



Treated Wood on Organic Farms

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Wood has many uses on the farm, including raised beds, fencing, greenhouse framing and storage buildings. However, some lumber suitable for these applications is chemically treated and this “treated” wood may not be allowed in organic production. Other treated wood products are available but not explicitly addressed in the organic standards. This factsheet discusses treated wood, the relevant organic rules and the available alternatives.

What is treated wood?

Wood is a natural and biodegradable material that can rot or be attacked by insects when used in humid or exterior applications on the farm such as fencing, raised beds, trellis systems, or greenhouse framing. Wood in contact with the ground is especially susceptible to decay. Preservative chemicals are often added to wood to protect it from decay and insects and thus increase its lifespan. In order to effectively protect wood, the preservative chemicals must be forced deep into it. This process is accomplished using cycles of vacuum and pressure, and the finished product is commonly called pressure-treated wood. Water repellents or topical (brushed-on or dipped) paints or preservatives will not effectively protect wood in exterior applications.

The most common and effective preservatives used for pressure treating wood are oil-based creosote; pentachlorophenol (PCP); and water-based, copper-containing mixtures. Creosote and PCP treatments are oily and dark in color and are used for railway ties and utility

poles. Water-based copper-treated wood is lighter-colored, clean to the touch and is the most widely available and commonly used wood for agricultural and residential settings.

Chromated copper arsenate is one example of a water-based, copper containing wood preservative. CCA was used very commonly for residential and agriculture applications for many years. However, in 2003, the chemical suppliers withdrew the registration for the use of CCA in residential applications (e.g., decking). CCA and other arsenic-containing preservatives such as ammoniacal copper zinc arsenate (ACZA) are still used for utilities and commercial and agricultural products such as fencing. To replace CCA-treated products, wood treatments without arsenic were developed, like water-based alkaline copper quaternary (ACQ) and copper azole (CA). These products contain copper and nonmetallic biocides but no arsenic or chromium.

What are the organic rules?

The National Organic Program rule 205.206 (f) states: “The producer must not use lumber treated with arsenate or other prohibited materials for new installations or replacement purposes in contact with an organic production site.” (See “Uncertainty in the rule,” below, for discussion about acceptability of ACQ and CA treatments within NOP 205.206.) This rule essentially means that any new construction, repair or other farm use cannot be made with arsenic-treated wood if it is used directly in organic

production, e.g., for the frames of a planting bed or boards of a farrowing house. Such treated wood may be allowed in fences or structures if they are isolated from organic production areas. To be considered isolated means it cannot come into contact with anything used in the production process, such as soil, compost, fertilizer, produce, livestock or livestock feed.

Organic farmers are unlikely to have the option to consider creosote- or pentachlorophenol-treated wood, which are used only for industrial products such as railway ties and utility poles. The only exception is that used creosote-treated railway ties are sometimes recycled for use as landscaping timbers; the NOP rule prohibits this use for organic farms.

Exceptions to the rule:

There are special situations where otherwise-prohibited treated lumber may be permissible, following provisions that there is no contact between treated wood and soil, livestock or organic product. For instance, if a greenhouse is at least 20 feet from organic fields and you are not planting in the ground in the greenhouse, treated wood may be allowed for its framing. You can plant on greenhouse benches in flats or pots, as long as the organic product does not come in contact with the treated wood. Physical barriers that prevent contact of treated wood with soil, livestock or organic product may be approved if the certifying agent determines it is sufficient to protect crops, soil and animals long-term. For instance, since the metals that may leach from the treated lumber do not travel long distances, a buffer zone of 10 to 20 feet between a treated fence and crop should be sufficient to prevent contamination. Other types of buffers include mowed grass ways, diverted crops, trees and wooded areas, hedges, and tall perennial grasses. Another example of a physical barrier is using plastic to cover treated benches in a greenhouse, or wrapping posts with plastic so the treated wood does not contact the soil.

Soil contamination from treated wood is highest the first year it is exposed to rain and environmental factors. Because of this, the NOP has made an allowance that pre-existing treated wood may be “grandfathered in” provided it was not applied within three years of the first organic harvest date. Despite this exception, if the certifying agent detects a situation where pre-existing treated wood presents a significant contamination risk, you will be required to remove or mitigate the risk before certification can be granted.

It also should be noted that even though a fence, building or trellis on your farm has been grandfathered in, if that structure needs repair, treated wood cannot be used. Also, reusing otherwise-prohibited treated wood from a grandfathered in structure to use elsewhere on the farm is not permitted. For example, you cannot use a prohibited-treatment post from a grandfathered in fence to replace a post in your orchard.

Uncertainty in the rule:

While the treated wood rule is straightforward with respect to treated wood that contains arsenic, penta or creosote, it is unclear whether other wood treatments are allowed. Copper-based preservatives like ACQ and CA treatments are synthetic and the organic standards accept synthetics only when “there are no organic substitutes.” On the other hand, there are few treated-wood alternatives that do not contain copper, and copper compounds are specifically allowed provided that they are “used in a manner that minimizes accumulation in the soil and shall not be used as herbicides” (for “plant disease prevention”; NOP 205.601(i)(2)). Copper in treated wood is used to prevent fungal and insect attack of the wood and the limited available data on the movement of copper from treated wood suggests that the accumulation of copper in soil or plants near treated wood is low (Cooper et al., 1995; Cooper and Ung, 1992).

Because the NOP rule is not explicitly clear on treated wood alternatives, much of what is and is not allowed is determined by how the certifying agency interprets the organic standards. So, when dealing with treated wood on your farm, contact your certifying agency with any questions or concerns prior to the purchase of materials and construction. Also, any procedure you have in place for protecting your organic product from treated wood should be clearly described in your organic system plan along with detailed documentation of your actions.

What are alternatives to treated wood?

Despite the regulatory uncertainty regarding the use of some treated wood products on organic farms, some growers will prefer to avoid all types of treated wood when possible. There are a number of potential options, including naturally durable wood or untreated wood, plastic, steel or concrete.

Naturally durable wood

Some tree species are naturally resistant to insect damage and moisture or decay. This durability is due to chemicals

that the tree deposits in the heartwood (the older dead wood in the center of tree) as it grows. It is important to note that only the heartwood of these species is durable and that the sapwood (the wood just beneath the bark) of all species is susceptible to rot and insect attack. Most species that are naturally resistant to decay have heartwood that is darker in color than the sapwood, which is generally white or tan. Redwood, black locust, white oak, black walnut, cypress and cedar are examples of species with naturally durable heartwood. These species are advantageous as they are a renewable resource and can remain rot resistant in the soil for more than 25 years. While ideal for most situations on the farm, they may be more expensive and difficult to source than treated wood.



Figure 1. Black walnut has naturally durable heartwood. The dark inner wood is the heartwood and the light outer ring is the sapwood.

Untreated, non-durable wood

Using untreated, non-durable wood is often the easiest and cheapest alternative to treated wood for many on-farm applications. Best uses for untreated wood are things like trellis systems and stakes. This option has the lowest durability and will last for only a few years when exposed to the soil or consistent wetting.

Steel, concrete and plastic

Steel and concrete are affordable and low-maintenance options for many on-farm uses. Steel posts can be used in vineyards; corrugated steel is used for barns and storage buildings; concrete blocks can be used for raised beds; and steel can be used for benching and shelving in greenhouses, storage and packinghouses. Also, plastic is a

versatile material that can replace treated wood for many uses on the farm. Common uses are compost bins and benching and shelving in greenhouses, storage and packinghouses.

While some treatments used to protect wood are specifically addressed in the NOP, there is no mention of protective or processing treatments for other materials such as steel, concrete or plastics. For example, the coating used for galvanized steel products to protect them in outdoor exposures is high in zinc. Like the copper used for treated wood products, the zinc is chemically combined with the product it is protecting, and thus it could be considered not to be one of the “synthetic substances allowed for use in organic crop production” (USDA NOP 205.601). However, like the copper used for treated wood products, zinc is a heavy metal that could in theory leach into the soil. Concrete and plastics also are produced with many synthetic additives that could be interpreted as unacceptable according to the NOP rule (USDA NOP 205.601).

Wood/plastic composite (WPC) is commonly available as decking and other lumber products. It is a mixture of mostly (untreated) wood flour and plastic. However, zinc-borate compounds may be added as a fungicide (to protect the wood component), and thus may not be approved for organic production. Like treated wood, WPC can be used in farm areas not directly involved in production, like decking and fencing.

There are many alternatives for treated wood in farm applications; however, be sure to check with your organic certifying agency before purchasing or using an alternative on the farm.

Additional resources on treated wood and potential alternatives:

Cooper, P., E. Jasonek and J. Aucoin 1995. Plant uptake of CCA components from contaminated soil. International Research Group on Wood Preservation.

Cooper, P. and Y. Ung 1992. Leaching of CCA-C from jack pine sapwood in compost. *Forest Products Journal* 42:57-59.

Gegner, L. 2002. Organic Alternatives to Treated Lumber. *Appropriate Technology Transfers for Rural Areas*. <http://www.scribd.com/doc/40730959/Organic-Alternatives-to-Treated-Lumber>

Hoffman, T., L. Hendricks and K. Powell 1995. Selecting Preservative Treated Wood. University of Minnesota Extension. <http://www.extension.umn.edu/distribution/housingandclothing/dk0897.html>

Madge, D. 2010. Organic Farming: Alternatives to Treated Vineyard Posts. Department of Primary Industries, Victoria, Australia. <http://www.dpi.vic.gov.au/agriculture/farming-management/organic-farming/organic-viticulture/alternatives-to-treated-vineyard-posts>

USDA 2013. National Organic Program Final Rule. Electronic Code of Federal Registry. http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&sid=3f34f4c22f9aa8e6d9864cc2683cea02&tpl=/ecfrbrowse/Title07/7cfr205_main_02.tpl.

USDA 2013. The National List of Allowed and Prohibited Substances. Electronic Code of Federal Registry. <http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&SID=8A253d4d426607559e96fa9a2dfb798&rgn=div8&view=text&node=7:3.1.1.9.32.7.354.2&idno=7>.

Wormell, L. 2011. Chromated Copper Arsenate. Environmental Protection Agency. <http://www.epa.gov/oppad001/reregistration/cca/>.

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