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National Organic Standards Board
USDA-AMS-NOP
1400 Independence Ave. SW.,
Room 2648-S, Mail Stop 0268
Washington, DC 20250-0268

Docket ID # AMS-NOP-21-0087

Re. MS: Distilled Tall Oil Discussion Document

These comments to the National Organic Standards Board (NOSB) on its Spring 2022 agenda are submitted on behalf of Beyond Pesticides. Founded in 1981 as a national, grassroots, membership organization that represents community-based organizations and a range of people seeking to bridge the interests of consumers, farmers, and farmworkers, Beyond Pesticides advances improved protections from pesticides and alternative pest management strategies that reduce or eliminate a reliance on pesticides. Our membership and network span the 50 states and the world.

This petition is for the use of distilled tall oil as a so-called "inert" ingredient in organic crop and livestock production. Although it would do something that we have argued needs to be done—evaluate a potential "inert" ingredient on its own merits—to do so without the framework for addressing all "inerts" will introduce chaos into the approval of products for use in organic production. These comments will address first the policy elements, then the specific issues around tall oil itself.

"Inerts" in general

One of the most egregious failures of the National Organic Program (NOP) has been its repeated lack of action on so-called "inert" ingredients. Because of that failure, every sunset brings to a new NOSB a listing that has not been changed in response to over a decade of NOSB recommendations. EPA has long since (2006) stopped updating the "inerts" lists to which the regulations refer. The NOSB, which has been recommending since 2007 the review of individual "inert" ingredients, has instead been given the option of relisting the outdated lists. The history of "inerts" in organic production was reviewed at length in our 2017 report "'Inert' Ingredients in Organic Production."[1] Nothing much has changed in the five years since it was written, except that the public and NOSB have continued to express frustration with NOP's failure to act.

NOP now says that an advance notice of proposed rulemaking (ANPR) on "inerts" is pending. Unfortunately, we have heard this before—such as in response to the Fall 2012 NOSB meeting, when NOP said it intended to conduct a public notification and comment process, including notification to the public of "inert" ingredients known to be used in organic production and NOSB's review plan, and a request for public comments regarding any other "inert" ingredients currently used in organic production that were not identified in the list provided by the NOP. It said that changes to the National List would be considered after NOSB completion of "inerts" review. Then, at the Spring 2013 meeting, NOP reiterated its intentions as stated in its response to the Fall 2012 meeting and said that a *Federal Register* notice to this effect was in review. At the Spring 2014 meeting, we heard that public notice of collaboration with EPA will be given in the *Federal Register*. This all followed years of NOSB research work, the development of review plan, and a unanimous Board recommendation—all done in coordination with the U.S. Environmental Protection Agency (EPA). With this history, **the NOSB should not base any decisions on such a "pending ANPR."**

Why do "inerts" matter?

The largest part of a pesticide formulation generally consists of "inert" ingredients – often more than 90%. People may be exposed to these chemicals through their own use of pesticides, use on food they eat, their neighbors' use, or use in public or workplaces. Since "active" ingredients are identified on the label, people can get information about the impacts of those chemicals on themselves, their children, their pets, and the environment. However, informed decision making at the personal and community levels about all the ingredients in a pesticide product is not possible. The "inerts" that are currently required by EPA to be disclosed are the most toxic–which have been mostly phased out by manufacturers–and the least toxic, in products that do not need to be registered. Most "inert" ingredients fell into the former List 3, "inerts of unknown toxicity," which, along with those formerly on Lists 2 and 4B (and some on 4A) are not listed on pesticide labels. While these have been assessed for the purpose of tolerance setting, many are known to be toxic. Many are still used as "active" ingredients in other pesticide products.

Because "inert" ingredients are secret, or non-disclosed, ingredients, it is not acceptable to approve them for use in organic production substances—like tall oil—outside of a framework that includes full disclosure of all input ingredients.

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1 https://www.beyondpesticides.org/assets/media/documents/Inert%20Ingredients%20in%20Organic%20Production.FULLreport.final.pdf.

Distilled tall oil

Composition

The composition of tall oil is not well-defined. The 2021 TR states, "Tall oil (both crude and distilled) has been classified as a substance of Unknown or Variable Composition, Complex Reaction Products or Biological Materials (UVCB) (HC 2019)."[2] It gives this table:[3]

Table 1. Typical composition of crude and distilled tall oil

78 **Category of compounds**	**Crude tall oil**	**Distilled tall oil**
Fatty acids	30-68%	17-70%
Rosin acids	26-60%	25-77%
Neutrals	5-38%	1.9-19%

It states, "Neutrals may include a wide range of chemical compounds, although alkanes (hydrocarbons), steroid-type compounds, ketones, aldehydes, alcohols, mercaptans, and salts have all been found within the neutral class of substances in tall oil."[4]

Environmental effects

Although the TR states that the authors were unable to find much documentation of environmental effects, it does identify some.

> Distilled tall oil disrupts cellular respiration by suffocation (Cousin 1987, Xie and Isman 1995, Brogán et al. 2006, USDA 2019, Wan and Wang 2020, USDA 2021). When soft-bodied insects are coated with distilled tall oil the transport of oxygen and other metabolites across the cellular membrane is disrupted, causing cell death in the insect (Brogán et al. 2006). The application of oils to insects may also disrupt cellular membranes and rupture cells (Brogán et al. 2006). However, Xie and Isman have reported that distilled tall oil is more potent than other oil-based pesticides, suggesting that distilled tall oil may have additional, chemically based toxicity when applied to the aphid *Myzus persicae* (Xie and Isman 1995).[5]

We are in the midst of a global extinction event to which the collapse of insect populations (the "insect apocalypse") contributes. The impact of this so-called "inert" ingredient on insects, especially nontarget insects that may form an important part of food webs, must not be discounted.

The TR also points to impacts on soils, earthworms, and aquatic organisms: It may accumulate in soils, acidify soils, react with limestone, lime, ash, biochar. It may chelate micronutrient metals, reducing their bioavailability.[6] "According to the EPA Ecological Structure-

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[2] 2021 TR lines 69-70.
[3] 2021 TR lines 77-80.
[4] 2021 TR lines 115-117.
[5] 2021 TR lines 232-238.
[6] 2021 TR lines 560-576.

Activity Relationship Model (ECOSAR), distilled tall oil is moderately toxic to earthworms, with a LC50 = 140 ppm (EPA ECOSAR)."[7] It is highly toxic to fish and other aquatic organisms.[8]

The manufacture of tall oil also presents threats to the environment. "Distilled tall oil is a byproduct of the paper industry. Environmental contamination and degradation is possible in the logging of forests required to produce distilled tall oil and other products derived from the Kraft process. Forests are important in fighting climate change through natural carbon sequestration, stabilizes soil and watershed systems, and provide habitat for biological diversity. In addition to the loss of carbon sequestration, deforestation contributes to 15% of global greenhouse emissions."[9] Sulfuric acid and hydrogen sulfide are produced in the manufacturing process and can present hazards if release.[10]

Tall oil is not essential for organic production.

The TR identifies these alternative materials:

> Alternative nonsynthetic sources of fatty acids, as an alternative to those in distilled tall oil, include vegetable oil, soybean oil, canola oil, corn oil, cottonseed oil, fish oil, jojoba oil, neem oil, and sesame oil. The similar chemical composition of these substances to one of the major class of compounds in distilled tall oil would result in similar solution polarity and surfactant properties. These compounds are likely to provide for similar sticker, anti-leaching, and time release characteristics as distilled tall oil. However, these substances are unlikely to have the same viscosity as distilled tall oil due to the absence of more viscous rosin acids.
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> Other natural oils provide similar hydrophobic properties to distilled tall oil and the alternative nonsynthetic sources listed above, including anise oil, citronella oil, clove oil, bergamot oil, linseed oil, lemongrass oil, mint oil, and thyme oil. Additionally, the narrow-range dormant, suffocating, and summer oils offer nonpolar synthetic alternatives that have been approved for organic use in 7 CFR 205. These compounds are likely to solubilize nonpolar compounds, although they are unlikely to solubilize the same range of compounds as distilled tall oil due to the absence of carboxylic acid groups. The nonpolar nature of these compounds is also likely to provide similar action as stickers, anti-leaching, and time release agents. These substances are unlikely to have the same viscosity as distilled tall oil due to the absence of more viscous rosin acids.
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> Pine rosins provide a nonsynthetic source of rosin acids. Like the natural sources of fatty acids listed above, pine rosins provide a chemical composition similar to one of the major classes of compounds in distilled tall oil and are likely to provide similar solution polarity and surfactant properties. These compounds are likely to provide for similar sticker, anti-leaching, and time release characteristics as distilled tall oil. However, these

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[7] 2021 TR lines 596-597.
[8] 2021 TR lines 501-520.
[9] 2021 TR lines 532-537. Here and elsewhere, internal citations are omitted.
[10] 2021 TR lines 539-552.

substances are unlikely to have the same viscosity as distilled tall oil due to the absence of less viscous fatty acids.

A natural alternative to distilled tall oil may be created by the combination of natural fatty acids with natural rosin acids. These substances could be mixed at differing ratios to provide optimal solvent properties for each specific application. Natural gums may also be added to natural fatty acids and both natural and synthetic oils to adjust viscosity. Gums offer viscous mixtures of polysaccharides that may serve as thickeners. Additionally, the increased polarity of these mixtures could be used to adjust solvent properties based on individual applications.[11]

The TR identifies these alternative practices:

There are a variety of alternative practices that would make the use of distilled tall oil unnecessary, such as the adoption of physical nets and barriers to protect from insect infestation. Nets and other physical barriers are effective against pests such as beetles and leafminers without any negative environmental effects. However, physical barriers are not effective against all insects, and may not be applicable to all settings and types of crops. Additionally, nets may be costly, making such methods impractical and difficult to scale up in large agricultural settings.

In some cases, mechanical removal of insects is a possible alternative to pesticides. Mechanical removal can take many forms including by hand, agricultural tools (e.g., skewers, etc.), and water streams. This is a desirable alternative due to the lack of environmental consequences and low technology requirements. Mechanical removal is also more effective against larger insects, such as beetles, hornworms, and cutworms. However, this alternative is not suited to all agricultural applications. Manual removal can be time consuming, labor-intensive and expensive, making it difficult to scale up to large agricultural applications.

Insects can also be reduced by agroecosystem management designed to prevent the growth of insect populations by weeding, crop irrigation, fertilization, or mulching. Such approaches produce more robust crops that are better suited to withstand pest infestations. The removal of weeds eliminates a potential habitat to harbor pest communities. Crop rotation and seasonal planting contribute to more robust plants by fostering healthy soil systems. Seasonal crop planting can also prevent pest infestations by strategically planting crops that are most resistant to seasonal pest populations.

There are also alternatives to the anti-leaching and time release applications of distilled tall oil. Alternatives include the adoption of soil amendments, utilizing ash, biochar, humates, clay, or lignin sulfonate. These substances improve the holding capacity of nutrients and other agricultural formulations due to their abilities to act as natural

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[11] 2021 TR lines 639-669.

chelates, thereby preventing pesticides, fertilizers, and micronutrients from leaching into water systems.[12]

Tall oil is not compatible with organic production.

Tall oil, when used as an "inert" ingredient is an undisclosed component of a product, which may have detrimental effects on the agroecosystem. Because NOP has not devised a system for evaluating "inert" ingredients and ensuring that organic producers have information about the products in which they are found, there is no way for growers and certifiers to verify that the products are being used in a way that protects the organic farm.

The Materials Subcommittee has posed these questions.

1. Does distilled tall oil as an inert ingredient provide functionality that could be beneficial to organic producers? Could that vary between usage in crop production versus livestock production?

The functionality of distilled tall oil is not transparent to the organic crop or livestock producer because "inert" ingredients are not disclosed on product labels. Until NOP develops a system for evaluating "inerts" and disclosing them to organic producers using the products, there is no way for the user to know whether it is present or at what level. A producer, therefore, cannot evaluate the functionality of tall oil as an "inert" ingredient and make an informed judgement on input use.

2. As the petitioner suggests, are there no other, or few other, time-release agents available for use in organic production?

The TR identifies alternative time-release agents: "There are also alternatives to the anti-leaching and time release applications of distilled tall oil. Alternatives include the adoption of soil amendments, utilizing ash, biochar, humates, clay, or lignin sulfonate. These substances improve the holding capacity of nutrients and other agricultural formulations due to their abilities to act as natural chelates, thereby preventing pesticides, fertilizers, and micronutrients from leaching into water systems."[13]

3. The regulation wherein the EPA classifies DTO as a List 3 inert is obsolete; however, according to the technical report, the rate of application for the substance as outlined in the petition could function more like an active pesticide, not an inert or adjuvant. Does the projected rate of application contribute to the substance functioning as an inert or active ingredient? Should the NOSB develop an annotation limiting the application rate of inerts and adjuvants so as to ensure they function as such and not as an active ingredients or pesticides?

So-called "inert" ingredients often comprise most of a pesticide product—frequently more that 90%. The application rate can thus not be used to determine whether a substance is "active" or "inert." This is why we ask that all substances be evaluated on an equal basis.

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[12] 2021 TR lines 674-701.

[13] 2021 TR lines 697-701.

4. Can DTO as an inert function as an active insecticide, making it fall outside the scope of this petition?

Clearly, from the information presented above and in greater detail in the TR, tall oil does function as an insecticide. However, there is nothing inert about "inert" ingredients because they can be chemically and biologically active. The distinction between "active" and "inert" is not useful, particularly within organic systems. Therefore, all substances applied in an organic system should be evaluated. Need can be judged according to function.

Thank you for your consideration of these comments.

Sincerely,

Terry Shistar, Ph.D.
Board of Directors