

Walnut Trees "Zap" Others

Black walnut trees can stress, or kill, other plants growing near them. Symptoms are wilting and yellowing of the leaves, death of plant parts, and death of the entire plant. But some plants grow well near walnut trees.

The difference between plants that can grow near walnut and those that cannot depends upon their tolerance to the chemical "juglone" (5 hydroxy-1, 4-naphthoquinone). Juglone is produced in walnut leaves during the growing season, then moves into the roots. Juglone is a strong respiration toxin which may prevent plants from fully utilizing energy the leaves have captured. High concentrations of juglone in some plants cause so much energy to be wasted that the plant cannot meet the minimum energy levels required for life.

Juglone is released from walnut trees in several ways: leaves falling and decaying, nut husks, root leakage and decay, and rain-drip from the crown. Juglone is poorly soluble in water and cannot move far in the soil. But only minute amounts are required to poison some plants. Plant roots can encounter juglone when they grow within 1/2 to 1/4 inch from walnut roots. Most walnut roots can be found at a distance of one to two times the crown radius from the trunk, but some may extend out as far as three or four times the crown radius.

Plant roots will also encounter juglone when growing under the drip line or crown-edge of walnut. The juglone in this areas comes from erosion of the surfaces of leaves, twigs, and buds by rain, and from decay of leaves, twigs, and nut husks. Many plants that can survive near a walnut, cannot survive under the crown-edge of the tree because of the larger amount of juglone present.

Plants to keep away from walnuts are: pines, birch, hackberry, apples, basswood, blackberry, domestic grape, tomatoes, potatoes, and alfalfa.

Plants that can grow well with walnuts are: red cedar, hickory, elm, sycamore, crab-apple, hawthorn, cherry, locust, maple, black raspberry, wild grape, Kentucky blue grass, and clover.

Gardens should be kept away from walnut trees. Leaves, bark, or wood chips of walnuts should not be used to mulch plants. In agricultural fields, no juglone damage should exist if constant tillage keeps cutting back the walnut roots from the field. With minimum-tillage becoming more wide-spread, fields with walnut trees on their edge may have small pockets of dwarfing due to juglone.

Other trees also produce juglone. For example, butternut, English walnut, pecan, shagbark hickory, and bitternut hickory produce juglone that can affect other plants. But these species only produce a relatively small amount compared to black walnut.

Credit: The American Tree Farmer

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