review cycle and no further action was needed by the NOSB on this at this time.

While there do appear to be other materials that could be used as a possible alternative to peracetic acid, this material is selected for use by many organic crop producers for many reasons: It is a strong oxidizing compound, works well in colder conditions, does not give off chlorine into the environment, used as part of a rotation process in fire blight disease control, and is the more benign of the sanitizers and disinfectants, since it reverts back to acetic acid, oxygen, and water in the environment. This is according to information provided during public comment and also contained in information found in the latest TR.

Concerns were raised during public comment submitted for the Spring NOSB meeting regarding the various forms of peracetic acid mentioned in the TR. This was discussed during the meeting and determined that the majority of those other sources (that were raising a concern) would not be allowed for use in organic crop production or other currently allowed uses, as currently shown on the National List. Several commenters also mentioned that they felt that all sanitizers and disinfectants should be looked at for a determination of need and prioritization of allowed uses. It was determined that request was outside of the scope of this specific Sunset Review and would need to be addressed as a separate issue/topic.

Other public comment mentioned that the implementation of the Food Safety Modernization Act (FSMA), to oversee an enhanced approach to food safety both at the farm and at the handling levels, places an even higher degree of necessity in having this material and/or other sanitizers available for use in organic crop production.

There was overwhelming support for the continued (relisting) of peracetic acid for use in organic crop production. While a few commenters took a neutral position, there were no commenters either during the written or oral public comment periods that were specifically opposed to the relisting of peracetic acid.

Based on the information provided (comments, new TR, etc.), discussion during public comment periods (in-person, webinar, and written), and Subcommittee review and discussion: it was determined this material satisfies the OFPA Evaluation criteria and the Crops Subcommittee supports the relisting of peracetic acid.

Motion to Remove

The Subcommittee proposes removal of peracetic acid from the National List based on the following criteria in the Organic Foods Production Act (OFPA) and/or 7 CFR 205.600(b) if applicable: None.

Vote in Subcommittee

Motion by: Harold V. Austin IV

Seconded by: Emily Oakley

Yes: 0 No: 5 Abstain: 0 Absent: 2 Recuse: 0

EPA List 3 - Inerts of Unknown Toxicity

Reference: 205.601(m)(2) EPA List 3—Inerts of unknown toxicity—for use only in passive pheromone dispensers.

Technical Report: N/A

Petition(s): NA

Past NOSB Actions: 10/2002 meeting minutes and vote (see pheromones); 11/2007 recommendation; 05/2012 recommendation; 08/2015 recommendation to change annotation at 7 CFR 205.601(m)

Recent Regulatory Background: National List amended 10/31/2003 (68 FR 61987); Sunset Review 10/09/2008 73 FR 59479 Sunset Review 10/03/13 (78 FR 61154)

Sunset Date: 11/03/2018

This listing will be superseded by the annotation change approved by the NOSB for EPA List 4 and List inerts (§205.601(m)(1)). The NOSB is continuing the sunset review process for these EPA List 3 inerts in case that change cannot be implemented through rulemaking before the 11/03/2018 sunset of EPA List 3 inerts.

Subcommittee Review

The Crops Subcommittee supports moving the separate listing for this category into the changed annotation that will cover all inert ingredients, with the ones in pheromone twist ties mentioned as a subheading of inerts. We feel that these materials are an essential component of passive dispensers and have a history of use in organic farming which has reduced the use of many other pest control products. We have seen no new information that would cause us to question their safety to human health or the environment.

Additional information requested by NOSB:

None

Motion to Remove

The Subcommittee proposes removal of EPA List 3 - Inerts of unknown toxicity - for use only in passive pheromone dispensers, from the National List based on the following criteria in the Organic Foods Production Act (OFPA) and/or 7 CFR 205.600(b) if applicable: none

Vote in Subcommittee

Motion by: Zea Sonnabend

Seconded by: Harold Austin

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

Calcium chloride

Reference: 205.602 - Nonsynthetic substances prohibited for use in organic crop production.

(c) Calcium chloride, brine process is natural and prohibited for use except as a foliar spray to treat a physiological disorder associated with calcium uptake.

Technical Report: 2007 TAP

Petition(s): 2005; 2015

Past NOSB Actions: 09/1996 minutes and vote; 11/2006 annotation change (failed); 11/2007 sunset recommendation; 12/2011 sunset recommendation

Recent Regulatory Background: National List amended 10/31/2003 (68 FR 61987); Sunset renewal notice effective 11/03/13 (78 FR 61154)

Sunset Date: 11/03/2018

Subcommittee Review

The NOSB originally voted to allow calcium chloride for use to control bitter pit in apples and as an emergency defoliant for cotton; the material was categorized as non-synthetic and was not included on §205.601 or §205.602. Calcium chloride was subsequently petitioned and added to National List §205.602 as a non-synthetic substance prohibited for use in organic crop production. The annotation states: “brine process is natural and prohibited for use except as a foliar spray to treat a physiological disorder associated with calcium uptake.” Calcium chloride is commonly used in organic production; there are currently 20 registered OMRI products and 10 WSDA registered products.

This material has historically not been allowed for direct soil applications due to high chloride and high solubility concerns. The Board received petitions in both 2005 and 2015 requesting removal of the prohibition. The 2005 petition was declined by the Board for failing all three OFPA criteria. The 2015 petition contested these concerns and argued the contrary; however, no new substantive information was presented to warrant reconsideration of the petition. Because natural substitutes like limestone, gypsum, rock phosphate, and bone meal are unable to supply calcium in sufficient quantities when faced with limited calcium uptake conditions, targeted foliar sprays are appropriate.

The NOSB did not ask any questions of the public during the first posting, however, written public

comment supported the relisting of calcium chloride. The Subcommittee has no concerns regarding the continued listing of calcium chloride at §205.602.

Motion to Remove

The Subcommittee proposes removal of calcium chloride from the National List based on the following criteria in the Organic Foods Production Act (OFPA) and/or 7 CFR 205.600(b) if applicable: none.

Vote in Subcommittee

Motion by: Carmela Beck
Seconded by: Harold Austin
Yes: 0 No: 7 Abstain: 0 Absent: 0 Recuse: 0