**National Organic Standards Board**
**Crops Subcommittee Petitioned Material Discussion Document**
**Paper (Plant Pots and Other Crop Production Aids)**
**August 15, 2019**

**Summary of Petition and Petition Addendum for Paper (Plant Pots and Containers):**

The NOSB received a petition in August 2018 for the addition of paper planting pots to the National List: **§205.601(o) As production aids. Plant pot or growing container—hemp or other paper, without glossy or colored inks.**

This material has not been petitioned for inclusion on the National List in the past; however, paper chain pots have been historically allowed for the past 12 years by some organic certification agencies under the allowance for "Newspaper or Other Recycled Paper" as a mulch or compost feedstock.

In February 2018, the NOP notified all certifiers that paper chain pots are not allowed in organic systems; however, because some certifiers had previously approved their use, NOP allowed a phase-out period until the end of the 2018 crop season. The NOP's decision on this material was based primarily on the fact that paper (a synthetic substance) is not included on the National List for uses other than as mulch and as compost feedstock. The paper chain pots also contain other synthetic substances, such as adhesives. At the October 2018 and April 2019 NOSB meetings, there were numerous oral and written public comments requesting a longer time period for allowing these paper pots while the NOSB reviewed the petition. The NOSB also formally requested this extension of the NOP in November 2018, the NOP agreed to allow the use of paper pots in organic agriculture in late fall 2018, with no time restriction, in order to give the NOSB time to review this material.

Paper pots are used by small and mid-scale farming operations to efficiently transplant vegetable seedlings. More information on this transplanting method can be found on these websites: http://paper-pot.com/ and http://www.smallfarmworks.com/. The transplanting equipment and paper pot chains are imported from a manufacturer in Japan. According to the petition, the Nitten paper chain pot system uses paper produced from a non-bleached Kraft pulp, and adhesives. There have been synthetic polymers (also called "synthetic fibers" in this document) in small quantities in the paper pots, but experiments are taking place to determine if these can be replaced by a natural hemp fiber. The petitioner and public comment at the Spring and Fall 2018 NOSB meetings stated this system is unique and essential for growers. The alternative would be the much slower and more costly method of hand planting individual seedlings. The system is used for closely spaced crops such as onions, beets, baby salad, etc. The petition states that similar to newspaper, these pots decompose readily in the soil.

In addition to the Nitten petitioner, there are numerous other paper pot systems, both to be transplanted as single plants and in chains of pots. These other paper pot systems have various proportions of synthetic polymer fibers as well as other ingredients, such as cow manure. The subcommittee seeks to address all these products in our recommendation.

The petition states that in addition to information on paper, the 2017 Technical Report (TR) on newspaper and other recycled paper addresses the presence of adhesives in recycled paper as well. The three adhesives in the Nitten paper chain pots are vinyl-acetate resin (water soluble and stated to be leached from the pots before transplanting), ethylene-vinyl-acetate resin, and acrylic acid ester copolymer.

The crops subcommittee has seen paper pots, used as a crop production aid, as another use of paper beyond compost feedstocks and mulch, which are allowed under the NOP regulation; however, in order to conduct this review, the crops subcommittee requested a July 2019 Technical Report on Paper Pots and Containers to determine the extent of synthetic adhesives, synthetic polymer fibers, and other additives in paper pots and to determine whether or not they are substantively different than those found in paper already allowed as mulch and compost feedstocks (§§ 205.601(b) and 205.601(c)). Pots, compost, and mulch all degrade into the soil, and the crops subcommittee believes if the fibers and additives are allowed in the other listings for paper, then their use in pots should be allowed as well. However, since the subcommittee is proposing allowing the use of virgin paper, the subcommittee wants to make sure that the annotation does not allow for that virgin paper to include any amount or type of synthetic polymer and that those synthetic polymers used in the virgin paper are biobased and biodegrade in the soil.

The Technical Review clarified that the additives and synthetic fibers found in a variety of paper pots are also found in newspaper and other recycled paper currently allowed for compost feedstock and mulch. Other possible additives and synthetic fibers for paper pots that were not mentioned in the petition are described in the TR.

**Summary of Public Comment:**

Many users of the paper chain pot system provided written and verbal comment to the NOSB at the fall 2018 and spring 2019 meetings. They spoke in favor of its use due to its efficiency in transplanting, particularly in smaller scale production systems. Some certifiers spoke in favor of this material and noted that if the paper was torn off the pot before transplanting, it would then be allowed as a mulch or as a compost feedstock under the current regulation. Certifiers who had not previously allowed the use of these paper pots still supported the extended allowance for use while the NOSB performed its review.

There is more than one supplier of paper pots beyond the Nitten supplier noted in the petition. Approval of this material will likely lead to other manufacturers competing for their share of this market. Synthetic paper pots can be made from natural fiber feedstock or from a mixture of natural fiber feedstock and synthetic polymers. The pots with synthetic polymers are more typically used in the nursery trade where perennial plants may be in the pots for 9-12 months before transplanting into the field. Natural fiber pots are, at times, used in transplanting annual vegetable and floriculture seedlings, depending on the time frame between planting into the pot and planting out in the field and whether the pots need extra strength for a “chain of pots” planting system. All of the paper pots contain some type of synthetic adhesive, but these same adhesives are also found in the recycled paper already allowed in organic agriculture.

Numerous commenters mentioned that all uses of paper as a production aid should be included when the NOSB does its review for paper pots. Cloches or hot caps, seed tape, and cutworm prevention collars are other examples of production aids made from paper and typical paper adhesives that would decompose in the soil.

**Specific Uses of the Substance:**

Paper-chain pots are either single or in chains to allow for “mechanical” transplanting. The paper pots decompose in the soil and lessen transplant shock since the seedling root system is less disturbed, and the paper pots are part of a greenhouse-to-field growing system that requires considerably less labor

than hand transplanting. Use of paper pots may significantly reduce reliance on plastics. Growers can also use soil blocks, which are compressed soil without any container, to grow transplants.

Other paper crop production aids include: cloches, a temporary covering used to protect newly transplanted plants, seed tape on which individual seed is spaced correctly on a paper tape which lessens the need for thinning, and collars to prevent cutworm damage to plants at the soil line. There could be other uses of paper currently used as crop production aids, or there may be other uses developed over time.

**Approved Legal Uses of the Substance:**

Newspaper and recycled paper are allowed under the organic regulations in these two references:

**Reference:** 205.601(b) As herbicides, weed barriers, as applicable. (2) Mulches. (i) Newspapers or other recycled paper, without glossy or colored inks.
**Reference:** 205.601(c) As compost feedstocks—Newspapers or other recycled paper, without glossy or colored inks.

There have been two technical reports (TRs) on Newspaper and Other Recycled Paper in 2006 and 2017, which can be found here: https://www.ams.usda.gov/rules-regulations/organic/national-list/n.

NOP guidance 5034-1 "Materials for Organic Crop Production" from December 2016 excludes virgin paper from the "newspaper or other recycled paper" allowance for mulch or compost feed stocks. The guidance states: *"Includes newspaper and other recycled paper such as cardboard, without glossy or colored inks. Does not include paper that is not recycled (i.e., virgin paper)."*

The July 2019 Technical Report of Paper Pots and Containers, which detailed the specific possible synthetic and natural fibers as well as synthetic adhesives found in paper pots currently commercially available, provided more clarity about manufacture and use of paper pots for the NOSB.

**Manufacture:**

Paper can be made from various plant sources including wood, trees, straw, hemp, bamboo, reeds, kenaf, sisal, jute, sugarcane bagasse, sunflower stalks, and as recycled sources of pulp. Cellulose sources are typically mechanically ground and then chemically "cooked" using an alkali or sulfite process. Newspaper and recycled papers can also have a variety of inks, although colored ink and glossy paper are not allowed as compost feedstocks or mulch. Paper used as a production aid could include the typical adhesives found in newspaper and recycled paper.

**Subcommittee Discussion:**

The crops subcommittee has reviewed the petition, technical reviews, and public comments and has developed a listing and annotation that we believe meets the needs of producers, while addressing environmental concerns that might be associated with some types of paper. When discussing the possible allowance for paper used as a production aid, the subcommittee also considered the fact that we currently have an allowance for paper used in organic production. It is the subcommittee's view that there are few differences between the current paper allowance and the use of paper for plant pots and containers.

**Category 1: Classification**

1. **For CROP use: Is the substance _____ Non-synthetic or __x__ Synthetic?**
   *Is the substance formulated or manufactured by a process that chemically changes a substance extracted from naturally occurring plant, animal, or mineral sources? [OFPA §6502(21)] If so, describe, using NOP 5033-1 as a guide.*

   The paper pulp production process and the adhesives used in maintaining structural integrity of the paper pots currently rely on synthetically manufactured ingredients.

2. **For CROPS: Reference to appropriate OFPA category:**
   *Is the substance used in production, and does it contain an active synthetic ingredient in the following categories: [§6517(c)(1)(B)(i)]; copper and sulfur compounds; toxins derived from bacteria; pheromones, soaps, horticultural oils, fish emulsions, treated seed, vitamins and minerals; livestock parasiticides and medicines and production aids including netting, tree wraps and seals, insect traps, sticky barriers, row covers, and equipment cleansers; or (ii) is used in production and contains synthetic inert ingredients that are not classified by the Administrator of the Environmental Protection Agency as inerts of toxicological concern?*

   This material is a crop production aid, not a pesticide.

**Category 2: Adverse Impacts**

1. **What is the potential for the substance to have detrimental chemical interactions with other materials used in organic farming systems? [§6518(m)(1)]**

   Paper for plant pots/containers (as a crop production aid) is functionally identical to newspaper and recycled paper. This current listing of newspaper and recycled paper has been found to have no detrimental interactions with other materials in organic agriculture. Since virgin paper, with potentially different synthetic polymer makeup than recycled paper, would be allowed under this listing, a biodegradability standard in the annotation ensures that these paper products would not persist in the environment.

2. **What is the toxicity and mode of action of the substance and of its breakdown products or any contaminants, and their persistence and areas of concentration in the environment? [§6518(m)(2)]**

   No toxicity or negative mode of action has been found in the breakdown of paper (cellulose) in the environment. No colored or glossy inks would be allowed for paper as a crop production aid, which would be aligned with the current annotation for paper as a compost feedstock and/or mulch. The 2019 TR found many of the adhesives and synthetic fibers biodegrade with no negative impacts. There were some that were not as environmentally neutral as others, but all are also present in paper under the current allowance. The subcommittee wants to ensure that the fibers used in paper products described by this petition will similarly biodegrade in the soil, especially given that virgin paper, with potentially different quantities of synthetic polymers than recycled paper, would be allowed.

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

There could be contaminants released into the environment during the manufacture of paper and environmental degradation caused by harvest of cellulose, but no more than newspaper or recycled paper. A difference between this paper and the previously approved newspaper and other recycled paper is that we are not restricting it to the use of only recycled paper products. The annotation will allow virgin stocks of cellulose to be used in the paper used as a production aid in organic agriculture. There are negative environmental impacts from harvesting trees to make paper such as deforestation, road building, soil erosion, and degraded water quality, but there are forestry best management practices that can help mitigate some these negative effects.

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

   The 2019 TR did not find any evidence of harmful effects to human health.

5. **Discuss any effects the substance may have on biological and chemical interactions in the agroecosystem, including the physiological effects of the substance on soil organisms (including the salt index and solubility of the soil), crops and livestock. [§6518(m)(5)]**

   Paper, as a material, is not harmful to the environment. The 2019 TR did not find any evidence of harmful effects to environmental health.

6. **Are there any adverse impacts on biodiversity? (§205.200)**

   No.

**Category 3: Alternatives/Compatibility**

1. **Are there alternatives to using the substance? Evaluate alternative practices as well as non-synthetic and synthetic available materials. [§6518(m)(6)]**

   There are biodegradable pots made from composted cow manure, but these have never been petitioned for use in organic agriculture. We do not know if they could be approved or not. These pots contain 10% newspaper. There are also tools to help growers roll up newspaper into a pot. The paper chain pots offer greater efficiency for transplanting, although mechanical or hand transplanting operations can be used in both small- and large-scale operations with other types of containers. The future use of hemp fibers may also offer an alternative to synthetic polymers.

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

   The crops subcommittee has developed the annotation "Virgin or recycled paper, without colored or glossy inks; any synthetic fibers included must not exceed 15% of the paper and must be 100% biobased with content determined using ASTM D6866 (incorporated by reference; see 205.3), and demonstrates at least 90% biodegradation absolute or relative to microcrystalline cellulose in less than two years, in soil, according to one of the following test methods: ISO 17556 or ASTM D5988 (both incorporated by reference; see § 205.3)". Continuing the prohibition on

colored and glossy inks prevents the incorporation into organic soil of the worst contaminants. Allowing the adhesives typically used in paper, makes this crop production aid equivalent to newspaper and recycled paper that is currently allowed. The allowance for virgin paper allows for special papers to be developed that meet the specific crop production needs for a variety of uses, and the amount of paper produced from virgin sources for these production aids would be very small compared to the amount of paper manufactured for all uses. Added fungicides, insecticides, or other synthetic materials not typically found in paper, would not be allowed under the current annotation. An unanswered question is whether it is practical and achievable to allow only natural fibers, using hemp or other fibers, to provide the strength needed in paper crop production aids. With the recommended annotation, paper as a crop production aid is compatible with a sustainable system of agriculture.

**Discussion Questions:**

1. Please comment on the following options under consideration by the subcommittee for listing at § 205.601(o) as production aids:
    a. "Virgin or recycled paper, without colored or glossy inks," or
    b. "Virgin or recycled paper, without colored or glossy inks; any synthetic polymer fibers included must not exceed 15% of the paper and must be 100% biobased with content determined using ASTM D6866 (incorporated by reference; see 205.3), and demonstrates at least 90% biodegradation absolute or relative to microcrystalline cellulose in less than two years, in soil, according to one of the following test methods: ISO 17556 or ASTM D5988 (both incorporated by reference; see § 205.3)"
2. Synthetic polymer content—
    a. Should a maximum synthetic polymer content be stated explicitly? If so, what is the appropriate level?
    b. What is the amount (or range) of synthetic polymer content in products currently available?
    c. How would synthetic content be measured? How would a certifier or Material Review Organization verify content? For example, if a product included recycled paper as an ingredient, how would the synthetic polymer content be determined?
    d. Is it possible to manufacture paper production aids that use only natural fiber sources and that meet the product specifications for their intended use?
3. Biodegradability—
    a. Should a biodegradability standard be included for these products? If so, is this the appropriate biodegradability standard?
    b. Does maximum synthetic polymer content need to be stated if there is a biodegradability requirement?
    c. As the products biodegrade, what is the impact on the soil? Also, can fragments be consumed by wildlife or livestock before it is completely degraded?
4. Biobased content—
    a. Should a minimum biobased content standard be included for these products?
    b. Is 100% biobased content achievable for these products? If not, what should be the minimum biobased content requirement?
5. Is genetic engineering involved in the production of these products?
6. Does the annotation need to specify that added fungicides, insecticides, or other synthetic materials not typically found in paper would not be allowed, or is that already understood?

**Subcommittee Vote:**

Motion to accept the petitioned material discussion document on Paper (Plant Pots and Other Crop Production Aids)
Motion by: Harriet Behar
Seconded by: Steve Ela
Yes: 8 No: 0 Abstain: 0 Absent: 0 Recuse: 0

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