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BACTERIAL LEAF SCORCH OF SHADE TREES

Bacterial leaf scorch (BLS) is a vascular disease of shade trees caused by the bacterium, *Xylella fastidiosa*. It can infect a wide range of host plants including oak, maple, horsechestnut, ash, elm, dogwood, sweetgum, mulberry, sycamore, and cherry. Trees in nurseries, landscapes as well as those in woodland areas are susceptible. The disease is spread by sap-feeding insects and introduced to new areas by movement of infected plant material. BLS has been detected in the eastern United States, as far west as Texas and as far north as parts of New York and Wisconsin. At the time of this publication, BLS has been detected in Fairfield County, Connecticut.



Figure 1. Marginal necrosis on leaves of a swamp white oak. Image: T. DeSimone

SYMPTOMS AND DIAGNOSTICS

BLS clogs the xylem of infected trees, disrupting the flow of water and nutrients to the leaves. Symptoms first appear as marginal necrosis. Borders of the diseased tissue may have a water-soaked appearance and sometimes a distinct yellow band (Figure 1). Symptoms progress from leaf margins to the midribs and petioles. Infected trees may also exhibit leaf curling, delayed budbreak, or a decrease in fruit or nut production. Symptomatic branches may appear in isolation or throughout the canopy.

BLS symptoms appear similar to those caused by other water stress issues. Samples must be sent to a laboratory where an enzyme-linked immunosorbent assay (ELISA) or molecular techniques can be used for diagnostic confirmation. The best time to submit samples in Connecticut is during September and October, when bacterial titers are highest.

DISEASE DEVELOPMENT

X. fastidiosa is typically vectored by xylem-feeding insects such as leafhoppers or sharpshooters. In certain host plants, *X. fastidiosa* may also be passed between plants through grafts.

Once bacterial cells are introduced to the xylem of the host, they proliferate and clog the vasculature, resulting in leaf scorch symptoms. These symptoms typically appear from mid-summer until autumn. Over several seasons, the infection may spread

systemically from the first infected branches throughout the tree causing canopy dieback, decline and eventually tree mortality (Figure 2). Drought conditions and other stressors enhance the development of BLS.

On oak, BLS symptoms may be mistaken for oak wilt. However, there are key differences. While both diseases produce symptoms of scorch on leaf margins, oak wilt appears earlier in the season, generally late spring to early summer, and leads to early defoliation. Tree mortality from oak wilt is often more rapid. Trees in the red oak group may die the same year the infection took place.



Figure 2. Dieback in the canopy of an infected young swamp white oak. *Image: T. DeSimone*

In addition to BLS, *X. fastidiosa* is responsible for several important diseases of crop plants including Pierce's disease of grapes, citrus variegated chlorosis, and olive quick decline syndrome. Over 100 host plants are thought to serve as reservoirs of the

bacterium without exhibiting visible symptoms.

MANAGEMENT

There are no known cures for trees infected with BLS. Management strategies focus on promoting tree vigor and reducing stress. While several species of shade trees are known to be particularly susceptible to BLS, the species listed in this factsheet do not constitute an exhaustive host list, and new host species continue to be identified.

Cultural practice: Maintain vigor by mulching trees, watering during drought, and reducing compaction near the root zone. Prune infected branches to slow disease progression, to prevent secondary invaders and to remove potentially hazardous limbs.

Chemical application: Specimen or high value trees may be candidates for treatment during early stages of infection. Injections of the antibiotic oxytetracycline may be applied to reduce the severity of the disease, but it will not act as a cure. As the potential insect vectors are numerous and diverse depending on the host plant, attempts to target those insects in the landscape are generally not recommended or economical. Always read and follow the label instructions before applying any chemical treatment.