



BLACK WALNUT TOXICITY

Background

Walnut trees are all part of the genus *Juglans*. There are some 15 species of deciduous walnut trees, sometimes shrubs, found in S.E. Europe, Asia, North and South America. Some of these species include *J. californica* (Californian walnut), *J. cinerea* (Butternut), *J. regia* (English or Persian walnut), *J. nigra* (Black walnut), and *J. sieboldiana* (Japanese walnut). Walnuts are grown for their fruit (what is ordinarily called a nut). In addition, some species are grown for the dark wood used to construct furniture.

J. nigra (Black walnut) is a long-lived, vigorous spreading tree with pinnate, aromatic leaves up to 24-inches long, each with 11 to 23 oblong, glossy, dark green leaflets. This tree can grow to over 100-feet tall, attaining a spread of up to 70 feet.

Problem

The Black walnut (*J. nigra*) produces a chemical called juglone that is toxic to many plant species. Highest concentrations of this chemical are found in buds, leaves, nut husks and roots. The chemical is not very soluble, but it accumulates under the tree's drip zone. (The drip zone is the area on the ground measured from the trunk of a tree or shrub to the outer edge of its branch reach.) Typically, the chemical is released by decaying leaves and roots. Death or poor growth of other plants may occur under the spread of Black Walnut trees due to this chemical. Other species of the *Juglans* produce smaller amounts of juglone.

Plants sensitive to juglone include alder, alfalfa, apple, birch, blackberry, blueberry, cabbage, eggplant, mountain laurel (*Kalmia*), lilac, magnolia, peony, pepper, potato, pine, privet, rhododendron, some rose varieties, silver maple, strawberries, tomato and turf grass.

Resistant plants to juglone include beans, beets, cedar, cherry, corn, daffodil, elm, ferns, forsythia, hawthorn, hemlock, iris, locust, most maples, oaks, onions, orchard grass, pachysandra, sycamore, viburnums, and wheat (PNW Disease Management Handbook, 2016).

Susceptible plants grow poorly or decline and die adjacent to Black Walnut trees. If Black walnut leaves are used for mulch, the stems of these plants may show blisters or spots.

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Control

1. Consider neighboring plants, soil pH, moisture, drainage, and exposure to sun and wind when selecting a Black walnut for your property.
2. Locate sensitive plants well away from all walnut trees.
3. Avoid accumulation of leaves and nut hulls under and around the trees. Raked debris should be stored and composted separately.
4. Do not use walnut leaves or hulls as mulch around susceptible plants.

Composting

1. Although Black walnut leaves do contain small amounts of the toxic plant chemical juglone, juglone can cause the wilt and death of sensitive plants that encounter a low concentration of juglone. However, Black walnut leaves can degrade in two to four weeks and the juglone degrades when exposed to air, water and bacteria. It does break down completely within two months in a compost pile.
2. If there are volumes of Black walnut leaves, the leaves can be composted separately. If in doubt, test for juglone toxicity by planting tomato seedlings in the compost. Tomatoes are very sensitive to juglone and will wilt and die if there are toxic levels of juglone in the pile.
3. As a precaution, sawdust and chips from the Black walnut should not be used around plants that are sensitive to juglone.

References

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