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PRESERVETECH

Guidance for properly specifying and using preserved wood products

Safe garden boxes using preserved wood

Raised bed gardens are popular throughout America. Many families enjoy growing fresh produce at home and raised bed gardening offers many advantages over simply planting in the ground.

Constructing garden boxes for raised beds is an easy do-it-yourself project, with materials such as preservative-treated wood readily available. Unfortunately, the Internet is filled with unsubstantiated cautions to avoid using preserved wood because of fears that the preservative will affect the produce.

Such fears are unwarranted. New research from Oregon State University shows that not only is preserved wood a practical choice for constructing garden boxes, but also the wood poses no risk to the plants and vegetables grown in the boxes.

The study compared plants grown in garden beds made from untreated and pressure-treated wood. Produce and leaves were tested over two growing seasons to determine if preservative was absorbed in the plants, affecting the vegetables and fruits.

Source of concern

Wood used for garden beds is subjected to insect and fungal attack, which over time can degrade the wood fiber. Preservative treating protects the wood from decay and insects, providing long life in demanding conditions.

Preserved wood available in retail locations today is treated with preservatives containing copper and other biocides. Copper, the chief component in these preservatives, is an effective deterrent to decay fungi and insects such as termites. The biocides used are at much lower concentrations than copper and are also found in consumer products including cleaners, disinfectants and medications.

Spurred by concerns voiced in online forums and posts, OSU researchers determined in 2021 to conduct a study aimed at answering two common questions about garden boxes constructed with preserved wood:

1. Does copper from preserved wood used in garden boxes migrate into the soil?
2. If the copper does move, do the fruits, vegetables and herbs grown in the raised beds absorb the copper?

Comparing garden boxes

The researchers used a home garden located in Oregon's Willamette Valley near the OSU campus. Four garden boxes were constructed: two using untreated Douglas fir lumber and two beds using Douglas fir lumber pressure treated with copper azole (CA-C) to ground contact specifications.

Each raised bed was 4 feet wide by 10 feet in length, constructed using nominal 2x12 lumber. The beds were filled with native soil found onsite and amended with compost. The beds were drip-irrigated as needed. Trellises used to support larger plants were constructed either with galvanized steel or untreated wood and did not contain copper.

The raised beds were planted with a variety of vegetables and herbs: arugula, basil, beets, carrots, lettuce, radishes, kale, parsnips, peas, peppers, tomatoes and turnips. Data covering two planting and growing seasons were collected and analyzed.

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Testing for copper

Copper from the preservative is present on the surface of treated wood as well as in its fiber. When the wood gets wet from rain and irrigation, small amounts of copper may move from the wood vertically down into the soil and laterally by diffusion through water in the soil matrix. For the study, researchers sought to determine the degree to which there was any horizontal spread of copper into the soil where roots of the plants were present.

Soil samples were collected from the center of each bed to serve as controls. As is true in most places, the soil in the Willamette Valley contains naturally occurring copper up to 140 parts per million or PPM.

To measure the spread of copper, samples were collected within 1 inch of the raised beds' wood frames, 3-4 inches away from the wood, and at the center of the beds. All four beds in the study were sampled in the same manner. Soil samples were tested at the beginning and end of each growing season.

Testing showed while some copper moved from the preserved wood, it was undetectable in the vegetables grown in the boxes. The produce from plants in the preserved wood garden boxes was indistinguishable from those grown in the untreated wood boxes.

The researchers also directly tested the vegetables and herbs to see if the plants absorbed copper. Different plant parts were tested depending on the plant. For example, root crops like carrots, beets and parsnips had the leaves and roots tested separately. The soil and the plants were tested in a laboratory using standard testing methods to determine the copper levels.

What researchers found

In short, copper increases in the soil were small and limited to the areas in direct contact with the pressure-treated wood or within 1 inch from the wood surface. There was no detectable increase in copper concentrations in any of the vegetables and herbs grown in the beds. Test results for copper levels in plants grown in the beds made with untreated lumber were indistinguishable from those of plants grown in beds made with preservative-treated lumber.

Copper concentrations in the soil sampled from within 1 inch of the wood in the preserved wood beds were slightly higher than other soil samples – at most 57 PPM, which is well within the range of the natural occurring copper in the soil. Soil samples taken from areas 3-4 inches away from the wood and those taken from the center of each bed showed no measurable differences in copper concentrations between samples taken from the treated and untreated beds.

Boxes constructed from untreated wood showed signs of decay after only one year of use. The preserved wood boxes had no evidence of deterioration when exposed to the exact same outdoor conditions.

Safe for vegetables

Gardeners can rest assured the plants, vegetables and herbs they grow in raised beds built with copper azole-treated lumber will not show increases in copper compared to vegetables grown in untreated beds.

In garden beds built with preserved wood, the degree to which preservative moves into the soil is minor and is limited to within about an inch of the preserved wood. Plants grown in beds built with the most commonly available preserved wood will not accumulate copper at levels higher than those from beds made from other materials. Using preservative-treated wood for raised bed gardening is an excellent way to save time, money and effort by constructing boxes that will last for many years.

For additional information on the garden box research, go to: ***https://wwpi.info/OSUGardenBox***