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SP661 Bacterial Leaf Scorch in Landscape Trees

The University of Tennessee Agricultural Extension Service

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SP661

Bacterial Leaf Scorch in Landscape Trees

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Bacterial leaf scorch is a chronic disease caused by a bacterium, *Xylella fastidiosa*, that grows in the xylem of the tree and physically clogs these water-conducting vessels. As the bacterium multiplies, water transport becomes more limited. The tree suffers water stress, especially in mid to late summer, resulting in leaf scorch; a browning or discoloration of the margins of the leaves with interior portions of the leaves near the veins remaining green. The bacterium is spread by leafhoppers, spittlebugs and other xylem-feeding insects.

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Bacterial leaf scorch on northern red oak.

Hosts and Symptoms

Bacterial leaf scorch has a wide host range including many herbaceous and woody species (goldenrod, alfalfa, clover, blackberries). Tree species most affected are elm, sweetgum, sycamore, dogwood, mulberry, red maple, sugar maple and particularly, many species in the red oak family – pin, northern red and scarlet oaks. Symptoms usually appear on one branch and progressively spread throughout the crown in subsequent years. On large trees, it may take five to 10 years for the disease to progress through the entire crown. Infested branches generally releaf for several years following the onset of scorch disease symptoms. Leaves will appear normal in the spring, but later show scorch symptoms. Growth is reduced and tree crowns become progressively sparse as the tree declines. Eventually, infected trees will succumb from the disease.

Diagnosis

Symptoms of bacterial leaf scorch are often mistaken for those produced by vascular wilt diseases such as oak wilt and Dutch elm disease. The difference is that the scorch and decline occurs progressively over several years rather than occurring over a period of two or three months with the wilt diseases. Sometimes bacterial leaf scorch is difficult to diagnose on symptoms alone, since the symptoms are similar to other related tree responses to drought, salt damage or root injury. Early fall coloration of leaves often coincides with leaf scorch. Therefore, a plant tissue analysis lab must perform a positive diagnosis to determine if the bacterium is present.

Integrated Management

Unfortunately, no cure or treatment for infected trees or a strategy for preventing infection is presently available. Leafhoppers and other insects that spread the disease are active for most of the growing season. This makes disease prevention by controlling the insect vector with insecticide treatments impractical.

The life of infected trees can be prolonged with judicious management. Trunk injections with antibiotics

U.S. National Arboretum

Leafhoppers are vectors of bacterial leaf scorch.

have been shown to suppress the symptoms. Treatments must be made annually in late May or early June. Antibiotics only cause a remission of the symptoms, not a cure. Injections must be applied each year. The continual wounding made by these injections raises concerns whether the wounds provide an entrance to secondary disease organisms.

Pruning is another possible treatment if the disease is detected early. Pruning of infected branches can delay the spread of the disease within the crown. Mulching and watering during drought periods may reduce moisture stress and possibly delay scorch development. The effects of fertilization are unclear with this disease. Fertilization treatments are recommended when a soil or leaf analysis shows a nutrient deficiency.

Summary

Since there is no effective treatment or cure for bacterial leaf scorch, one should expect diseased trees to be gradually lost over the years. The eventual best remedy for bacterial leaf scorch is tree replacement once the tree no longer adds to the landscape. However, the life of the tree can be prolonged somewhat with judicious management since tree death is not immediate. Thus, tree replacement can be done before the infected tree dies, allowing tree establishment before infected trees are removed.

Sources

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Theodor Leininger, USDA Forest Service

Bacterial leaf scorch on a sycamore leaf. Note the live tissue near the veins of the leaf and the dead tissue at the leaf margins.

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