

## Don't plant under black walnut trees with any other plants but these:



**Mature Black Walnut (*Juglans nigra*) in an old field.**

When I was living in Springfield, Missouri, there were two types of trees that dominated the city, Osage orange and Black Walnuts. There are many beautiful open grown trees which line city streets, producing a bountiful crop of heavy fruit in the fall; making jogging through the city parks somewhat of an obstacle course.

Black walnuts (*Juglans nigra*) are one of the most valuable trees native to Missouri, it is found in almost every County.<sup>1</sup> Having taken wood working classes in my youth, I learned to appreciate the beautiful deep heartwood of the tree, which is perfect for tuning on a lathe or making fine furniture. Besides having valuable wood, the “walnuts” are used in cooking. But when it comes to gardening, particularly vegetable gardening, black walnut trees can cause some gardening headaches.

### **“Allelopathy”**

Black walnuts trees are allelopathic, that is they contain a toxic substance called juglone; inhibiting the growth of plants beneath its canopy or near its roots. In plant science, plants which are allopathic are helpful in limiting weed populations in fields, particularly when used as a cover crop. Allopathic plants typically produce toxic substances in their roots which inhibits the growth of nearby plants, limiting weed competition. For the black walnut though, all parts of the plant contain the toxin, and it is very important not to use black walnut wood mulch, leaves, or hulls, in your garden. Black walnut

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<sup>1</sup> Steyermark, Julian A. “Flora of Missouri.” 1975. P. 510-511.

trees are particularly toxic to broadleaf plants,<sup>2</sup> which includes many common vegetables such as one of the most planted vegetable in the Ozarks, the tomato.

Since the alleopathic effects of juglone can be present up to 80 feet away from the base of the tree, when starting a vegetable garden, it is very important to plot out the garden at least 50 feet away from the drip line of a mature black walnut tree.<sup>3</sup> Vegetable plants which are susceptible to the effects of juglone, include tomatoes, peppers, potatoes, eggplant, and cabbage. Most of these particularly sensitive vegetable plants come from the night shade family. Some other common flower garden plants that are sensitive to juglones are Asiatic lilies, columbine, lilacs, and Rhododendrons. Typical symptoms of walnut toxicity include chlorosis or yellowing of leaves and deformed or stunting of plant growth. Even after a walnut tree is removed from a site, the juglone toxin can remain viable in the soil for years, causing wilting and yellowing of a garden planted on the site; its symptoms resembling environmental stress, nutritional deficiencies, and herbicide damage. Many plants such as tomatoes will succumb to the effects of the toxin and will eventually die.

But don't despair, if you are blest with a beautiful stand of mature black walnut trees, there are many common garden plants which are resistant to the effects of juglones. Surprisingly, many huechera, astilbe and hosta varieties can all be planted under black walnuts. In Springfield, the Hosta Society has a beautiful hosta garden underneath a thick stand of walnuts. Many native plants including mayapples, Jacobs ladder, and wild bergamot are also resistant. From personal experience, the native understory shrub spice bush, does very well under black walnut trees.

If you do not have space to grow tomatoes and other *Solanaceae* crops away from black walnuts, try container gardening or construct line raised beds filled with soil from another location, which will remove the chance of walnut toxicity of these crops.

Although black walnuts do not make the best shade trees for home gardens due to its allopathic affects and its tendency to drop its leaves early in the season along with a bountiful crop of heavy walnuts, it is not impossible to have a beautiful garden underneath these trees. For more information concerning plants tolerant of black walnut trees, the Ohio State University Extension has a great fact sheet available online at: <http://ohioline.osu.edu/hyg-fact/1000/1148.html> .<sup>456</sup>

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<sup>2</sup> Ross, Merrill A. and Carole Lembi, "Applied Weed Science." 3<sup>rd</sup> Ed. 2009. P. 18-19.

<sup>3</sup> <http://ohioline.osu.edu/hyg-fact/1000/1148.html>

<sup>4</sup> <http://csip.cornell.edu/Projects/CEIRP/AR/Allelopathy.htm>

<sup>5</sup> <http://www.mortonarb.org/tree-plant-advice/article/887/plants-tolerant-of-black-walnut-toxicity.html>

<sup>6</sup> <http://pubs.cas.psu.edu/FreePubs/pdfs/xj0039.pdf>