

Verticillium Wilt

Vascular wilt of hardwoods

Pathogen—Verticillium wilt is caused by two closely related species of fungi, *Verticillium albo-atrum* and *V. dahliae*.

Hosts—Verticillium wilt is a vascular wilt of hardwoods. Over 300 plant species are affected by Verticillium wilt. The disease is particularly destructive to trees in landscape plantings. Ash, catalpa, elm, sumac, and maple are the most common hosts in the Rocky Mountain Region.

Signs and Symptoms—Typical symptoms include chlorosis, wilting, marginal and interveinal necrosis of the foliage, branch dieback, and mortality (fig. 1). Symptoms vary among hosts and are not always completely diagnostic. Symptomatic wilting is most obvious on warm, sunny days. The disease often progresses from the lower crown upward, but it is not unusual for only a branch or portion of the tree to be impacted.

The sapwood may exhibit dark streaks or bands along the grain (fig. 2). The color of the streaking depends on the host and may be shades of green, red, brown, or black.

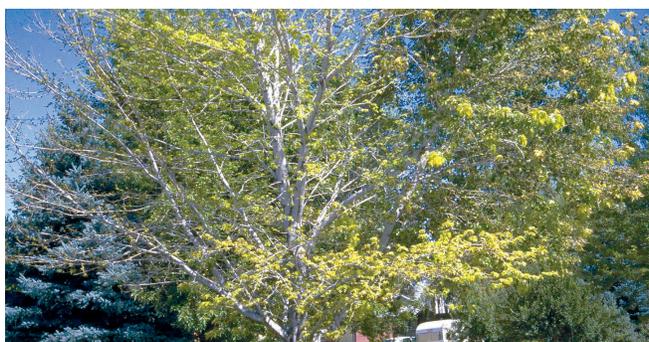


Figure 1. Verticillium wilt on silver maple. Photo: William Jacobi, Colorado State University, Bugwood.org.



Figure 2. Discolored streaks in the wood of a cherry branch infected by Verticillium wilt. Photo: William Jacobi, Colorado State University, Bugwood.org.

Disease Cycle—The fungi that cause Verticillium wilt are soil-borne and gain entry through roots or wounds near the ground. Once inside the host, they invade the xylem, which disrupts water transport and physiological function. Spread can occur throughout the plant by spores transported in the sap stream or by vegetative growth of mycelium. Plant-to-plant spread occurs by means of asexual spores (conidia) and by resting spore structures (microsclerotia) that allow the fungi to persist for long periods of time in the soil independent of any host material. Long-distance dispersal is a serious problem because microsclerotia can be carried in soil, bare roots, root balls, or equipment within nurseries to planting sites.

Impact—Small trees are very susceptible and may be killed rapidly by Verticillium wilt. Older trees generally deteriorate over time and can survive for several or many years with the disease. Damage is greatest in nurseries and landscape plantings. Stressed trees are more susceptible to Verticillium wilt and sustain more damage.

Management—The following control strategies can be used to reduce impacts of Verticillium wilt:

- Do not plant susceptible hosts in areas where the disease is present.
- Maintain tree vigor by fertilizing with “balanced” fertilizers (10-10-10 [N-P-K]) and watering. High-nitrogen fertilizers may increase damage.

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- Prune back branches beyond any streaking in the wood. Destroy infected branches and sterilize pruning tools.
- Avoid damage to the roots and base of trees.
- Plant resistant or tolerant species.

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1. Riffle, J.W.; Peterson, G.W., tech. coords. 1986. Diseases of trees in the Great Plains. Gen. Tech. Rep. RM-129. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 149 p.
 2. Sinclair, W.A.; Lyon, H.H. 2005. Diseases of trees and shrubs. 2nd ed. Ithaca, NY: Cornell University Press. 659 p.

