



Bacterial Leaf Scorch

Bacterial leaf scorch is a disease, which causes premature defoliation, dieback and eventual death of trees. It is caused by a fastidious xylem-limited bacterium (FXLB) *Xylella fastidiosa*. Fastidious refers to the bacterium's specific nutritional requirements in laboratory cultures. In diseased plants, the bacterium grows only in the xylem or wood. Since its discovery in 1973, *X. fastidiosa* has been isolated from more than 28 families of plants including grasses, herbs, shrubs and trees. Trees known to be infected by *X. fastidiosa* include **ash, oak (especially the red oak group), mulberry, elm, maple, sycamore, London Plane and sweetgum.**

X. fastidiosa is spread from diseased to healthy trees by leafhoppers and possibly the oak treehopper, *Platycotis vittata*. Once introduced into the plant, the bacterium grows within the xylem of the leaves, branches and roots. Leaf scorch results from moisture stress due to plugging of vascular tissues in leaves, twigs and branches.

Bacterial leaf scorch has been identified principally in the warmer areas of the United States including California, and the Southeastern United States. In the Eastern United States, leaf scorch has been identified as far North as New York and Pennsylvania.

SYMPTOMS

Bacterial leaf scorch is first evident as a browning of the leaf margins. A distinct yellow band (halo) often occurs between the brown and green portion of the leaf. Scorch symptoms usually begin to appear in late July or early August. By September, defoliation of affected leaves usually occurs.

Symptoms usually first appear on one branch and progressively spread throughout the crown in subsequent years. On large shade trees, it may take five to ten years for the disease to progress through the entire crown.

Infested branches generally releaf for several years following the onset of scorch symptoms. Growth is significantly reduced. Following several consecutive years of premature defoliation and moisture stress induced by the disease, branch dieback occurs. In many instances, secondary canker causing fungi and insect borers infest the stressed trees, which accelerates decline. Large shade trees may live for ten years or more with leaf scorch while young transplants may die within three to four years.

Confirmation of this disease is usually performed by a serological test known as ELISA (Enzyme Linked Immuno Sorbent Assay). Samples for diagnosis of bacterial leaf scorch should be collected from the scorched area of the crown. Collect at least 5 live twigs with leaves attached. Twigs

should be at least 12 inches long. Place twigs in plastic bags and express mail to a plant diagnostic lab equipped to analyze bacterial leaf scorch.

DISEASE MANAGEMENT

There is no effective preventative treatment for bacterial leaf scorch. Leafhoppers, which spread the disease, are active for most of the growing season, which makes disease prevention by controlling the vector with insecticide treatments impractical.

For treatment of diseased trees, trunk injections of an antibiotic have been shown to suppress leaf scorch symptoms in experimental treatments. However, treatment must be made annually. If treatment is stopped, scorch symptoms return to the same extent as prior to treatment. Late May or early June is an effective time for treatment.

Radical pruning of diseased branches is another possible treatment that may be effective if the disease is detected early. Branches should be removed well below any scorch symptoms because branches can be infested with *X. fastidiosa* before showing symptoms.

Finally, mulching diseased trees and irrigating heavily during periods of low rainfall will reduce moisture stress and possibly delay scorch development. The effect of fertilization on disease development and severity is unknown. Therefore, fertilization of diseased trees should be undertaken only if soil or foliar analysis indicates a nutrient deficiency.