What is Bacterial Leaf Scorch?

Bacterial Leaf Scorch (BLS) is a devastating disease of shade trees that is caused by the xylem-inhabiting bacteria *Xylella fastidiosa*. Leaf desiccation is the most prominent visible symptom, although infected trees may eventually display dieback, branch death, and prematurely die. Commonly infected trees include oaks, elms, sycamores, and sweet gum, as well as other varieties.

Symptoms of Bacterial Leaf Scorch?

When bacteria colonize the xylem vessels, the availability of water to the leaves is restricted and scorch develops. Symptom severity tends to increase when drought stress is also present.

- Leaves develop normally early in the season and symptom expression begins in June and July.
- Necrosis begins along the leaf margin and spreads toward the veins and petiole in an irregular pattern.
- Green tissue is separated from reddish brown necrotic tissue by a band or halo that is yellow in color.
- Scorch symptoms will reappear in the same limbs from one year to another and eventually spread to other limbs.
- Infected trees display an overall decline in vigor, branch dieback, and premature death.

Transmission of Bacterial Leaf Scorch

Bacterial leaf scorch is spread via xylem feeding insect vectors including sharpshooters, treehoppers, leafhoppers, and spittlebugs. It may also spread from one tree to another by root grafts.

Susceptible Trees

Oaks: red oak, pin oak, bur oak, white oak, willow oak, (approximately 12 other species of oak), sycamore, American elm, maples: red maple, sugar maple, mulberry, sweet gum, and almond.
Bacterial Leaf Scorch Treatment Strategies

Managing Bacterial Leaf Scorch

Bacterial leaf scorch has no known cure. A variety of management practices can successfully extend the longevity of infected trees. These include treatment with antibiotics and water stress reduction through mulching, irrigation, and growth regulation. These management practices are very successful; however, annual treatments with antibiotics are needed to keep this disease suppressed and the tree alive.

Treatment Strategies

Research by Kostka, Tattar, and Sherald has shown that bacterial leaf scorch can be successfully managed with an annual application of an oxytetracycline antibiotic called Bacastat™. This treatment is effective at suppressing bacterial growth in the water conducting vessels where most of the injury occurs. Other practices that help the tree include: watering during droughty periods, mulching the root zone, and the application of a growth regulator such as Cambistat®, which can increase the drought tolerance and reduce water loss. Cambistat® increases root growth, defense chemicals, and chlorophyll in the leaves by about 35%.

Treating With Bacastat™

Bacastat™ application requires the use of a micro-infuser system such as the M3 Micro Infusion System. The best time to treat a tree is in the spring of the year, before July 1st. Treating after this time will suppress the bacteria, but symptoms may not be affected. Treatment is required annually. Bacastat™ is a water based product that comes unmixed. Using only water as a carrier causes little injury at the injection site (as compared to alcohol based). Premixed oxytetracycline will lose its potency and thus effectiveness over time.

Mulching the Tree (Optional)

Applying a 3 inch deep ring of mulch at the base of the tree will reduce grass competition, increase moisture retention, and increase the fibrous root system of the tree. The larger the area the better; however, even a ring that extends 5 feet from the trunk can have tremendous benefit.

Treating With Cambistat® (Optional)

Cambistat® must be carefully applied in EXACTLY the right amounts as shown in the application guide. Dosing is determined by tree species as well tree size. Cambistat® is applied to the soil in a small trench at the base of the tree, and can be applied at any time. Typically, it takes at least one year for darker, greener leaves and reduced growth to become apparent, but these benefits last for three years.

DIY Shopping List

Option 1:

Application Type – Micro Infusion

DIY Product/Equipment Needed

- M3 Micro Infusion System
- Bacastat™
- Drill bits (included with the system)
- Stiff bristled hand brush
- Shovel

Option 2:

Application Type – Soil drench

DIY Product/Equipment Needed

- Cambistat®
- Graduated cylinder measuring in mL
- Bucket or watering can
- Shovel

Photo, above: Cambistat® application to the base of the tree. Below: Before treatment and one year after treatment with Cambistat®. Courtesy of Bartlett Tree Experts.