



Wood Preservation  
Canada

202 – 2141 Thurston Dr.  
Ottawa ON K1G 6C9  
613-737-4337



## **Bulletin: “Treated Wood in Raised Bed Gardening”**

September. 9, 2016 – John R. Harrison

### **Introduction**

Today many people grow herbs, vegetables, and other plants in garden boxes made from pressure treated wood. The garden boxes are filled with soil or potting soil and can be placed on lawns, patios, balconies, open porches or anywhere you have the space and the exposure to the sun.

### **Advantages of Raised Bed Gardening**

Advantages of raised bed gardening include higher yields, an expanded growing season, easy maintenance and the ability to use difficult sites. Rooftop gardens and raised beds built on solid rock are examples of the use of difficult sites.

Raised bed gardens improve water drainage in heavy soils or low areas. They are also useful for building up the height of a garden to be wheelchair accessible or for people who have difficulties bending and kneeling on the ground. Raised beds warm quickly in the early part of the year and then allow for earlier planting. Soil in raised beds can be improved by using proper aeration and using manure, composting materials or other water retaining material such as vermiculite. There are a number of other publications which provide more details on topics of design, soil mix and the maintenance of raised beds<sup>1</sup>.

### **Construction of Boxes**

A box with a minimum depth of 10-12 inches<sup>2</sup> is suggested for most types of plants that are commonly grown in these boxes and thus exposed to sun and wind.

Advantages of using pressure treated wood include its modest price, excellent workability, and the fact it lasts longer than untreated wood.

Before using pressure treated wood, check the tag on the end of the wood for the preservative used in pressure treatment and read the use and handling guidelines available at: <http://www.ptw-safetyinfo.ca/en/>.



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## Safety of Pressure Treated Wood Used in Raised Bed Gardens

The pressure treated wood available to consumers through home improvement centres and lumber yards for the construction of garden boxes uses one of three preservatives: alkaline copper quaternary compounds (ACQ), copper azole (CA) or micronized copper azole (MCA). All three wood preservatives have been carefully evaluated for safety and registered by the Health Canada Pest Management Regulatory Agency (PMRA) for use in residential construction.

PMRA uses a reasoned approach of using a risk assessment along with risk management options for a health assessment of any product under evaluation for registration. This is the Canadian approach to determining acceptable risk for the Canadian population for all consumer, therapeutic and pesticide products. Even at that, the Canadian government errs on the side of safety when calculating the possible health risks for Canadians from chemicals and other sources. In the end, the final choice of accepting a level of risk and therefore using or not using a product always falls to the consumer. This choice should be based on solid scientific evidence that is reviewed and assessed by experts and not on reports that appear to be inaccurately focused on inducing alarm.

Scientific evidence and data have shown that using pressure treated wood for raised bed or box gardening is safe to adults and children in terms of the plants grown and used in these containers.

Wood research scientists Love, Gardner and Morrell<sup>3</sup> at Oregon State University found that in growing radishes, carrots and potatoes for three months in a copper azole treated Douglas-fir planter, the copper levels were higher in the soil next to the treated wood but the copper levels did not differ in the roots or tubers grown in treated wood as compared to untreated wood. Copper levels were elevated in the carrot foliage but this is not normally eaten. They also state that when people are concerned about the migration of wood preservatives they can use polyethylene (plastic) to line the inside of the planter. Their scientific results indicate that although plastic lining is “not entirely necessary”, it can be used if there are safety concerns. The use of a plastic barrier will also extend the life of the preserved wood and help keep the raised bed garden soil within the bed area. For proper drainage, the plastic material should not be used underneath the raised bed garden.

Another health-based study by C.A. Cushing, R. Golden, Y.W. Lowney and S.E. Holm<sup>4</sup> published in the scientific journal *Human and Ecological Risk Assessment* in 2007 examined the safety of wood pressure treated with alkaline copper quaternary compounds (ACQ). They concluded that the exposure to copper from contact with this pressure treated wood is not expected to have adverse effects on the health of adults or children. They used the scientifically well recognized exposure assessment methods of the US Consumer Product Safety Commission in the study.

All chemicals in all consumer products have a toxicity and most are very low so they are not a problem, especially those regulated by the federal government. That is the case with the currently registered wood preservatives that contain copper. In fact small amounts of copper are necessary for human and plant life and termed “an essential trace element”.

*Note:* Bulletins, information sheets and online postings in North America dated 2003 or earlier refer to chromated copper arsenate (CCA) treated wood, which is no longer sold for exterior residential construction in Canada or the United States (excluding roofing and Permanent Wood Foundations).

### Author

John R. Harrison is President of JRH Toxicology, a consulting firm specializing in providing scientific advice to industry and government since 2001. Previously John spent thirty years with Health Canada serving in a series of technical and management positions. As an environmental and occupational toxicologist, he was involved in regulatory and research areas including the Canadian Environmental Protection Act, environmental contaminants, indoor environment quality, pesticide regulation, pressure treated wood and heavy metal toxicology as well as natural health products. He lectured in toxicology at the Emergency Response Seminar, Department of Transport. He has been a long-standing member of the Society of Toxicology of Canada, the American College of Toxicology and the Society of Toxicology of the USA.

<sup>1</sup> David H. Trinklein (2014). Raised-Bed Gardening. G6985, pps. 1-4. University of Missouri Extension.

<sup>2</sup> B. Rose Lerner (2009). Purdue University. Consumer Horticulture. Container and Raised Bed Gardening. HO-200-W. [www.hort.purdue.edu/ext].

<sup>3</sup> C.S. Love, B. Gardner and J.J. Morrell (2014). Metal Accumulation in the root crops grown in planters constructed from copper azole treated lumber. *Eur. J. Wood Prod.* 72: 411-412.

<sup>4</sup> C.A. Cushing, R. Golden, Y.W. Lowney and S.E. Holm (2007). Human Health Risk Evaluation of ACQ-Treated Wood. *Human and Ecological Risk Assessment: An International Journal*. Vol. 13, Issue 5, pps. 1014-1041.