

Problem: Walnut Wilt



Plants Susceptible: Tomato, potato, blackberry, apple, lilac, asparagus, chrysanthemum, and peony.

Plants Resistant:

Red cedar, redbud, quince, black raspberry, Kentucky bluegrass, corn, bean, carrot, dandelion, zinnia, and practically all native hardwoods.

Description:

Tomato, potato, alfalfa, and other herbaceous and woody plants can be afflicted with a disorder known as walnut wilt. This malady is associated with root uptake of a chemical called juglone which is produced by several species of trees in the walnut family, including black walnut, Persian walnut, butternut, and pecan. Juglone is formed in the leaves, fruit hulls, inner bark, and roots of the walnut and is leached or released into the soil. This chemical has fungicidal and insecticidal properties. It also is quite toxic to many plant species and induces wilting and stunting. The ability of plants to produce and release chemicals which are toxic to other plants is called allelopathy. The severity of the juglone toxicity partly depends on the proximity of the plants to a walnut tree. Generally, those tomatoes growing next to a walnut tree abruptly wilt and die in early to mid-summer. Those plants growing a short distance away may not be killed but become flaccid and stunted. The woody stem tissue of affected plants turns brown. The symptoms of walnut wilt closely resemble those of *Fusarium* and *Verticillium* wilt; however, the disorder may be distinguished from the other wilts by the constant association of walnut trees with the wilting symptoms.

Incitant: Toxin (juglone) produced by members of the walnut family. Juglone may be leached from leaves and nuts into the soil during rain or released from roots. The chemical is highly reactive and is quickly inactivated in the soil. The major uptake of the toxin occurs when the tomato roots make contact with the roots of the walnut.

Recommendations:

Tomatoes or other susceptible plants should not be grown near black walnut or other trees which produce juglone. The removal of walnut trees may not have an immediate effect since the toxin can persist in the inner bark of roots for several years. Do not plant tomatoes for at least two years after the removal of walnuts.

References:

1. [Wilt, Nematode, and Virus Diseases of Tomato](#). K-State Research and Extension, Publication L-723.
2. Walnut Wilt, 67th Annual Report of the Northern Nut Growers, Pg 114 - 121

Last Update: 3/31/2009

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

“Knowledge for Life”

Kansas State University Agricultural Experiment Station and Cooperative Extension Service