RESEARCH LABORATORY TECHNICAL REPORT

BARTLETT TREE EXPERTS
SCIENTIFIC TREE CARE SINCE 1907

Verticillium Wilt

By The Bartlett Lab Staff
Directed by Kelby Fite, PhD

Verticillium wilt is a vascular disease that affects many woody trees and shrubs, herbaceous ornamentals, weeds, vegetables, and agronomic crops. Among shade trees, maples are particularly susceptible and hence the name "Maple Wilt" often has been applied to this disease by arborists.

Symptoms

Initial symptoms appear as sudden wilting, browning, and shedding of leaves on one branch or one area of the crown (Figures 1 and 2). These symptoms may spread gradually throughout the crown. Severely affected trees may eventually succumb to the disease. Delayed budbreak, sparseness of the crown, reduced twig growth and early fall coloration frequently are associated with chronic forms of the disease. Affected trees or areas of the crown may fail to leaf out in the spring. Internally, the sapwood in symptomatic branches and in the roots and lower bole usually exhibits a distinct discoloration. The discoloration is typically not contiguous around the entire ring of sapwood, but occurs as streaks varying from green to brown to nearly black (Figure 3).

Figure 1: Dieback of Japanese maple due to verticillium wilt disease

Causal Agents

Verticillium wilt of woody ornamentals is caused by two species of fungi: *Verticillium albo-atrum* and a related species, *Verticillium dahliae*. The fungi are soil inhabitants that are capable of surviving long periods

Figure 2: Verticillium wilt disease of sugar maple

in the soil. The fungi can also survive in roots of both susceptible and non-susceptible plants. Infection occurs primarily through wounds in roots or branches, or possibly by direct penetration of healthy roots. Following infection, the fungi colonize the vascular system, which interrupts translocation of water and nutrients resulting in wilt symptoms. Resting structures of *Verticillium* spp. are disseminated by flowing water such as irrigation water, infested soil, and also may be windblown for considerable distances. Contaminated pruning tools may be responsible for new infections.

Figure 3: Vascular streaking of sugar maple caused by *Verticillium* sp.

Control

Verticillium wilt on woody ornamentals in the landscape can be minimized by maintaining plant vigor through periodic and appropriate fertilization, pruning, and irrigation during dry periods. Avoid planting susceptible ornamentals adjacent to vegetable gardens and agricultural fields or in areas where these crops were once grown. Do not replant a susceptible species where a previous planting has succumbed to the disease. Branches that have died from Verticillium wilt should be removed. When feasible, prune back affected limbs and branches beyond the last observable evidence of sapwood staining. Disinfect tools with a dilute liquid bleach or alcohol solution before pruning healthy trees. Plants seriously declining from Verticillium wilt usually do not respond to therapeutic treatment and removal may be necessary.

Founded in 1926, The Bartlett Tree Research Laboratories is the research wing of Bartlett Tree Experts. Scientists here develop guidelines for all of the Company's services. The Lab also houses a state-of-the-art plant diagnostic clinic and provides vital technical support to Bartlett arborists and field staff for the benefit of our clients.