Gardening Basics

Raised Bed Materials

Materials used for the containers we grow plants in are important. Without careful consideration, all the benefits of growing vegetables can be undone - or worse - by using unsafe materials for raised beds.

Galvanized Steel Tanks for Planting Beds

There are many advantages to using galvanized steel containers for gardening. They come in a variety of sizes and often don't require assembly. Their standing height may make it easier to tend to the plants. Galvanization is a process that applies a zinc coating on steel to resist oxidation and prevent rust and corrosion.

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Using galvanized steel containers for growing vegetables is safe. That said, if you're re-using a salvaged galvanized container, it is critical to know the history of the container's use. **Do not use** it to grow edibles if it held herbicides, pesticides, fungicides, or petroleum products. All these considerations also apply to using galvanized corrugated metal for building raised beds.

Other Raised Bed Materials

Other materials commonly used to construct raised beds include wood, cement blocks, synthetic lumber, and composite wood products.

Wood

Because the wood is in contact with soil and water, it's important to use naturally decay-resistant or treated wood to build the bed. Decay-resistant types of wood include cedar, black cherry, oak (species: bur, chestnut, post, white), black locust, Osage orange, or redwood. (Source: USDA Forest Products Lab, Technical Note #229). Many types of chemical treatments are applied to wood to prevent insect attacks and fungal diseases. Many of these treatments, particularly in salvaged wood, are not safe in raised beds for growing edibles.

Toxic Chemical Wood Treatments

Chromated Copper Arsenate (CCA) was the primary treatment for wood material from 1970 to the early 2000s. Studies found that CCA-treated wood should not be used for raised beds because rainfall and solar radiation increased arsenic leaching from the wood. Fortunately, CCA-treated wood is no longer on the market.

Creosote is a patented wood preservative and is a mixture of 200-400 different compounds. It is a restricted pesticide primarily to treat railroad ties, utility poles, marine structures, and some bridge timbers. It has an objectionable odor and oily texture that can ruin apparel and footwear and cause sun sensitivity to exposed skin. And it may be carcinogenic. It is not permitted for interior use and **should not be used if it will contact food, feed, or drinking water.**

Pentachlorophenol (Penta) was developed in the 1930s and is now a restricted-use pesticide with no interior use. It is an oil-based preservative used on utility poles, fence posts, bridge timbers, foundation piling, and glue-laminated timbers. Penta is a potent biocide (a substance that destroys living things) that can cause skin irritation, plant damage, or plant death. Penta-treated wood **should not be used for raised bed construction.**

Safe Wood Preservation Methods

According to the University of Maryland Extension, there are several safe methods for preparing lumber to limit the damage caused by insects or fungus.

- Paint the wood with exterior latex paint to minimize soil contact with treated wood (Source: Oregon State Extension)
- Treat the wood with a semi-transparent oil-based stain (Source: USDA Forest Products Lab)
- Apply a heavy plastic liner between the treated wood frame and your garden soil, allowing for soil drainage (Source: Iowa State University and Massachusetts Department of Environmental Protection)

Alkaline Copper Quaternary (ACQ) treated wood has been available since the 1990s and is the most widely used preservative for residential applications today. ACQ does not contain arsenic but does contain copper. It is considered to have relatively low risks and is essentially non-toxic with normal skin or oral exposures. ACQ treated wood is not allowed in organic farming operations. Learn more about the health risks associated with ACQ-treated wood on the National Pesticide Information ACQ Information page: http://npic.orst.edu/ingred/ptype/treatwood/acq.html.

Cement Blocks and Poured Concrete

Brick, stone, and other masonry products are long-lasting but more expensive than wood for constructing raised beds. Cement, cinder, and concrete blocks are made with cement mixed with sand or small rocks. Fly ash, a by-product of burning coal, is often used to produce these blocks. Fly ash contains heavy metals and other hazardous materials. Typically, the product labels for these blocks do not list the types of aggregate used in their manufacture. The blocks can be sealed with polymer paint to reduce the risk of leaching toxins into the soil.

Poured concrete is another long-lasting (but more expensive) option for building raised beds. Verify that any curing compounds, stains, sealers, or release agents are safe in edible gardens.

Resources

"Building Raised Beds", IFAS Extension, University of Florida, (accessed 6 May 2025), https://gardeningsolutions.ifas.ufl.edu/design/types-of-gardens/building-raised-beds.html

Fritz, Vincent and Carl Rosen, "Raised bed gardens", 2018, University of Minnesota Extension, (accessed 6 May 2025), https://extension.umn.edu/planting-and-growing-guides/raised-bed-gardens

"Growing edible plants in galvanized containers", University of Washington, (accessed 6 May 2025), https://depts.washington.edu/hortlib/pal/growing-edible-plants-in-galvanized-containers/

"The Safety of Materials Used for Building Raised Beds", University of Maryland Extension, (accessed 6 May 2025), https://extension.umd.edu/resource/safety-materials-used-building-raised-beds

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