



Comments to the National Organic Standards Board

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CORNUCOPIA
INSTITUTE

The Cornucopia Institute is engaged in research and educational activities supporting the ecological principles and economic wisdom underlying sustainable and organic agriculture. Through research and investigations on agricultural and food issues, The Cornucopia Institute provides needed information to family farmers, consumers, the media and other stakeholders in the good food movement.

The Cornucopia Institute wishes to thank the thousands of family-scale farmers and their urban allies who fund our work with their generous donations.

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INTRODUCTION

The Cornucopia Institute is pleased to offer the National Organic Standards Board our formal analysis of, and recommendations on, a limited and focused set of issues and materials up for review at the Spring 2017 meeting.

Cornucopia adamantly believes that a thorough and appropriate review process needs to take place for all petitioned materials, and that all materials should conform with the Organic Foods Production Act of 1990 (OFPA) and the federal organic standards. We hope that the Board will benefit from Cornucopia's independent perspective in these comments.

The Cornucopia Institute is a 501(c)(3) public interest farm and food policy research organization. Cornucopia engages in educational activities supporting the ecological principles and economic wisdom underlying sustainable and organic agriculture.

Through research and investigations on agricultural and food issues, The Cornucopia Institute provides educational information to farmers, consumers, the media, and other stakeholders involved in the good food movement.

We are proud to represent thousands of supporting members from across the country, including many of the nation's certified organic farmers.

We do not sell materials seeking approval for Sunset reauthorization, and we do not sell organic products that utilize any substances that might be petitioned.

We have no financial interest in the approval of any of the materials proposed for use in organic foods.

These formal comments follow in the order of the Spring 2017 Tentative Agenda released by the USDA National Organic Program.

HANDLING SUBCOMMITTEE

PROPOSAL

Tocopherols–Annotation Change at 205.605(b) and deferred proposed additional listing at §205.605(a)

SUMMARY

The Handling Subcommittee proposes an annotation change for Tocopherols:

- Motion to change the annotation for tocopherols listed at §205.605(b) of the National List: "Derived from vegetable oil when rosemary extracts are not a suitable alternative" to the following annotation: "Derived from plant oils. Non-synthetic or organic tocopherols are to be used when commercially available."

The Cornucopia Institute recommends the removal of this substance from §205.605(b) and a new listing on §205.605(a). However, since the removal from §205.605(b) is not on the agenda, we recommend the **following modification to the proposed annotation and strongly recommend the addition of an expiration date** on this listing to incentivize the increase in the commercial availability of natural and organic tocopherols:

- §205.605(b) **Tocopherols–derived from GMO-free plant oils and extracted without synthetic solvents. Non-synthetic or organic tocopherols are to be used when commercially available.**

In addition, the subcommittee is deferring the proposal for a new listing at §205.605(a) "to the fall 2017 meeting so that comments to this proposal can be assessed before finalizing."

The Cornucopia Institutes **supports** the new listing at 205.605(a) and, based on the comments collected during the Fall 2016 NOSB public comment period, we suggest a potential wording:

- 205.605(a), **Tocopherols – derived from GMO-free plant oils and extracted without synthetic solvents. Organic tocopherols are to be used when commercially available.**

The Cornucopia Institute agrees with the inclusion of tocopherols obtained from other natural sources, such as nuts and seed oils, as this broadens the availability of non-synthetic and organic tocopherols. Currently, most, if not all nonorganic tocopherols, suitable for the proposed annotations of either listing, are extracted from a number of

nonorganic vegetable oils, but mainly from soybean oil.[1] The majority (94%) of soybeans grown in the USA are GMO.[2]

Rationale:

- **In the spring of 2014, The Livestock Subcommittee received a letter from Oh Oh Organics supporting the consistent availability of natural tocopherols extracted without synthetic solvents.**
- **Several additional testimonies made to the NOSB at the spring and fall 2015 meetings clearly establish that a sufficient commercial supply of non-solvent extracted natural tocopherols appears to exist.**
- Tocopherols are extracted from oil distillate, resulting from the deodorization of vegetable oils via several steps, which can include extraction with volatile organic solvents.
- Hexane is a solvent commonly used to extract tocopherols from soybean oil. Other solvents may include ethanol, isopropanol alcohol, acetone, isopentatne, isohexane, trichloroethylene, or petroleum ether.
- Solvent extraction is a prohibited method in organic production.
- Non-solvent extracted tocopherols from non-GMO oil are currently commercially available.
- The main sources of tocopherols are conventionally grown oils, such as soybean, rapeseed (canola), sunflower, corn, and cottonseed oils. In reviewing the impact of their manufacture, the NOSB must consider the consequences of raising the nonorganic crops used to produce it, including GMO crops.

DISCUSSION

Tocopherols are a group of fat-soluble phenolic antioxidants naturally occurring in a variety of plant species, encompassing cereal grains, oilseeds, nuts, and vegetables.[3] Tocopherols possess vitamin E activity, and are an antioxidant ingredient mainly used for the stabilization of food products containing fats or oils susceptible to oxidation damages, resulting in off-flavor (rancidity). Their action helps preserve the taste and nutritional value of the food. They are used as additives in a variety of food, including dairy products, cereals, frozen green vegetables, margarine, fresh and frozen sausages, vegetable oils, soft drinks, snacks and nuts, salad dressings, soup bases, seasonings, dehydrated potatoes, processed meats and poultry, and baked products.[4]

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[1] https://www3.epa.gov/ttnchie1/ap42/ch09/final/c9s11-1.pdf

[2] http://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us/recent-trends-in-ge-adoption.aspx

[3] Burdock, G.A. 1997. Tocopherols. In: Encyclopedia of Food and Color Additives, Volume III. CRC Press, Boca Raton, FL, pp. 2801-2803.

[4] Limited Scope TR, 2015 - Tocopherols. Page 4, line 109-115

Human Health Concerns

Tocopherols used as antioxidants in food are generally obtained from oil distillate, a deodorization by-product of vegetable oils[5] through a series of extraction and refining steps, which can include **solvent extraction, chemical treatment, crystallization, complexation, and vacuum or molecular distillation**.[6]

Soybean oil is often a source of mixed tocopherols, which are obtained by solvent extraction, most commonly **hexane**. Other solvents may include ethanol, isopropanol, acetone, isopentane, isohexane, trichloroethylene, or petroleum ether.[7] **A 2009 study by The Cornucopia Institute found hexane residues in soybean oil.[8] Hexane is a neurotoxic petrochemical solvent**, listed as a hazardous air pollutant by the EPA, and is "*harmful or fatal if swallowed*" according to the MSDS.[9]

Considering the toxicity of hexane, and the fact that extraction using volatile solvents is a prohibited method under the organic regulations, it would be wise to ensure that **only natural tocopherols, obtained without solvents,** are used as antioxidants in processed foods to prevent long-term chronic exposure to hexane.

Alternatives & Essentiality

Comments about commercial availability: In 2014 there were already **several sources of non-solvent extracted natural tocopherols**. This was pointed out in the minority report on the tocopherols proposal for aquaculture, which was deliberated at the spring 2014 NOSB meeting:

> "The minority also has concerns about the unnecessary presence of volatile synthetic solvents in tocopherols. The Livestock Subcommittee received a letter from Oh Oh Organics supporting the consistent availability of natural tocopherols extracted without synthetic solvents. The letter states, "*I have sold **Non-GMO, non-solvent extracted tocopherol since 2005**. Both BASF, an international ingredient manufacturer out of Germany and BTSA, a company specializing in non-GMO Tocopherols supply this material. It is consistently available and is broadly used in the food, cosmetic and household cleaning business. Additionally I have seen ISO certified documents for a supplier in China...so, I believe it is available around the world*."

In spite of this and several additional testimonies made to the NOSB at the spring and fall 2015 meetings, the NOSB chose to dismiss this evidence, which seems to clearly establish that a sufficient commercial supply of non-solvent extracted natural tocopherols exists.

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[5] Burdock, G.A. 1997. Tocopherols. In: Encyclopedia of Food and Color Additives, Volume III. CRC Press, Boca Raton, FL, pp. 2801-2803

[6] Limited Scope TR, 2015 - Tocopherols. Page 4, line 87-89

[7] Limited Scope TR, 2015 - Tocopherols. Page 8, line 308-313

[8] http://www.cornucopia.org/2009/05/soy-report-and-scorecard/

[9] Registry, A., & Health, N. (2013). Public Health Statement for n-Hexane. Retrieved from http://www.eoearth.org/view/article/51cbeebe7896bb431f699f7a

Instead, the NOSB stated:

> "*The NOSB completed review of tocopherols as part of its 2017 Sunset review and voted at the Fall 2015 meeting in Stowe, Vermont, to retain the listing on the National List at §205.605(b). However, during the initial public comment period,* ***several commenters asserted that non-synthetic tocopherols are commercially available and should be used instead of synthetic versions****. In the final Sunset proposal for tocopherols, the Handling Subcommittee indicated that it was considering a proposal to reclassify tocopherols to §205.605(a) and was seeking input regarding the impact of that on the industry.* ***The second round of public comments brought forth several objections to a reclassification of tocopherols, citing their importance in food safety and voicing concerns regarding commercial availability of nonsynthetic versions.*** *The Handling Subcommittee strongly encourages industry to move to non-synthetic, organic versions of tocopherols but does recognize that at present, there is insufficient commercial availability of organic tocopherols. For that reason, we are proposing a duplicate listing at 205.605(a) so that those manufacturers who wish to move to non-synthetic tocopherols – while waiting on commercial availability of organic versions – are incentivized to do so*."

While the use of organic tocopherols is the most desirable outcome, the use of non-solvent extracted natural tocopherols derived from GMO-free plant oils would be acceptable during a transitional period, until organic tocopherols become commercially available at a sufficient scale.

Other Considerations

Many of the oils from which tocopherols are extracted are obtained from GMO crops, including canola, soy, corn, and cottonseed. When reviewing this material, the NOSB must consider whether the manufacturing base was obtained from excluded methods.

The main sources of tocopherols are conventionally grown oils. In reviewing the impact of their manufacture, the NOSB must consider the consequences of chemical-intensive agriculture in the production of nonorganic crops used to produce these oils.

Tocopherols are commonly formulated with ancillary substances;[10] only handling materials listed on the National List, and additionally not obtained via excluded methods, should be used in tocopherol formulations.

CONCLUSION

The Cornucopia Institute requests the removal of tocopherols at §205.605(b). Given that is not on the agenda, we suggest an annotation modification to state: **Tocopherols –**

[10] Limited Scope TR, 2015 -Tocopherols. Pages 5-6, line 175-191

extracted without synthetic solvents and derived only from GMO-free plant oils. Non-synthetic or organic tocopherols are to be used when commercially available.

In addition, The Cornucopia Institute supports the listing of tocopherols under **§205.605(a)** *Non-synthetics allowed,* **Tocopherols – extracted without synthetic solvents and derived only from GMO-free plant oils. Organic tocopherols are to be used when commercially available.**

Furthermore, the NOSB should encourage the production and availability of organic tocopherols by placing an expiration date on the §205.605(a) and §205.605(b) listings.

DISCUSSION DOCUMENT

Bisphenol A (BPA) in Packaging

SUMMARY

The Cornucopia Institute **opposes the use of Bisphenol A (BPA)** in the packaging of any product labeled ''organic'' or ''made with organic (specified ingredients or food group(s))" because **numerous peer-reviewed studies show that BPA is an endocrine-disrupting chemical and is linked to a multitude of adverse health effects, including cancer, obesity, diabetes, neurological and behavioral problems, and reproductive issues.**

We are encouraged by the Handling Subcommittee's request for information, including whether BPA should be prohibited, and have submitted the following comments to directly respond to the Handling Subcommittee's request.

Rationale:

- **7 C.F.R. § 205.272(b)(2)** prohibits the use of any substance which "compromises the organic integrity" of any product labeled as "organic" or "made with organic (specified ingredients or food groups(s))." BPA "compromises the organic integrity" in the handling and packaging of food products in violation of 7 C.F.R. § 205.272(b)(2) because of the myriad of serious adverse health effects which are linked to exposure to BPA. The use of a chemical linked to such well-documented adverse health effects is entirely inconsistent with the basic tenants of organic agriculture, which include promoting the health of individuals through access to high-quality, nutritious food that contributes to preventive health care and well-being.

  Section 205.272(b) provides:

Commingling and contact with prohibited substance prevention practice standard.

(b) The following are prohibited for use in the handling of any organically produced agricultural product or ingredient labeled in accordance with subpart D of this part:

(1) Packaging materials, and storage containers, or bins that contain a synthetic fungicide, preservative, or fumigant;

(2) **The use** or reuse **of any bag or container that has been in contact with any substance in such a manner as to compromise the organic integrity of any organically produced product or ingredient placed in those**

containers, **unless** such reusable bag or **container** has been thoroughly cleaned and **poses no risk of contact** to the organically produced product, or ingredient, with the substance used.

7 C.F.R. § 205.272 (emphasis added)

- It is undisputed that dietary exposure to food products packaged in BPA-lined cans results in higher urinary BPA concentrations in humans. In a recent study analyzing the urine of thousands of people of various ages and backgrounds, researchers learned that the consumption of just one BPA-lined canned food product was associated with a 24% higher BPA urinary concentration.[11]
- Even at low doses, BPA has long been suspected, but has recently been shown to act directly on fetal mammary glands, thereby increasing the propensity to develop cancer in adult life.[12]
- BPA accumulates in reproductive organs, and due to its structural similarity to estrogen, acts as an endocrine disruptor. BPA impairs the structure and functions of the female reproductive system, affecting puberty, ovulation, and is linked to female infertility.[13]
- Exposure to low-dose BPA has been linked to disruption of the cell duplication cycle, which is related to the development of prostate cancer. Recent research shows that higher levels of BPA are found in prostate cancer patients than non-prostate cancer patients.[14]
- Research shows that BPA is associated with the development of Type 2 diabetes, independent of factors such as age, gender, race/ethnicity, body mass index, and serum cholesterol levels.[15]
- The human placenta does not act as a barrier to BPA, which makes fetuses and children especially vulnerable to its toxic effects. BPA exposure during the gestational period is linked to neurological disorders and impaired behavioral development. Exposure during gestation to BPA is associated with hyperactivity, aggression, anxiety, cognitive deficits, and learning-memory impairment in children.[16]

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[11]Hartle J, Navas-Acien A, Lawrence R (2016) "The Consumption of Canned Food and Beverages and Urinary Bispenol A Concentrations in NHANES 2003-2008." *Environmental Research*, Vol. 150, pp. 375-382

[12] Speroni L, Voutilainen M, Mikkola M, Klager S, Schaeberle C, Sonnenschein C, Soto A (2017) "New Insights into Fetal Mammary Gland Morphogenesis: Differential Effects of Natural and Environmental Estrogens." *Scientific Reports*, Article No. 40806 (The new organ culture system developed by researchers at Tufts University Medical School showed direct effects of BPA on developing mouse fetal tissue.)

[13] Xiaona H, Chen D, Yonghua H, Wenting Z, Wei Z, Zhang J. (2015) Bisphenol-A and Female Infertility: A Possible Role of Gene-Environment Interactions. *Int. J Environ Research & Public Health*, 12(9): 11101-11116

[14] Tarapore P, Ying J, Ouyang V, Burke B, Bracke B, Ho S, (2014) Exposure to Bisphenol A Correlates with Early-onset Prostate Cancer and Promotes Centrosome Amplification and Anchorage-Independent Growth *In Vitro. PLOS One,* available at: http://dx.doi.org/10.1371/journal.pone.0090332

[15] Shankar A, Teppala S (2011) Relationship between Urinary Bisphenol A Levels and Diabetes Mellitus. *Journal of Clinical Endocrinology Metabolism*, 96(12): 3822-2836

[16] Inadera H (2015) Effects of Bisphenol A and its Analogues. *International Journal of Medical Sciences*, 12(12): 926-936

- Other countries have recognized the hazards of BPA used in food packaging. **France prohibits the import and domestic sale of any food contact materials containing BPA**. Canada, the European Union, and the United States ban the use of BPA in infant formula bottles, a clear acknowledgement that adverse health effects tied to dietary exposure to BPA exist.
- The Food and Drug Administration's June 2014 Report, in which it concluded "an adequate margin of safety exists for BPA at current levels of exposure from food contact uses," contravenes overwhelming evidence that cumulative exposure to BPA disrupts hormones in a manner that harms human health.[17]
- Over 90% of studies that have no industry funding have concluded that BPA has harmful effects on health. It is industry-funded studies, such as those funded by the plastics and chemical industries which have a financial stake in the chemical's continued use, that have concluded BPA has no harmful effects on human health.[18]
- **The positions taken by the FDA have been influenced by aggressive lobbying and industry-funded reports about BPA—by law, the NOSB needs to take a more critical approach.** The NOSB should practice the *precautionary principle* — there is ample reason to err on the side of caution.

DISCUSSION

Peer-reviewed scientific research shows that BPA is linked to a multitude of adverse health conditions. A basic principle of organic agriculture is one of health, whether it be in promoting health in farming, processing, distribution, or consumption. The use of BPA, given its linkage to a host of serious adverse health conditions, contravenes the basic principle of health, which is a founding tenant on which organic agriculture has long been based. The organic regulations addressing the preventive practice standard, particularly 7 C.F.R. § 205.272(b)(2), embrace the principle of health in prohibiting the use of containers that compromise organic integrity. BPA's link to serious adverse health effects compromises the "organic integrity" of "organically produced products," rendering BPA's use in the packaging of organic products a violation of the clear intent of the regulatory language.

CONCLUSION

The Cornucopia Institute **opposes** the use of BPA in the packaging of organic products because of the harm to human health. It is incumbent upon the NOSB to err on the side of caution, operating under the *Precautionary Principle*, and prohibit BPA from use in the packaging of organic foods.

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[17] https://www.fda.gov/Food/IngredientsPackagingLabeling/FoodAdditivesIngredients/ucm166145.htm

[18] Main D (March 4, 2015) BPA is Fine, if You Ignore Most Studies About It. *Newsweek*, available: http://www.newsweek.com/2015/03/13/bpa-fine-if-you-ignore-most-studies-about-it-311203.html *citing* Sall F, Welshons W (2006) Large Effects from Small Exposures: The Importance of Positive Controls in Low-dose Research on Bisphenol A. *Environmental Research* 100(1): 50-76

LIVESTOCK SUBCOMMITTEE

2019 SUNSET SUBSTANCES

Procaine

SUMMARY

The Cornucopia Institute **does not support the relisting** of procaine on the National List under §205.603 synthetic substances allowed for use in organic livestock production.

Rationale:

- Procaine is used as a local anesthetic, but is not as effective as lidocaine.
- Procaine is not widely available, except in combination with the antibiotic penicillin, which is not allowed for use in organic livestock production.
- There is no benefit to using procaine vs. lidocaine, so having it on the National List likely only creates confusion.

DISCUSSION

The synthetic drug procaine was first approved for use in organic livestock production in 1995. However, it is unclear as to why it is on the National List, as it serves the same function for use as a local anesthetic as the much more widely used and more effective drug, lidocaine. In fact, because lidocaine is so widely used, accepted in veterinary medicine, and offers advantages in its effectiveness, procaine is not readily available as a local anesthetic. However, it is available in a combination medicine with the antibiotic penicillin, which could be problematic if an organic livestock producer mistakenly uses this combination, believing it to be on the National List.

In light of these revelations, keeping procaine on the National List, when lidocaine is a better alternative, simply creates unnecessary confusion and uncertainty. A livestock producer might waste precious time trying to figure out which drug to use when the choice to use lidocaine, for local anesthesia, should be clear.

CONCLUSION

The local, synthetic anesthetic procaine offers no advantages as an alternative to lidocaine for organic producers. Since lidocaine is equally as safe to use as procaine, for the sake of clarity, simplicity, and effectiveness, the Cornucopia Institute recommends removing procaine from the National List.

Lidocaine

SUMMARY

The Cornucopia Institute **supports the relisting** of lidocaine on the National List under §205.603 synthetic substances allowed for use in organic livestock production.

Rationale:

- Lidocaine is a relatively safe, effective, widely available, local anesthetic used to reduce pain in an animal during veterinary surgical procedures or during dehorning.
- Potential toxicity is minimal when used appropriately.
- Safe and effective non-synthetic alternatives are not available.

DISCUSSION

The synthetic drug 2% lidocaine hydrochloride was first approved for use in organic livestock production in 1995. Lidocaine has become the most commonly used local anesthetic in veterinary medicine in the U.S.,[19] and has been in commercial use since 1949 as the only anesthetic approved for cattle by the FDA.[20] It is also considered the most effective local anesthetic, as it is short-acting and longer-lasting than other commonly available local anesthetics, such as procaine.[21]

Lidocaine hydrochloride is a water-soluble injectable drug, which acts quickly to numb an injection site to reduce the feeling of pain. It is regularly used for reducing pain during surgery or dehorning, for treating painful wounds, or as an epidural. While the local, synthetic anesthetic procaine can also be used, its action is slower to take effect, it does not last as long, and it is not widely available. Thus, it offers no advantages as an alternative to lidocaine for organic producers.

In a 2016 survey The Cornucopia Institute conducted with certified organic livestock producers (excluding poultry), 10 out of 28 farmers responded that they used the 2% lidocaine hydrochloride on one of their animals for pain relief. This demonstrates that it is a commonly used drug.

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[19] https://instruction.cvhs.okstate.edu/.../pdf/14LocalAnesthesia2006b.pdf

[20] Geof Smith, DVM, MS, PhD, "Extralabel Use of Anesthetic and Analgesic Compounds in Cattle" Vet Clin Food Anim 29 (2013) 29–45 http://dx.doi.org/10.1016/j.cvfa.2012.11.003

[21] Opinion of the Scientific Committee of the Norwegian Scientific Committee for Food Safety 10 June 2005: Risk assessment of lidocaine residues in food products from cattle, swine, sheep and goats: withdrawal periods for meat and milk. www.vkm.no/dav/8b9b95e522.pdf

In human medicine, use of lidocaine is even more widespread, as it is used as an injectable local anesthetic during surgery or dental procedures, and used in a wide variety of over-the-counter medications, such as wound sprays, liniments, sunburn treatments, and teething gels.

While it is possible to overdose, when lidocaine is used as directed, it is considered safe and non-addictive. It is not a drug that is in demand for illicit use. For livestock use, 2% lidocaine hydrochloride is only available from a licensed veterinarian, or under the direct supervision of a licensed veterinarian.

Withholding Interval

At the April 2016 NOSB meeting, a proposal to reduce the withholding period for lidocaine from 90 days to a period of 6 days for milk, and 8 days for slaughter stock, was unanimously approved. The Cornucopia Institute supports that change.

One recent study suggested that the main metabolite of lidocaine, 2,6-xylidine, which is a known carcinogen, may have a slightly longer residual period than lidocaine in the meat and milk of cattle. While this does raise some concern, the amount of 2,6-xylidine residue was minimal after several days, and studies do not show the compound is carcinogenic at low levels.[22] Perhaps this will warrant further investigation as future research on the subject becomes available.

CONCLUSION

Lidocaine is a widely used, readily available, relatively safe, local anesthetic with no better alternatives. The Cornucopia Institute **supports relisting** of this important drug.

[22] Committee for Medicinal Products for Veterinary Use (CVMP). 2015. CVMP assessment report regarding the request for an opinion under Article 30(3) of Regulation (EC) No 726/2004 In relation to the potential risk for the consumer resulting from the use of lidocaine in food producing species

DISCUSSION DOCUMENT

Clarifying "Emergency" for Use of Synthetic Parasiticides in Organic Livestock Production

BACKGROUND

Certain synthetic parasiticides are currently allowed for use in organic livestock production under §205.603(a)(18). In April 2016 the NOSB unanimously approved annotations amending the use of the synthetics Fenbenzadole and Moxidectin. These amendments will shorten withdrawal times for parasiticide use. In November 2016 the NOSB approved the removal of Ivermectin from the National List. These recommendations are presently pending rulemaking. The Cornucopia Institute agreed with the removal of Ivermectin from the National List due to its impacts on beneficial wildlife and lack of necessity.

Cornucopia believes there needs to be more examination of the withholding times and whether the dairy, meat, and fiber produced by livestock given synthetic parasiticides is free of those same chemicals or their components. Consumers expect organic products to be free of inputs, including synthetic parasiticides. Until that reassurance is established, the use of synthetic parasiticides should be approached with extreme caution.

SUMMARY

The Cornucopia Institute **supports** strictly defining the term "emergency" as it relates to the use of synthetic parasiticides §205.603 of the National List.

Cornucopia agrees with many of the comments the NOSB received regarding the term "emergency" in the use of these synthetic substances. It is imperative that the regulations clearly identify and require documentation of emergency situations that would allow the use of either Fenbenzadole or Moxidectin. Any definition for "emergency," with respect to synthetic parasiticides, should include language that makes it clear that these substances should only be used as a last resort to protect the welfare of a sick animal.

These substances should not be used on a routine basis, even if a livestock producer has ongoing issues with parasites. Organic livestock producers have many other tools and strategies available to them that should be explored before resorting to substances on the National List.

The use of synthetic parasiticides is appropriate under the following circumstances: an animal is sick with a confirmed parasite load when other documented methods of control have failed, the animal's welfare is being seriously impacted, and the animal is unlikely to

recover without treatment. Parasite loads must be diagnosed with a FAMACHA score for sheep or goats and fecal count for other livestock.

In addition to the following comments, Cornucopia feels that when an animal is given synthetic parasiticides it should lose organic status.

COMMENT

The Cornucopia Institute provides the following comments in response to the NOSB's request for public comment on these important issues:

Question 1: Does the term "emergency" need to be defined?
The Cornucopia Institute supports the term "emergency" being defined in the regulations. This need is paramount because, as other commenters have stated, the changes in withdrawal times present a real risk of overuse of these allowed parasiticides. For example, a fiber producer could easily treat their entire herd, or flock, well before harvest as a prophylactic measure.

Most livestock can carry small parasite loads without significant effects on their health or production. Incidental parasite loads should never be treated with synthetic parasiticides. In fact, often the best strategy is to not treat animals with incidental parasite loads. However, if treatment options are being considered, alternative methods of treatment for such incidental parasite loads are more in line with organic production and consumer acceptance.

Cornucopia is opposed to any changes that would allow for parasiticide use to become routine in organic systems. Routine use of synthetic parasiticides would undermine consumer trust in the organic label, because consumers understand that they are getting a product without synthetic inputs when they buy organic products. Additionally, while other methods of dealing with parasites are more effective and sustainable, they are also more challenging to implement (at least initially). Livestock producers may default to treating with synthetic parasiticides because it is simpler. Lastly, while parasiticides can be effective tools to treat infected livestock, parasites are developing resistance to them. Unnecessary use only hastens that resistance, with the end result being that the parasiticides are no longer effective for emergency use.

Question 2: If so, how should the term "emergency" be defined?
An *emergency* is a situation when other methods have failed to control a serious problem. An emergency situation for organic livestock would have to be one where there is a serious threat to the health and well-being of an individual animal or animals. The organic label is premised, in part, on treatment of livestock that is by and large more humane than conventional systems—and with an emphasis on preventing health problems rather than remediating them after the fact.

Part of maintaining good animal welfare is to never withhold treatment from an animal that is suffering, even if such treatment would remove an animal's organic status. Because the use of allowed synthetic parasiticides would not necessarily remove an animal's organic status, it's important to include other protective measures in the regulations and guidelines to prevent their frequent use.

The Cornucopia Institute recommends defining the term "emergency," with respect to the use of synthetic parasiticides, in the current language as (recommended addition in bolded text):

> §205.603 Synthetic substances allowed for use in organic livestock production.
> (a) As disinfectants, sanitizer, and medical treatments as applicable.
> (18) Parasiticides—prohibited in slaughter stock. Allowed in emergency treatment for dairy and breeder stock, when organic system plan-approved preventive management does not prevent infestation. **"Emergency" with respect to the use of synthetic parasiticides is defined as a serious parasite load that effects the immediate welfare of an individual animal, where the use of parasiticides is the only way to protect that animal's welfare after other documented methods of treatment have failed.**

Question 3: Should there be more specific guidelines, such as specific tests for parasite levels, as part of the producer's parasite prevention plan, before it is determined that emergency treatment with an approved parasiticide might be needed?
Cornucopia supports the development of further guidelines for both certifiers and livestock producers. It will be helpful to both certifiers and producers to have a determined cutoff point for what is a serious parasite load for each species of livestock. As experts in the field of animal health, veterinary input will be necessary when developing any specific recommendations. Fecal egg counts and FAMACHA score guidelines for treatment have already been developed, but can be further refined for use in organic agriculture.

Any guidelines should include strict requirements for documentation of steps taken before synthetic parasiticides are used. This should include a record of fecal counts in affected animals, as well as a FAMACHA score for sheep and goats.

Documentation of previous controls should also be required, showing real effort on the part of a livestock producer to cure a parasite problem using organic methods before resorting to products on the National List. Because parasite problems rarely, if ever, develop overnight, these situations are not akin to those requiring the use of antibiotics or pain relief substances.

A recurring parasite problem in a herd may indicate poor land management, poor livestock genetics, or improper selection of resistant genetics. Grazing methods, such as rotational grazing, residual heights (of plants after grazing), rest periods, and stock density can impact parasite loads and transmission on the land. Often, recurring parasite issues occur due to overgrazing, overcrowding, or inadequate rest periods between grazing intervals. Producers with reoccurring parasite problems should be required to, if they have not already, implement different grazing and herd management strategies before relying on

synthetic parasiticides. The livestock healthcare practice standard (§205.238(a)) already requires preventative measures, including breed selection, feed, and appropriate pasture management.

Question 4: What are the challenges for producers, inspectors and certifiers in verifying the documentation and implementation of a parasite management plan in organic operations, and how might these be addressed?
Cornucopia defers to ethical producers, inspectors, and certifiers to speak in detail about the burden of documentation. However, documentation is already a part of organic production and these procedures should already be part of a livestock producer's records. Recording animal health data and tracking methods used to control parasites should not add any significant additional burden to either certifier or livestock producer workload.

CONCLUSION

The Cornucopia Institute strongly supports defining the term "emergency" to prevent routine use of synthetic parasiticides in organic livestock production. With so many other options for organic management and control of parasites, these substances should be utilized as a last effort to prevent suffering in animals. Guidelines should also be developed to help certifiers and producers navigate the use of synthetic parasiticides.

COMPLIANCE, ACCREDITATION, AND CERTIFICATION SUBCOMMITTEE

PROPOSAL

Personnel Performance Evaluations of Inspectors (NOP 2027)

SUMMARY

The Cornucopia Institute supports the Certification and Accreditation Subcommittee's (CACS) proposal for field review over inspectors once per three years—with the following global concerns regarding the performance of contract and employed inspectors. Numerous complaints have been articulated by farmers and handlers concerning less than qualified inspectors. The liberalizing of the requirement for annual in-field witness audits should be offset by other supervisory requirements that will result in tangible improvements in the professional qualifications and performance of organic inspectors.

Rationale:

- Current requirements for an annual in-field witness audit are prohibitively expensive and logistically difficult to fulfill, especially for contract and international inspectors.
- Continuation of annual reviews with an in-field audit, a minimum of every three years, with additional requirements for oversight and continuing education, should suffice and can be revisited in the future as the certification industry evolves.
- Current technology can help offset the annual requirements for field audits of inspectors.

DISCUSSION

This proposal comes at a time when **The Cornucopia Institute has received unsolicited statements of numerous concerns about the qualifications of independent inspectors and their conduct in the field**. At a time when the CACS is proposing liberalizing oversight standards, we feel it is incumbent upon our organization to articulate some of the complaints we have heard.

We also hear about, and know, many highly dedicated and experienced inspectors, both independent contractors and Accredited Certifying Agent's (ACA) staff. However, there is also a mounting degree of evidence that, for a growing minority of inspectors, competency is a disappointment to ethical industry participants.

Drive-By Inspections

Numerous Farmers have told us of annual inspections where the inspector is in a big hurry and only spends a limited amount of time on their farm. Some reports have indicated that the inspectors have not visited all production fields that are certified organic and, in many cases, have not reviewed any documents or done a thorough job. We have heard statements from farmers such as, "I meticulously maintain my records every year and they are never looked at."

Unqualified Inspectors

Again, we have received numerous reports of experienced organic practitioners expressing concerns that their inspectors have no practical experience or lack knowledge concerning production agriculture. This is especially common coming from livestock producers. In many cases, these inspectors are referred to as, something along the lines of, "young people from the city." Given the experience of Cornucopia staff investigators, it sometimes requires a level of experience and savviness to discern when an organic operation is "putting on a show" for a prescheduled annual inspection, and how that might differ from an ongoing management model (and how that might deviate from the Organic Systems Plan for the operation).

Lowball Inspectors

We are told that it is common for some certifiers to depend, sometimes exclusively, on independent contractors to perform inspections. In some cases, they "bid-out" inspections that end up going to the low bidders. We have heard from disgruntled veteran inspectors that they have lost some of their historic business because they are not willing to do 3-5 inspections a day and sleep in the back of their pickup truck (these kind of comments from inspectors seem to substantiate the allegations from farmers of drive-by inspections). If some ACAs are only willing to pay poverty wages, they are not going to be able to retain the best and brightest to do inspections, and this will place high-integrity certifiers at a competitive disadvantage.

Blackballed Inspectors

We have heard accounts from experienced, veteran inspectors who are highly qualified to review handling operations that, after finding non-compliances, the processors will then contact the certifiers and demand, "I never want to see that inspector again." Instead of standing behind the credibility and competency of the inspectors, they will, characteristically, acquiesce to their "clients" and, all too often, a less experienced and more "accommodating" inspector will be assigned to the account.

Problems Identified through ACA Audits by the NOP

The proposal from the CACS, dated December 13, 2016, that we are responding to references problems uncovered with inspectors during ACA audits. It would've been helpful in this deliberative process if those problems could have been delineated for the benefit of organic stakeholders and the public. We will ask NOP management for a summary of these problems that can be presented prior to the spring 2017 NOSB meeting. It would be constructive for NOSB members, and the public, to know whether liberalizing the requirements for annual in-field evaluations might exasperate the problems identified. If that information is not forthcoming, we will file a request under the Freedom of Information Act (FOIA) and deliver our findings to the NOSB (unfortunately, given the history of the NOP's performance in complying with FOIAs, these documents may not be available in a timely manner).

Lack of Annual Inspection

It has come to our attention, again, without solicitation, that at least two major certifiers have failed to perform the legally required annual inspections on farms. We assume these deficiencies are the responsibility of the ACAs, rather than the independent inspectors. And we do not know, at this point, whether the NOP is aware of these violations of the law, and public trust. But, we will report to the NOSB, and all organic stakeholders, when we can confirm some of these allegations and, if so, who shares in the responsibility for the failures.

RECOMMENDATIONS FOR PROCEDURES AS ADJUNCTS TO IN-FIELD EVALUATIONS OF INSPECTORS

Given current available technology, a highbred of some of the following recommendations can be explored to further augment in person and in-field evaluations of inspectors:

1. Cooperative evaluations can be based on a formula developed and cost shared, based on a percentage of patronage.
2. GoPro cameras, or some other similar products, should be experimented with, so that "remote" in-field evaluations can be performed. This might be especially effective for international inspectors.
3. Quizzes that can be executed remotely can augment a certifier/certifiers understanding of the competency, and evolving knowledge, of inspectors.
4. Input can be solicited from farmers and handlers.

NOT ALL ACAS ARE CURRENTLY ATTENDING THE ANNUAL NOP TRAINING

A good argument could be made that attendance at the annual NOP training should be a prerequisite for continuing the accreditation of a certifier. In terms of the annual expenses to operate, including amortizing NOP audits, the expense should be rather modest. If this more hard line approach is not adopted, an alternative would be to create a quiz which can

determine whether or not an individual, with managerial authority, has actually gone to the effort to subsequently review meeting materials. The current guidance included in the CACS proposal is too loose and inadequate to enforce.

CONCLUSION

The Cornucopia Institute is comfortable with the CACS proposal for in-field evaluations of inspectors once every three years. However, we hope that the NOSB, and the program, will seek more input from the organic community in terms of assuring the highest level of competency in the legions of inspectors, on the front lines, and executing and maintaining organic integrity in the field.

DISCUSSION DOCUMENT

Eliminating the Incentive to Convert Native Ecosystems into Organic Crop Production

SUMMARY

The Cornucopia Institute agrees with the Wild Farm Alliance (WFA) that supporting conservation practices, addressing natural resource issues, and supporting biodiversity conservation within agriculture is essential. The conversion of native and fragile ecosystems in particular is a serious problem that *must* be dealt with in a timely manner.

The current rules offer no environmental protections prior to certification. This flies in the face of organic principles and the law as it is currently written. Cornucopia encourages the National Organic Standards Board (NOSB) to make the recommendation to the National Organic Program's (NOP) to promulgate a rule to control how new land is brought into organic production.

Cornucopia suggests that the NOP and NOSB use the term "High Value Conservation Lands" over the term "native ecosystems." High Value Conservation Lands is a more inclusive term that is more accurate with regard to the problem of conversion for organic production.

When untouched and/or high value lands are destroyed, there is no way to restore the land's pristine character. Habitat loss is the single most pervasive threat to wildlife and native plant life. Incentivizing the conversion of native ecosystems is contrary to standing organic policy and hurts the image and integrity of the organic label.

BACKGROUND

In May, 2009, the NOSB made some specific recommendations asking the NOP to establish standards for biodiversity, including biodiversity standards for accreditation and certifier audits.[23]

In December, 2014, the NOP published the 5020 Draft Guidance Natural Resources and Biodiversity Conservation for Certified Operations in the *Federal Register,* requesting public comment. The final guidance was completed, after consideration of public comment,

[23] Formal Recommendation by the National organic Standards Board to the National Organic Program [PDF] Subject: Biodiversity Conservation. May 6, 2009. Available online: https://www.ams.usda.gov/sites/default/files/media/NOP%20Final%20Rec%20Biodiversity.pdf

in January, 2016.[24] The NOP acknowledged they were only addressing a couple of the NOSB's 2009 recommendations, and the biodiversity standards were not among them.

In February 2015, the Wild Farm Alliance (WFA) submitted a comment on the NOP's 5020 Draft Guidance. One of their concerns was the practical effect of the NOP's policy to waive the three-year waiting period for transitioning to organic production from land that has never had chemical applications. WFA pointed out that an unintended consequence of this transition policy is to incentivize the conversion of native ecosystems to organic production.

The Cornucopia Institute submitted comprehensive comments on this issue at the spring 2016 NOSB meeting. Those comments still stand as relevant to this discussion.

These issues have been on the table for a long time and any further delay in acting will be costly to the environment and the integrity of the organic label.

DISCUSSION

Cornucopia supports the comments made by WFA, and their allies, on this topic. In general, we ask that rulemaking takes place to prevent the destruction of valuable ecosystems and at-risk land. Biodiversity loss is a global crisis, and the organic label is already aimed at protecting biodiversity and sustainability in agriculture.

As the NOP states in its guide for organic crop producers: *"Sustainability can be defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs."*[25] The destruction of our environment carries similar concerns: threats of climate change, habitat destruction, and trophic collapse. It is imperative that we protect and conserve as much wild land as possible.

The tenants of organic agriculture that speak to restoration of land, soil, and the protection of biodiversity are essential, but would not make up for the loss of sensitive or imperiled ecosystems. Restoration can only return some of the benefits wild lands offer. At a minimum, organic agriculture should never contribute to the environmental problems our world faces today.

Cornucopia has the following responses to the questions posed by the NOSB:

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[24] Guidance Natural Resources and Biodiversity Conservation [PDF]. NOP 5020. Agricultural Marketing Service. Effective Date: 1/15/16. *Available online:* https://www.ams.usda.gov/sites/default/files/media/NOP%205020%20Biodiversity%20Guidance%20Rev01%20%28Final%29.pdf

[25] *Guide For Organic Crop Producers*, By Pamela Coleman National Center for Appropriate Technology (NCAT) Agriculture Specialist. November 2012. *Available online:* https://www.ams.usda.gov/sites/default/files/media/Guide-OrganicCropProducers.pdf

Question 1: Please provide specific data on the occurrences of organic agricultural conversion of high value lands or fragile ecosystems.
Cornucopia would like to point to the data provided by Wild Farm Alliance (WFA), a trusted authority in this area. As the Discussion Document revealed, conversion of 1.6 million acres of grassland occurred between 2008 and 2012. Some of that land went into organic production. Additional conversion for organic production has undoubtedly occurred since then.

Question 2: What definition of high value conservation land or fragile ecosystem should be used?
Cornucopia agrees with WFA's definition of "high conservation value areas." This term should be used in place of "native ecosystems," as it is a more accurate portrayal of the lands in question. This definition should not exclude land coming out of the Conservation Reserve Program (CRP) or areas of pristine native ecosystem that may not have other known characteristics. High conservation value areas always provide some services, either as habitat for wildlife and plants and/or as ecosystem services for human populations. In addition, more of these lands are being destroyed every year whether it be from agriculture, resource harvesting, or urban sprawl. Organic agriculture should not contribute to that destruction.

The definition of lands that fall under the "high conservation value areas" should include:

- Land or aquatic environments (particularly riparian ecosystems or wetlands) that are habitat or potential habitat for vulnerable, threatened, or endangered plants or animals, as identified by the IUCN Red List of Threatened Species[26] and federal and state law. Any areas that provide habitat for imperiled or declining species of plant or animal should be outright prohibited from conversion to farmland.
- An ecosystem which is significant at global, national, or regional levels and that contains viable populations of most of the naturally occurring species found in that ecosystem in natural patterns of distribution and abundance.
- Rare and fragile ecosystems, as protected by local law or defined by the IUCN Red List of Ecosystems.[27]
- Areas that provide critical ecosystem services (e.g., watershed protection, pollution filtration, carbon sequestration, and flood control). There should be an assumption in the rule or guidelines that areas which historically provide these ecosystem services continue to provide those same services.

Question 3: How can high value land and fragile ecosystems best be protected under in USDA organic certification. Should the NOP issue Guidance on conversion of high value land, or fragile ecosystems? Should a Rule change, such as an addition to 7 CFR 205.202 be recommended in order to address conversion of high value lands or fragile ecosystems?

[26] http://www.iucnredlist.org/
[27] In the U.S., producers and certifiers can refer to NatureServe's Terrestrial Ecological Systems of the United States for guidance on what ecosystems might meet this requirement

Cornucopia agrees with WFA that a rule change in 7 CFR 205.202 is needed to effect the appropriate change. A guidance will not suffice because the conversion of the land in question *occurs prior* to organic production, while NOP regulations currently apply to land that is already certified, or is part of land in its three-year conversion period. Only a rule change, or addition, will make it clear that conversion of sensitive lands falling under the definition of high conservation value areas is absolutely prohibited.

The rule should require the following:

> To qualify for organic certification, operators must not have cleared, burned, drained, cultivated, or otherwise irrevocably altered established, diverse, and abundant ecosystems or high conservation value areas within five years preceding the date of application for certification of a parcel. This restriction does not stop operators from harvesting wild crops or from managing production systems that sustain the diversity and abundance found in these ecosystems, such as mechanical collection of native seeds.

We recommend that the certifiers' Organic System Plan forms collect sufficient information for the certifier to assess the conservation value of each parcel covered by the certification application. A guideline may need to be established after the rulemaking to direct certifiers and producers in following the letter of the law.

Question 4: What incentives, and/or disincentives could be implemented within current USDA organic regulations to prevent the conversion of high value land and fragile ecosystems?

A complete prohibition is the best way to prevent the conversion of high-value land and fragile ecosystems. However, using an eligibility period would de-incentivize conversion of high-value lands.

Cornucopia recommends that an eligibility period of five years be established in a rulemaking. At a minimum, this eligibility period should be longer than the current three-year rate of conversion for conventionally managed farmland.

Question 5: Should there be an extended waiting period for land seeking organic certification that has recently been converted from high value land or fragile ecosystems? If so, what duration should the waiting period be and why?

An eligibility period would require that if the high value conservation areas in question are damaged or destroyed within five years prior, they *will not be eligible for organic certification at all.* This is dissimilar to a *waiting period*, as Cornucopia is concerned that a waiting period would ultimately not prevent the loss of these vital ecosystems. For example, a farmer may have adjoining parcels or organic farmland and pristine habitat. Even if a waiting period is established it would not prevent that farmer from then degrading that high conservation value area once the waiting period is up.

For producers concerned about losing any economic value they may have in the land, they can acquire conversation easements or pursue other conservation grant avenues (including

the Conservation Reserve Program). These programs return the value of that land to the producer, while protecting the sensitive ecosystem in question.

Organic production should focus on taking depleted land within the conventional agricultural sphere and restoring it to a more holistic state.

CONCLUSION

The conversion of native and high-value ecosystems, in particular, is a serious problem that *must* be dealt with in a timely manner. When pristine and imperiled ecosystems are destroyed, there is no way to get them back, even if significant restoration is done. Conservation of already-existing wild ecosystems is necessary, as habitat loss is the single most pervasive threat to wildlife and native plant life. Finally, incentivizing the conversion of high-value land is contrary to standing organic policy and hurts the integrity of the organic label.

It is essential that the NOP develop a rulemaking to prevent the conversion of high value conservation areas to organic production. **At a minimum, a rulemaking should require an eligibility requirement of five years, or more, to de-incentivize this kind of conversion**.

Consumers expect their organic food to come from a source that is ecologically sound. This means that, at a minimum, the methods of organic production should *do no harm* to biodiversity and ecological systems. Or, as the 2001 NOSB Principles of Organic Production and Handling state: "Organic agriculture is an *ecological production management system that promotes and enhances biodiversity,* biological cycles, and soil biological activity" [emphasis added].[28]

WFA produced a valuable guide regarding Biodiversity Conservation in Organic Agriculture Systems in April, 2012.[29] This guide is comprehensive in its review of how organic regulations and guidance documents require that biodiversity be considered throughout every facet of organic production.

This is an ongoing and serious trend that requires immediate action on the part of the NOSB and NOP. **Both the NOSB and the NOP have been aware of this issue since 2009. The rate of destruction will not stop until the NOP acts.** Time is running out for many fragile ecosystems, and Cornucopia and our allies urge expediency in this rulemaking.

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[28] NOSB Principles of Organic Production and Handling. Adopted October 17, 2001. Article 1.1

[29] Biodiversity Conservation Draft Guidance - Wild Farm Alliance [PDF]. Available at: http://www.wildfarmalliance.org/resources/NOP_WFA_BDGuidance.pdf

CROPS SUBCOMMITTEE

2019 SUNSET SUBSTANCES

Biodegradable Biobased Mulch Film

"Biodegradable plastic mulch made from bioplastics"

SUMMARY

The 2015 report[30] from the Organic Materials Review Institute (OMRI) and the 2016 supplemental technical review by OMRI[31] definitely establish that biodegradable biobased mulch film (BBMF), as was first proposed for the National List and as specified in the NOSB recommendation and NOP regulations, does not currently exist. The recommendations, regulations, and NOP Policy Memo 15-1 (2015) make it clear that the BBMF must be 100% biobased. According to the 2015 OMRI's report, based on consultation with manufacturers, "In summary, the biobased content for commercially available BBMFs at the time of this report ranges from ~10-20%, with the remaining portion being derived from fossil fuels or other inorganic materials such as minerals and dyes."[32]

BACKGROUND (From Crop Subcommittee Discussion Document)

Biodegradable biobased mulch films were approved for placement on the National List of approved synthetics without detailing how much non-biobased content would be allowed. **The vast majority of mulch films in this category contain 20% or less biobased materials, with the remainder consisting of polymers, colorings, and other synthetic materials**.

There are some products that might meet the biobased aspect of this material's definition on 205.2, but are either not fully biodegradable or are not used widely in production due to brittleness or other production issues.

In January 2015, the National Organic Program issued Policy Memorandum 15-1, requiring that biodegradable biobased mulch film must not contain any synthetic polymer feedstocks. The NOSB requested a **limited scope technical review (TR) in 2016**. This TR focused upon biobased biodegradable mulches that contain polymers, and the soil and crop

[30] OMRI, 2015. Report on Biodegradable Biobased Mulch Films
https://www.ams.usda.gov/sites/default/files/media/Biobased%20mulches%20report.pdf
[31] OMRI, 2016. Supplemental Technical Evaluation Report: Biodegradable Biobased Mulch Films
https://www.ams.usda.gov/sites/default/files/media/BiodegradableBiobasedMulchFilmTRCrops.pdf
[32] OMRI, 2015. Report on Biodegradable Biobased Mulch Films
https://www.ams.usda.gov/sites/default/files/media/Biobased%20mulches%20report.pdf

health effects they may have as they biodegrade. The supplemental TR (STR)[33] was **inconclusive, since research on these materials is currently limited**. (Emphasis Added)

Crops Subcommittee Action

The CS would like public input on the following questions:

1. Can you provide additional information to answer the questions in the 2016 Supplemental Technical Evaluation Report (STR) on biodegradable biobased mulch films?
2. Can you provide information on the existence or development of biobased biodegradable mulch films that would meet the requirements of NOP policy memorandum 15-1?

DISCUSSION

The issues around the use of biobased biodegradable mulch films (BBMF) in organic agriculture are suggested in the background submitted by the Crops Subcommittee, but more clearly and comprehensively recapped by the 2015 report by the Organic Material Review Institute (OMRI) on BBMFs[34]:

> The final rule also indicated in the BBMF listing in §205.601 that these mulches must be produced without organisms or feedstock derived from excluded methods. After publication of the final rule, there was confusion among Material Review Organizations (MROs) and certification agencies about how much of the feedstocks must be biobased. **The current market of BBMFs appears to have only a small portion of biobased feedstocks, with the remaining derived from petroleum sources**. In response, the NOP published Policy Memo 15-1 (2015), clarifying that all BBMF feedstocks must be biobased, and that **synthetic polymer feedstocks, such as petrochemical resins, do not comply with the USDA organic regulations**. As such, it is understood by the organic industry that **there are no BBMFs on the market that meet this requirement** at the time of this report, although they are compliant with the requirements for compostability and biodegradability, according to the appropriate ASTM standards.

In addition, the OMRI report further states "In summary, the **biobased content for commercially available BBMFs at the time of this report ranges from ~10-20%**, with the remaining portion being derived from fossil fuels or other inorganic materials such as minerals and dyes."[35]

The 2016 Supplemental TR (STR) was requested to evaluate the potential effects on soil

[33] OMRI, 2016. Supplemental Technical Evaluation Report: Biodegradable Biobased Mulch Films https://www.ams.usda.gov/sites/default/files/media/BiodegradableBiobasedMulchFilmTRCrops.pdf.
[34] OMRI. "Report on Biodegradable Biobased Mulch Films." USDA NOP Petitioned Substance Database. June 2015. https://www.ams.usda.gov/sites/default/files/media/Biobased%20mulches%20report.pdf
[35] ibid

and crops health of the biodegradation of BBMFs. **However, the STR was inconclusive, and many questions still remain unanswered due to the limited scientific research data currently available on these materials.** In fact, when considering the questions posed by the Crops Subcommittee (CS), the STR states, "Although these mulches, referred to herein as biodegradable mulch films (BMFs), do not meet the requirement for 100% biobased polymer content specified in NOP Policy Memo 15-1, they are discussed in this technical report, since they have undergone field research related to the focus questions requested by the subcommittee, whereas very little field research on 100% biobased biodegradable mulch film is reported in the literature."[36]

Environmental and Health Effects

Two research projects funded by USDA's National Institute of Food and Agriculture Specialty Crop Research Initiative—the first carried out between 2010 and 2013 (SCRI 1) and the second funded for four years, beginning in 2014 (SCRI 2)—provide much of the data used in the STR.

- **Current research reports a lack of reliable methods for measuring biomass carbon, or carbon residues,** from the degradation of BMFs, but "one of the current SCRI 2 project goals is to determine how BMFs contribute to the carbon cycle, including the fractions that are bio-assimilated, lost to the atmosphere as CO2 via respiration, or converted into stable soil organic carbon: humus."[37]
- Researchers observed highly variable and, at times, conflicting results concerning soil organic matter mineralization under BMF.[38]
- Studies conducted under SCRI 1 concluded that factors other than the use of BMF were more important in determining soil quality, and many additional factors are being evaluated in the SCRI 2.[39]
- **There is a lack of evidence on the potentially ecotoxic effects of BMFs degradation on soil microbial communities** and, in general, the effects of BMFs on soil health are not well understood and need further study. More research is underway as part of SCRI 2.[40]
- **Cumulative impacts of continued use of BMFs is also uncertain**. The STR reports on research by Brodhagen et al., who looked at the potential for long-term accumulation of fragments with continued use of BMFs that pass the ISO 17088 (2012) and ASTM D6400-12 (2012) composting standards. They report that the **biodegradability standards of these tests would permit the accumulation of small plastic fragments (< 2.0 mm), as well as up to 49% of the concentration of regulated metals allowed for sludges, fertilizers and composts**. A new testing standard under consideration for aerobically biodegradable plastics in a soil

[36] OMRI, 2016. Supplemental Technical Evaluation Report: Biodegradable Biobased Mulch Films. Lines 17-21
[37] OMRI, 2016. Supplemental Technical Evaluation Report: Biodegradable Biobased Mulch Films. Lines 97-102
[38] OMRI, 2016. Supplemental Technical Evaluation Report: Biodegradable Biobased Mulch Films. Lines 118-134
[39] OMRI, 2016. Supplemental Technical Evaluation Report: Biodegradable Biobased Mulch Films. Lines 180-197
[40] OMRI, 2016. Supplemental Technical Evaluation Report: Biodegradable Biobased Mulch Films. Lines 200-219

environment, ASTM WK29802 (2014) would result in similar conditions: persistence of 10% of the plastic mass after 2 years for each constituent present in the material at a concentration of more than 1%. With their assumptions, the authors calculate that **if any portion of the remaining 10% represents recalcitrant polymers, metals, or untested components, they will accumulate with repeated applications in the soil in a manner that can be estimated.**[41]

- Similarly, the STR reports, "There is a lack of specific evidence in the current scientific literature to show that the breakdown of BMF polymers adversely affects soil and plant life or subsequently grazing livestock. . . Although **these studies did not uncover significant impacts of BMF degradation products on soil or plant life, it is generally accepted that any such impacts are poorly understood and need further study**.
- **Regarding livestock** that may graze crop residues or forages grown subsequent to the use of BMFs, Brodhagen et al. (2015) report that **it is unknown what effect the ingestion of plastics has on terrestrial organisms**. It has been noted that plastics can absorb pesticides and other contaminants, such as mycotoxins, in the environment."[42]
- The STR reports variation in decomposition of BMFs is affected by soil temperature, moisture, pH, nitrogen content, native microbial populations, and type of BMF.[43]
- The STR states, "It is currently unknown whether complete degradation of BMF is possible." **There are many intermediates produced during the decomposition process**. "The effect of BMF **additives, processing aids, and their metabolites which are released into the environment** during BMF degradation have not been extensively addressed in the scientific literature." "Breakdown of a BMF polymer could potentially result in the release of nutrient elements such as nitrogen, with potential implications as a fertilizer or cause of toxicity, as in the case of ammonium, though such a scenario is more likely to occur in composted mulches." "Research related to the risks and benefits of carbon emissions during microbial breakdown of biodegradable mulches has yet to be undertaken; however, increased mineralization of soil organic matter due to elevated temperature and moisture has been cited as a source of increased greenhouse gas emissions."[44]

In summarizing the research on the impacts on soil health, the STR states, "These findings suggest that the effects of BMF degradation on soil quality will vary substantially based on a combination of factors, including the type of BMF used, location, cropping system and time since mulch incorporation."[45]

[41] OMRI, 2016. Supplemental Technical Evaluation Report: Biodegradable Biobased Mulch Films. Lines 245-253
[42] OMRI, 2016. Supplemental Technical Evaluation Report: Biodegradable Biobased Mulch Films. Lines 271-295
[43] OMRI, 2016. Supplemental Technical Evaluation Report: Biodegradable Biobased Mulch Films. Lines 313-377
[44] OMRI, 2016. Supplemental Technical Evaluation Report: Biodegradable Biobased Mulch Films. Lines 383-436
[45] OMRI, 2016. Supplemental Technical Evaluation Report: Biodegradable Biobased Mulch Films. Lines 58-60

Essentiality

Are BBMFs essential? It could be argued that to the extent that plastic mulch is used for weed control and water retention, natural mulches and cover crops can perform these functions rather effectively as well, approaches that may be more compatible with organic production.[46] However, there are other benefits to plastic mulches, such as increased soil warming, higher yields, and ease of use. Plastic mulches are routinely used throughout the organic farming industry.

Removal

The biodegradable biobased mulch film, which was originally petitioned as "biodegradable plastic mulch made from bioplastics" is, in spite of all the qualifiers, a synthetic plastic. As such, it is subject to the OFPA restriction that prohibits the use of "plastic mulches, unless such mulches are removed at the end of each growing or harvest season." (OFPA §6508(c)(2))

The nomenclature of these products appear to have been changed for political purposes—removing the "P-word (plastic) from prominence in the initial discussion.

Additional research is necessary to determine an adequate and appropriate criteria for biodegradability—and, hence, define a removal timeframe acceptable under OFPA. NOP's regulations inappropriately remove the NOSB requirement for producers to take the appropriate steps to ensure biodegradation within the timeframe allowed by OFPA.

The standard for biodegradation must equate the removal at the end of each growing or harvest season. Neither the standard put into regulation by NOP, nor the standards proposed by the NOSB, appear to be adequate to ensure complete removal. They fail to address the wide range of conditions found on organic farms which, as mentioned above, significantly affect BBMFs biodegradability. A short review of the current state of affairs with respect to biodegradable biobased bioplastic mulches states:[47]

> "Many types of mulch claiming to be biodegradable are actually compostable, and fulfill the requirements of ASTM D6400, or related standards. Moreover, no standard currently exists for measuring the biodegradability of plastics buried in soil under field soil conditions. To meet this need for measuring biodegradability within the soil, ASTM is developing a standard through a specification (Work Item 29802) entitled "Aerobically Biodegradable Plastics in the Soil Environment" (Ramani Narayan, ASTM Fellow, personal communication). In this new standard, biodegradable mulches must break down into CO_2, water and environmentally benign substances within one or two years, leaving no harmful residues. The ability of existing and emerging biodegradable plastic mulch products to meet these criteria in the soil environment is still being researched."

[46] 2012 TR on Biodegradable Mulch Film Made from Bioplastics. Lines 684-721

[47] Corbin, A., Miles, C., Cowan, J., Hayes, D., Inglis, D., and Dorgan, J. 2013. Using biodegradable plastics as agricultural mulches. Washington State University Extension Fact Sheet: FS103E. Available at: http://cru.cahe.wsu.edu/CEPublications/FS103E/FS103E.pdf

Therefore, and as discussed in the STR, the Cornucopia Institute believes that <u>it is not yet possible to establish adequate criteria that can be implemented by materials review organizations, certifiers, and growers</u> that will ensure biodegradability to the extent required by OFPA.

Nanomaterials

The Cornucopia Institute is also concerned about the removal of the prohibition on engineered nanomaterials from the NOSB's motion. Miles McEvoy, Deputy Administrator, stated at the Fall 2012 NOSB Meeting that MROs can depend on NOSB recommendations:

> "Then if there were particular questions about, let's say, the clause and nanomaterials is removed, if there were questions that a manufacturer was using nanomaterials, they would go to the final recommendation from the NOSB on nanomaterials to say that those are synthetic substances and are not allowed in those substance -- those products that are being approved."

However, history has shown that interpretations of law are subject to change, and NOSB recommendations have not always been implemented: **The Cornucopia Institutes urges that a prohibition on engineered nanomaterials be added if, and when, annotations are considered.**

CONCLUSION

Biodegradable bioplastic mulch film currently available on the market does not meet the OFPA standards or organic regulations. Therefore, NOSB action is required to reaffirm an earlier board decision that establishes the parameters for 100% biobased mulch. In light of the new scientific information that has emerged since BBMF was originally petitioned, the NOSB has a duty to clarify, and perhaps enhance, the restrictions on this material's use.

The Cornucopia Institute supports a strengthening of the annotation on allowed 100% biobased mulch; however, considering the dearth of scientific data and the current lack of commercial availability of 100% biobased mulch, The Cornucopia Institute suggests that the board retains the listing for BBMF with an annotation that meets the standards of the law.

The Cornucopia Institute further recommends that, <u>regardless of the commercial pressure to allow this material as currently available in the market</u>, the NOSB reinforces the fundamental principles and safeguards of the NOSB's Fall 2012 decision that was intended to protect against adverse environmental impacts, including adverse effects to soil ecology.

Coppers, Fixed and Copper Sulfate

SUMMARY

The Cornucopia Institute supports the relisting of synthetic copper sulfate and fixed copper products, as **"restricted use" materials**, provided that copper products are used in a manner that minimizes copper accumulation in the soil, and **with the added annotation: no visible residue is allowed on harvested crops and use needs to document multiple alternative attempts to control target including in-field diversity.**

Cornucopia is aware of "organic" monoculture tomato farms that use regular prophylactic copper sprays on a weekly basis throughout the season, rather than attempting to control foliar blights with greater crop diversity and lower plant density. Therefore, we recommend that the Crops Subcommittee further investigate the particular uses of copper products in plant disease control to determine when they are necessary and **should propose an annotation for specific uses and rates.** Furthermore, we recommend setting **an annual maximum application rate** for copper products.

Rationale:

- The overuse of copper fungicides is common on large acreages of organic monoculture processing tomatoes, particularly in the humid East. Routine, weekly copper sprays result in visual residues on the plants.
- **Copper should not be used routinely throughout the season.** Applications should be weather-dependent. Cooler, wetter seasons require more applications than drier seasons. Early applications, when tissues are soft and more susceptible, can prevent the need for later applications.
- **The use of copper products as fungicides should not be considered before adequate soil and cultural management practices are employed.**
- Numerous disease-preventative, **cultural strategies exist to prevent the need to spray routinely,** such as highly diverse plantings; reduced plant density; minimum 3-year crop rotations; intercropping; host resistance; sanitation practices; planting buffer strips and cover crops; and applying biological control organisms, compost, and natural and synthetic horticultural oils.
- The broad-spectrum nature of copper materials **can harm natural and released biological control agents,** contributing to the "pesticide treadmill" that organic practices are designed to avoid.
- There are non-copper materials that are effective as fungicides on the National List (NL), including aqueous potassium silicate, ammonium carbonate, sulfur, and hydrogen peroxide, although some plant diseases do not respond as well to them as copper.
- The Crops Subcommittee should consider commissioning a TR to investigate the possibility of adding phosphorous acid to the NL to control oomycete pathogens and reduce dependence on copper.

- There are soil types that are copper-deficient and require copper supplementation.

DISCUSSION

Copper sulfate is a **synthetic substance** allowed for use (with restrictions) in organic crop production as described below:

- For plant disease control, provided that it is used in a manner that minimizes copper accumulation in the soil. Fixed copper materials cannot be used as herbicides.
- In aquatic rice systems, as an algicide and insecticide (to control tadpole shrimp). Use 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.[48]

When copper sulfate and fixed copper products are used in agriculture, they eventually dissociate to form a positively charged copper particle that persists and accumulates in the environment.[49]

Copper sulfate is exempt from any EPA tolerance level requirements when it is applied as a fungicide on crops or on raw agricultural commodities after harvest. This exemption also applies when copper sulfate is used as an algicide, or herbicide, either in irrigation systems or in bodies of water where fish or shellfish are cultivated.[50]

Coppers, fixed, allowed for plant disease control for organic crop production, are also "copper products that are exempt from tolerance by the EPA."[51] This includes Bordeaux mixture, basic copper carbonate (malachite), copper-ethylenediamine complex, copper hydroxide, copper-lime mixtures, copper linoleate, copper oleate, copper oxychloride, copper octanoate, copper sulfate basic, copper sulfate pentahydrate, cupric oxide, cuprous oxide. These materials "must be used in a manner that minimizes accumulation in the soil and shall not be used as herbicides."[52]

In 2009, the EPA required revised labels on copper products to define maximum single application rates for each crop and the maximum amount of copper that can be applied each year. Labels were required to include advice on how to limit spray drift during

[48] http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=79c4ebcacc3e33f160e0024456ef889f&n=pt40.24.180&r=PART&ty=HTML#se40.24.180_11021

[49] https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/red_G-26_1-Jul-06.pdf

[50] http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=79c4ebcacc3e33f160e0024456ef889f&n=pt40.24.180&r=PART&ty=HTML#se40.24.180_11021

[51] https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/red_G-26_1-Jul-06.pdf

[52] ibid

application. The goals were to reduce the potential for introducing more copper into ecosystems than was necessary and to limit the exposure to non-target organisms.

Technical Report

The 2011 TR is incomplete and out of date. There is no evidence of the method used to determine what is considered to be the maximum allowable level of concentration of copper that "minimizes residue." There is no discussion about the current concerns regarding grower dependence on the use of copper as a fungicide.

Many large-scale, split organic/conventional monoculture-style operations use frequent (weekly) copper sprays as their primary disease management strategy.[53] Fields may be abandoned to prevent toxicity. The over-reliance on copper for disease management is not in line with OFPA. Further investigation into the particular uses of copper products is needed to determine when they are necessary so that annotations for specific uses and rates can be proposed.

Essentiality to Organic Crop Production

There are some diseases, such as black rot in grapes and late and early blight in tomatoes, for which no other fungicide, listed for organic use, is more than weakly effective.[54] If spraying a copper product is deemed necessary, timing the application with pathogen lifecycles, severity of infection, forecasted weather, and growing conditions needs to be taken into consideration to determine a spray schedule. Use of a spray schedule that alternates application of a copper material with a non-copper material should be considered to reduce the total amount of copper used.

In addition, there are some soil types that are copper-deficient and require copper supplementation. In these cases, deficiencies should be documented and use should not exceed recommended supplementation rates.

Alternatives Exist

Alternative methods for disease control on organic crops include growing with high plant diversity, selecting resistant plants and cultivars, managing nutrients, and rotating crops. Adequate scouting for disease and hygienic practices, such as carrying out diseased material, training and pruning perennial trellised crops to maximize air flow, and spacing plantings for maximal air flow, also prevent disease.

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[53] First hand observation by a Cornucopia Institute staff member while doing graduate research on hundreds of organic farms in the Eastern US

[54] https://www.extension.purdue.edu/extmedia/bp/bp-69-w.pdf

Other approved organic pesticides can be used for pest and disease control, including sulfur products, horticultural oils, neem oil, and bicarbonates,as well as hydrogen peroxide and salts.[55,56]

Environmental Concerns

Copper-based fungicides accumulate copper in the soil. Some of this copper is not available to living things because it forms biologically unusable complexes; however, biologically available copper can cause toxic effects, both in soil and in water.[57]

The toxic action of copper is attributed to its ability to deactivate proteins.[58] The long-term application of copper-based fungicides in vineyards was found to adversely affect soil microbial enzyme activity.[59]

Typical application rates of copper-based fungicides exceed toxicity levels for most animals studied.[60] Decreases in soil biodiversity, earthworm growth, and organic decomposition are observed as copper levels increase.[61] The effect of added copper on soil microorganisms depends on the species, soil pH, and organic content of the soil.[62,63]

Aquatic plants are more sensitive to copper than terrestrial plants. Copper can enter bodies of water by soil leaching, spray drift, or from direct water application.[64] When copper sulfate is released into waterways, there is an increased risk of fish mortality from "copper water toxicity, accumulation in sediment, and possible benthic community degradation."[65]

Copper sulfate applied at rates needed to control algae in rice production may kill frog species that feed on algae. Copper sulfate, and related copper substances, can also kill beneficial zooplankton resulting in negative affects to the benthic organisms that maintain the aquatic ecosystem.[66,67]

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[55] http://www.oardc.ohio-state.edu/fruitpathology/organic/grape/organic.html

[56] https://www.extension.purdue.edu/extmedia/bp/bp-69-w.pdf

[57] https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/red_G-26_1-Jul-06.pdf

[58] http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5089146&acct=nopgeninfo

[59] http://www.sciencedirect.com/science/article/pii/S0038071710002956

[60] https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/red_G-26_1-Jul-06.pdf

[61] Bogomolov DM, Chen SK, Parmelee RW, Subler S and Edwards CA (1996) An Ecosystem Approach to Soil Toxicity Testing: a Study of Copper Contamination in Laboratory Soil Microcosms. *Appl. Soil Ecol*., 4, 95-105

[62] Lejon DPH, Martins JMF, Leveque J, Spadini L, Pascault N, Landry D, Milloux M, Nowak V, Chaussod R and Ranjard L. (2008) Copper Dynamics and Impact on Microbial Communities in Soils of Variable Organic Stutus. *Environ. Sci. Technol*., 42, 2819-2825

[63] Hashem AR. (1997) Effect of Heavy Metal Ions on the Mycelia Growth of Some Fungi Isolated from the Soil of Al-Jubail Industrial City, Saudi Arabia. *J. King Saud. Univ*., 9, 119-124

[64] https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/red_G-26_1-Jul-06.pdf

[65] http://www.littline.com/images/Aquatic_Herbicide_Impacts.pdf

[66]http://www.beyondpesticides.org/organicfood/action/fall2011/BP%20comments%20on%20coppersulfate.final.pdf

[67] http://www.ibnature.com/copper-compounds-as-algaecides; http://www.researchgate.net/publication/269398599_Effects of copper sulfate on zooplankton communities in ponds submitted to agricultural intensification

Human Health Concerns

Symptoms from copper exposure include nausea, vomiting, headaches, and skin and eye irritation. Copper dust or powder causes the most irritation. Most copper compounds have low systemic toxicity, due to their low solubility and absorption.[68]

The risk of acute exposure to copper is primarily to pesticide applicators. Concentrated copper products can cause irreversible eye damage. Prolonged or frequent skin contact can cause allergic reactions.[69]

CONCLUSION

The Cornucopia Institute **supports the relisting** of copper sulfate and fixed copper products on the National List.

Some diseases have no effective organic alternative. However, in order to be able to ensure that the use of copper materials in organic production is **limited to that which is necessary and does not harm the environment**, **the NOSB must solicit input on the current uses of copper products in organic production and annotate the listings to minimize use.** There should be required regular soil testing and maximum loading rates.

[68] https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/red_G-26_1-Jul-06.pdf
[69] http://pmep.cce.cornell.edu/profiles/extoxnet/carbaryl-dicrotophos/copper-sulfate-ext.html

DISCUSSION DOCUMENT

Aeroponics/Hydroponics/Aquaponics

SUMMARY

The Cornucopia Institute **supports the clear definitions** in the Crops Subcommittee (CS) discussion document on aeroponics, hydroponics, and aquaponics. We agree with the CS's recommendation to add these terms to 7 CFR §205.105 as practices prohibited in organic production. These definitions are consistent with the scientific literature.

The NOP should adopt the European standard that requires that organic crops be grown in the soil in the ground, except for edible sprouts, aquatic plants growing outdoors in their native ecosystems, and transplants sold in their containers.

Attempts by some certifiers, the OTA, and the hydroponic container lobby to distinguish soilless container systems from other hydroponic systems based on "biology" in the system are arbitrary. "Pure," liquid-only hydroponic systems also have "biology" in the system, so much so that ozone is used to reduce biological activity. Whether or not fertilizers are added in a soluble form, or solubilized by bacteria, is irrelevant. Soilless systems are *not* organic systems, because they are removed from the regenerative organic practices that capture carbon and nitrogen from the atmosphere into the soil.

Cornucopia disagrees with the concept put forth in the discussion document that hydroponic systems could be labeled organic, provided they also indicate "grown without soil" on the label. It is impossible for these systems to comply with organic regulations that require regenerative soil fertility practices. It is our contention that, in reading both the regulations and the enabling legislation (OFPA), this work-around to appease corporate agribusiness would be illegal.

Since its release last July, Cornucopia has strongly supported the Hydroponic Task Force 2010 NOSB Recommendation Subcommittee Report and comments submitted by Task Force member Dave Chapman, veteran soil-based farmer Eliot Coleman, and the hundreds of other pioneering organic farmers that understand that organic and soil go hand-in-hand.

We also support the 'Keep the Soil in Organic' international movement, including millions of farmers and eaters that want to keep the organic standards in line with its origins—not doing so seriously jeopardizes the reputation of the organic label in the marketplace.

Soilless, hydroponic/container growing is not necessarily "bad," it simply isn't organic, by law. **Allowing year-round imports from countries where hydroponic/container growing is illegal, then labeling and selling them as organic in this country,**

undercuts legitimate US organic farmers. It is dead wrong—and patently illegal under the Organic Foods Production Act and the current regulations.

***Rationale*:**

- The NOSB/NOP does not have the authority to modify the elements of the Organic Foods Production Act (OFPA) that specifically reference soil-based production as an integral requirement in organic production, including the Organic Plan, which requires farmers to "foster soil fertility." When management of the soil is not the "primary" source of fertility, that operation is violating a mandatory part of OFPA.
- We support the discussion document's discontinued use of the term "bioponics," a term invented by corporate organic interests that is not found in the scientific literature. The question of the legality of hydroponic/container growing has nothing to do with biological activity, but whether or not regenerative soil-based production practices are in place.
- Both OFPA and the NOP Final Rule describe organic agricultural production as much more than substituting approved inputs for those not approved. Hydroponic container growers take what organic farmers call "amendments" and use them to provide the majority of the fertility for the crop.
- Hydroponic/container growing is neither legal nor "sustainable." Containers dry out much faster than properly managed soil, high in organic matter, especially when drip irrigation is used. Currently, much of the hydroponic container growing occurs in low humidity, desert-like regions. Utilizing peat to fill containers involves the destruction of wetland bogs, which are the result of thousands of years of captured atmospheric carbon. Peat and coco coir contain no nutrients, so crops depend exclusively on added liquid nutrients.
- In contrast, organic farmers work with natural nutrient cycles, challenging the prevalent industrial, input-based model of agriculture. Organic certification standards require on-farm practices that foster soil health by means of managing crop residue, manures, composting, and cover cropping. Regenerative agriculture, which includes carbon soil sequestration, is not being practiced in hydroponic/container systems.
- Many hydroponic container systems primarily depend on conventionally grown hydrolyzed soybeans, undoubtedly Roundup®-ready/GMO, which is prohibited in organic. These systems depend on unsustainable soybean farming for their fertility. Any claims that hydrolyzed soybeans are non-GMO cannot be confirmed through testing, because DNA is denatured under the high temperatures and strong acid incurred during soybean hydrolysis.
- Most hydroponic operations routinely use ozone to reduce the biological contamination in the irrigation system.
- Contrary to information in the Task Force Hydroponic and Aquaponic Subcommittee's report, the scientific literature does not support the claim that compost tea is a significant source of plant nutrition. The primary source of nutrients provided in hydroponic/container systems comes from continuously added liquid nutrients that are highly processed and should be considered synthetic (i.e., the process of producing hydrolyzed soybeans requires boiling for hours in acid).

- Prior to this debate, most container growers referred to their own systems as "hydroponic." In scientific literature, and trade publications not focused on this debate within the organic industry, it still is. We agree with the CS discussion document that any container system where highly soluble liquid nutrients are applied routinely should be considered hydroponic, including a recalcitrant substrate, like peat or coconut coir.
- The purpose of the Hydroponic Task Force was, supposedly, to clarify the NOSB's 2010 recommendations; however, task force membership was initially limited to individuals with economic interests in hydroponic or aquaponic production. Though this restriction was later corrected, after public outcry, in the end, only one commercial soil-based grower was added to the 16-member panel.
- Allowing soilless, hydroponic/container growing to be labeled "organic" would conflict with international standards.
- **The NOSB/NOP does not have the legal authority to create regulations that conflict with the enabling legislation (OFPA).**

DISCUSSION

A few years ago, the organic community was shocked to find out that hydroponic operations were being quietly certified "organic," despite the law.

The violations of law and regulations are clearly conceded in the documents you are now reviewing, due to the recognized need for modifying the existing regulations (the NOSB does not have the authority to modify elements of the Organic Foods Production Act that specifically reference soil-based production as an integral requirement in organic production).

Somehow, a small section of the USDA has been redefining "organic," resulting in pressure from hydroponic growers in other countries to redefine organic as well.

The formal NOSB Recommendations on the "Production Standard for Terrestrial Plants in Containers and Enclosures (Greenhouses)" was passed on January 23, 2010 by a majority vote (twelve to one), after six years of NOSB work and public hearings.

We regret the additional delay caused by the NOP convening a task force and subsequent delay in NOSB voting on the legality of hydroponic certification.

The 2010 NOSB recommendations unequivocally state that hydroponic production should not be permitted in organic certification and that organic production of terrestrial plants must be soil-based. It is incumbent upon the current NOSB and the USDA to accept the past recommendations and to be consistent with international rules that prohibit soilless hydroponic vegetable production as certified "organic."

The NOP's decision to allow organic certification of hydroponic systems, in direct opposition to the 2010 NOSB recommendations, and without formal proposed standards,

violates the program's legal responsibility to follow the established due process in setting organic standards.

Unlawful and extreme variations in certification requirements create consumer confusion and undermine the integrity of the organic label, ultimately weakening organic markets. One of the central tenants of the Organic Foods Production Act (OFPA) of 1990 is to "*assure consumers that organically produced products meet a consistent standard*" (7 U.S.C. § 6501(2)). This lack of a consistent standard that the NOP has created with respect to hydroponic systems is exactly the type of problem that OFPA and the NOP were designed to avoid.

A stated primary objective of the USDA/NOP-created Hydroponics Task Force was to clarify the NOSB's 2010 Recommendations (80 Fed Reg. 12,422, Mar. 9, 2015). Yet, the majority of task force members chosen had a vested interest in the organic certification of hydroponics, rather than in furthering the 2010 NOSB recommendations. Therefore, the makeup of the task force caused widespread concern that their actual purpose appeared to be to rewrite, rather than to clarify, the recommendations.

In the end, only one commercial soil-based grower was chosen for the task force. **Several highly qualified task force applicants (known to support the exclusion of hydroponic production from organics) were not chosen** and the result was an unfairly biased taskforce.

The pro-hydroponics members of the task force stated in their report, and at the last NOSB meeting, that compost tea is used to provide nutrients in these "bioponic" systems. However, the scientific literature does not support that statement.

Compost tea is not a significant source of nutrients, so other nutrient sources must be relied upon for fertility. Compost tea is irrelevant to the production of a crop; in other words, a healthy crop can be produced without it. **The claim that compost tea is used to provide the required nutrients is a ruse, intended to make it seem like these systems might have something in common with soil-based production**.

In fact, most operations with cycling irrigation water routinely use ozone to reduce the biology in the irrigation system. The "bioponic" claim is an attempted work-around for §6513 of the Organic Plan: "*An organic plan shall contain provisions designed to foster soil fertility, primarily through the management of the organic content of the soil through proper tillage, crop rotation, and manuring*."[70]

Organic agriculture is rooted in the management of soils, not the simple presence, or absence, of bioactivity. Therefore, hydroponic and aquaponic growers are mistaken when they argue that hydroponics are "organic," even with the presence of microbes.

[70] https://www.gpo.gov/fdsys/granule/USCODE-2011-title7/USCODE-2011-title7-chap94-sec6513/content-detail.html

The fact is that these hydroponic/container systems would fail without the routine (several-times-a-day) use of highly soluble, highly processed fertilizers like micronized fish and hydrolyzed soy protein. Whether or not compost tea is added to the system is irrelevant to the production of a container crop with minimal, or no, soil in the system.

The Hydroponic and Aquaponic Subcommittee Report describes an organically certified hydroponic blueberry and raspberry "container" operation owned by Driscoll's. Once theses systems are examined, they are nowhere near sustainable, despite their claims.

Claims of less water use are questionable in these container systems, especially considering production for the entire country need not come from desert regions. And the focus on comparable water use is an intentional distraction from the question of whether hydroponic growing is legal under the organic law.

Containers dry out much faster than mulched soil with high organic matter. The process of mining peat to fill these containers involves draining increasingly rare wetland bogs, removing surface vegetation, and driving over these ecosystems with heavy vacuum harvesters. Scientists have described wetland peat bogs as important and fragile as rainforests, harboring many highly specialized, rare native plants. Much like fossil fuels, they are the result of thousands of years of captured atmospheric carbon. Driscoll's, Wholesome Harvest, and industries that grow in peat moss, in fact, do not represent a "Coalition for Sustainable Organics," despite the self-serving title given to the Astroturf group they founded and fund.

In addition, many of these container systems depend on conventionally grown, hydrolyzed soybeans to achieve the fertility needed to produce a crop, because peat moss and coco coir are devoid of nutrients. This, too, is not sustainable and, in fact, illegal, since the soybeans used to produce the liquid fertilizer are conventionally produced and, therefore, most likely to be Roundup®-ready/GMO, also prohibited in organics. **Any claims that hydrolyzed soybeans are non-GMO cannot be tested, because DNA is denatured under the high temperatures and strong acid incurred during soybean hydrolysis**. Some manufacturers of these products know this and tout "non-GMO," (although not labeled Non-GMO Project Verified or Organic) knowing it is difficult to prove otherwise from the final product.

From the 2010 NOSB Recommendation Subcommittee Task Force Report: "*There has been a frustrating shortage of specific information on the fertility programs being used in the currently certified hydroponic operations.... We have been unable to find organic producers who would allow us to use photos of their production…. As with all of the certified hydroponic production systems we have approached, getting clear information about current fertilization practices has been difficult, as the growers we have asked, including those on the task force, are unwilling to publically share these details. However, this has really not affected our ability to assess alignment with OFPA because* ***these systems derive their fertility primarily from***

soluble fertilizers delivered through water and not <u>primarily</u> from organic content of soil as required by OFPA."[71] [Emphasis added]

Soil fertility and soil management are prerequisites for organic certification of crop production. Hydroponic systems do not meet this mandate. Also from the 2010 NOSB Recommendation Subcommittee Task Force Report: "*When management of the soil is not the primary source of fertility, then that operation is violating a mandatory part of OFPA*."[72]

Both OFPA and the NOP Final Rule describe organic agricultural production as much more than substituting approved inputs for those not approved. The task force report also states: **"*It would be difficult to say that growing in a container is maintaining or improving the soil. It is our concern that if NOSB accepts growing a crop to maturity in containers, an amendment to the USDA organic regulation may be required*."** [Emphasis added]

The 2010 NOSB Recommendation strongly reinforces foundational principles, and descriptions of "organic," practiced on U.S. organic farms. The 1980 USDA Report and Recommendation on Organic Farming clearly states: "***Soil is the Source of Life***"—Soil quality and balance (that is, soil with proper levels of organic matter, bacterial and biological activity, trace elements, and other nutrients) are essential to the long-term future of agriculture. Human and animal health are directly related to the health of the soil. From the Task Force Report: "***It is our opinion that this [soil] web cannot be replicated by simply 'adding biology****,' because we are not smart enough to know which biology to add, nor how much… We can participate in and influence this system but we cannot control it.*"[73] [Emphasis added]

The key to nutritious produce is healthy soil. <u>A mantra for the organic community is: "Feed the soil, not the plant.</u>" Organic farming methods return organic matter into the soil, feeding billions of species in the soil, which then provide plants with nutrients from the mineral fractions of the soil. OFPA also makes clear that managing soil health is central to organic agricultural systems, as evidenced by the inclusion of details about what is expected by organic farmers as they design their annual crop and animal production system plans.

The rule also outlines a practice standard for soil fertility and crop management that is impossible to meet in a hydroponic system. In the Soil fertility and Crop Nutrient Management Practice Standard (§ 205.203): US Department of Agriculture Study Team on Organic Farming. (1980) USDA Report and Recommendation on Organic Farming, section 2.4, "Organic Agriculture, Some Basic Tenets":

- *"The producer **<u>must</u>** select and implement tillage and cultivation practices that maintain or improve the physical, chemical, and biological condition of soil and minimize soil erosion."*

[71] <u>https://www.ams.usda.gov/sites/default/files/media/2016%20Hydroponic%20Task%20Force%20Report.PDF</u>
[72] <u>https://www.ams.usda.gov/sites/default/files/media/2016%20Hydroponic%20Task%20Force%20Report.PDF</u>
[73] <u>https://pubs.nal.usda.gov/report-and-recommendations-organic-farming-usda-1980</u>

- *"The producer **must** manage crop nutrients and soil fertility through rotations, cover crops, and the application of plant and animal materials."*
- *"The producer **must** manage plant and animal materials to maintain or improve soil organic matter content in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, pathogenic organisms, heavy metals, or residues of prohibited substances." [Emphasis added]*

No language exists in OFPA outlining requirements for soilless hydroponic systems. In contrast, clear language exists to justify the prohibition of hydroponics in organics, given the fact that they cannot meet the minimum standards described above. This conflict with OFPA makes it impossible to allow the organic certification of hydroponic production.

The NOSB/NOP does not have the legal authority to create regulations that conflict with the enabling legislation (OFPA).

In addition, U.S. organic rules must be consistent with international standards. The 2010 NOSB Recommendation is consistent with the vast majority of world organic standards, including those in twenty-four countries in the European Union (EU), Mexico, Japan, and Canada. This situation has forced the U.S to create a specific hydroponics exception in its trade agreement with Canada.

The 2013 position papers of both the International Federation of Organic Agriculture Movements European Union (IFOAM EU) and the Expert Group for Technical Advice on Organic Production (EGTOP) offer well-researched recommendations on organic hydroponics that concur with the organic standards of EU countries. **IFOAM EU has produced a position paper calling for the USDA to regulate organic hydroponics based on the NOSB's 2010 recommendations**.

NOP's rationale for allowing hydroponic certification is based on a single sentence taken from the 1995 NOSB Recommendation for Specialized Standards for Hydroponic Production in Soilless Media. It states: "*Hydroponic production in soilless media to be labeled organically produced shall be allowed if all provisions of the OFPA have been met.*" This recommendation was not included in the final rule and, therefore, has no legal basis in current organic certification.

No provision in OFPA or the NOP regulations justifies the certification of hydroponics. In fact, in its written response to the NOSB recommendation in 2005, the NOP implies that standards need to be developed before hydroponic operations can be certified. The NOP states: "***NOP concurs with the NOSB and agrees to proceed with additional rulemaking for mushrooms, apiculture and honey, and greenhouse operations and their products, and not to propose hydroponic standards until the NOSB has submitted a final recommendation***."[74] [Emphasis added]

[74] https://www.ams.usda.gov/sites/default/files/media/Final%20Scope%20Guidance.pdf

The currently applicable regulatory and statutory language clearly indicates that the USDA has erroneously allowed the certification of hydroponic operations currently operating.

BY QUIETLY ALLOWING THE CERTIFICATION OF HYDROPONIC OPERATIONS, THE USDA IS IN VIOLATION OF THEIR OWN GUIDANCE TO THE INDUSTRY.

The USDA's allowance of hydroponic certification, in the absence of clear and consistent regulations, has created discontent with the NOP by the wider organic community. A demonstration of the strength of the opposition to organic hydroponics was the Moratorium Letter presented to Secretary Vilsack in April, 2016, formally requesting the USDA to institute an immediate moratorium on the organic certification of all new hydroponic and aquaponic operations. It was signed by 65 organic leaders, 15 former NOSB members, and 40 organizations, whose total membership exceeds 2.2 million people.

Consumers have a right to know how their organic food is grown. Currently, there is no way for customers to identify which food is grown hydroponically and which is not. Most consumers have no idea that soilless hydroponic growing is permitted under existing USDA organic standards. **With increasing publications on "nutrient-dense foods" and the release of the human microbiome project, consumers are more and more aware of the connections between production practices and nutritious, healthy food.**

From the Moratorium Letter: "*We must not take trust in organic for granted, either from the organic community as a whole, or from organic agriculture producers. It took decades to build trust in the organic label, and we must not squander it by ignoring due process. Yet, disturbing signs of eroding public trust in organic are evident.*"[75]

Soil farmer David Miskell summarized it well, "*My work on many of the most successful organic farms in the U.S. and Europe leads me to the conclusion that soil based organics blends soil life, non-synthetic minerals, organic residues and physical care of the soil and surrounding lands to create an innovative balanced environment. Do we know all the mysteries of this process? NO, but we are learning.*"

To allow the entire organic industry to suffer public mistrust, due to unnecessary confusion regarding basic greenhouse standards, is short-sighted public policy.

We must not compromise the organic standards in an effort to increase sales and open new markets at the expense of the public confidence and organic integrity.

[75] http://www.keepthesoilinorganic.org/

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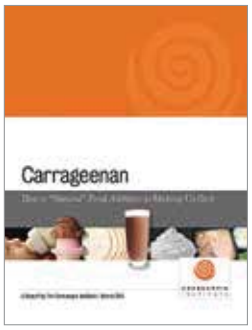

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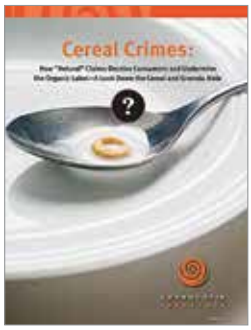

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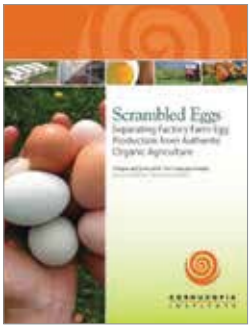

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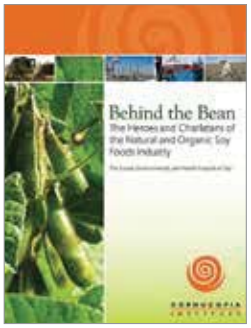

Behind the Bean. The Heroes and Charlatans of the Natural and Organic Soy Foods Industry

CORNUCOPIA INSTITUTE

THE CORNUCOPIA INSTITUTE is engaged in research and educational activities supporting the ecological principles and economic wisdom underlying sustainable and organic agriculture. Through research and investigations on agricultural and food issues, The Cornucopia Institute provides needed information to family farmers, consumers, stakeholders involved in the good food movement, and the media.

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