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Test Now for Bacterial Leaf Scorch

I'm beginning to see symptoms of bacterial leaf scorch develop in central Illinois, and a number of samples have been submitted that appear to be infected in the last few weeks.

Bacterial Leaf Scorch (BLS) is a serious infectious disease with a wide host range of trees and shrubs. The disease causes the slow decline of the host, resulting in host death. It is caused by the bacterium *Xylella fastidiosa* which is also responsible for Pierce's Disease in grapes and is currently causing widespread damage to the Italian olive industry.

In Illinois, it affects a wide number of trees. The most common hosts in our state are oak (red oak group), elm, sycamore, London plane, sweet gum, hackberry, ginkgo, and maple (sugar and red). Many other woody and herbaceous plants can be susceptible to the pathogen. The bacteria is found only in the xylem (water-conducting) tissue of the plants, and is spread from host to host by root grafts. Xylem-feeding leafhoppers, treehoppers, and spittlebugs are also thought to act as vectors for the pathogen. The disease does not spread quickly between hosts.

Scorch symptoms appear on leaves in early to midsummer, and gradually intensify as the season progresses. Affected leaves may turn a yellow/green color and then turn brown, usually from the margin of the leaf inwards (see picture). Older leaves are often affected first, and an individual branch or section of branches usually become discolored at the same time. Symptoms are generally not scattered throughout the crown. Branches will leaf out the following spring, but symptoms will re-appear and slowly spread through the crown of the tree over the course of subsequent seasons. Except in oaks, leaves generally do not drop until autumn.

The symptoms are easily confused with drought stress, cultural problems, cankers, and, in oak trees, oak wilt. It can also be confused with Verticillium wilt in some trees. Submitting a sample to a plant diagnostic laboratory is the only way to definitively diagnose the disease. At the University of Illinois Plant Clinic, we use an antibody test to determine the presence or absence of the pathogen in symptomatic tissue. Testing is performed once a year, in late August or early September. This is because the population of bacteria within the affected tissue increases as the season progresses, so testing in late summer is most accurate due to the increased pathogen numbers. A test conducted in spring or early summer may result in a false negative due to the population of bacteria being too low.

If you suspect that a tree or shrub is affected by BLS, you may submit a sample

to the University of Illinois Plant Clinic starting in August. We will store the samples until we perform the test. **Samples should consist of symptomatic leaves complete with petiole** (the structure that attaches the leaf to the branch). Ideally, at least a few of the leaves would be transitioning from green to brown. There is a $25 fee for this test. To download a sample submission form, please visit the Plant Clinic's website at www.web.extension.illinois.edu/plantclinic and click on the "Sample Forms" tab. Please indicate that you wish the sample to be tested for BLS.

Management for trees affected with BLS consists of increasing tree vitality by mulching the base of the tree to retain moisture, watering during periods of dryness lasting more than 2 weeks, pruning out dead branches, and fertilizing when appropriate. While trunk injections with antibiotics have been shown to be effective at delaying symptom development, they do not cure the tree and the injection sites open new paths of entry for organisms that decay wood. Over time, repeated treatments can severely weaken the tree. Choosing non-susceptible hosts to plant near affected trees is also recommended to prevent the spread of disease. (*Diane Plewa and Travis Cleveland*)

White Grubs

Japanese beetles and masked chafer adults are attracted to moist soils and, apparently, to green grass to lay their eggs. In years when rainfall is abundant, nonirrigated (as well as irrigated) turf stays green and attractive to egg-laying female beetles. As a result, eggs are laid over all of these areas, resulting in fewer eggs laid per square foot. The resulting larvae are usually fewer than the 10 to 12 white grubs typically necessary to cause turf injury. In those areas of Illinois with an abundance of rainfall this year, such as in the northwestern part of the state, grub treatment may not be needed.

In dry years, the beetles are strongly attracted to the moist soils and green grass of irrigated turf to lay their eggs, laying relatively few eggs in the dry, brown, unwatered turf areas. This results in high numbers of white grubs in watered turf, which cause damage in the form of wilted, brown turf that is easily pulled back due to the white grubs eating the roots.

In much of Illinois, irregular rains have caused many areas of turf that are not irrigated to green up for a few days and then turn brown for a week or so until the next rain. These rains do not appear to be wetting the soil very deeply. As a result, the Japanese beetle and masked chafer adult beetles have likely laid considerably more eggs in irrigated turf. This sets up a situation in which damage is likely to become apparent in the second half of August and later, when the resulting white grubs grow large enough to cause serious turf damage.

After the first week of August, most of the white grubs should have hatched, allowing scouting to determine for certain whether treatment is necessary. Scout for white grubs by cutting through the turf with a heavy knife. Pull the sod back to reveal the white grubs in the root zone. Check the soil hanging to the turf roots for white grubs, as well as the soil below the roots. Till the upper 2 to 3 inches of soil with your knife to check for white grubs in that region as well. If

the soil is dry, till a couple of inches deeper to check for grubs that may have migrated down to moister soil.

If at least 10 to 12 grubs per foot square are present, turf damage will be likely to occur without treatment. Apply an insecticide such as chlorantroniliprole (Acelepryn), cyantraniliprole (Ference), trichlorfon (Dylox) or one of the neonicotinoids imidacloprid (Merit), clothianidin (Arena), or thiamethoxam (Meridian). Do not apply Ference or neonicotinoids to turf with blooming weeds or flowers to avoid killing pollinators. (*Phil Nixon*)

Sod Webworm

The hot, dry weather we are experiencing is conducive for sod webworms in non-irrigated turf. High temperatures result in shorter generation times, allowing more generations and higher population numbers. Dry soils reduce the infection rate of naturally-occurring microsporidia that usually help keep larval numbers low. All of this allows more individuals to mature faster resulting in high sod webworm numbers.

Adult sod webworm moths have light tan wings that are held tight against the body, giving the body a tube-like appearance. Their mouthparts have long palps that protrude beyond the front of the head, resulting in they and relatives having the common name, snout moths. The species vary in size from one-half inch to about one inch long, and some species have whitish or brown stripes on their wings. When these moths are disturbed during the day in turf, they fly low to the ground, no higher than your head, in a jerky fashion. They do not fly very far, settling back down onto the turf within about 30 feet of where they were disturbed. The most common species, the larger sod webworm, tends to sit crosswise on the grass blade when at rest. Other species sit lengthwise on the grass blades.

Eggs are dropped into the turf as the adult moths fly across it. The resulting larvae live in a silk-lined tunnel in the thatch during the day, coming out at night to clip off and eat the grass blades. Small balls of green fecal pellets are common around the crowns of infested turf. The larvae are slender with dark brown spots. Their base color may be whitish, gray, tan, or green depending on the species and the larval feeding activity. Fully-grown larvae of the larger sod webworm are about one-inch long. Other species are similar in size or smaller.

Damage first appears as indistinct brown patches of turf. Close examination will reveal that most of the grass blades are missing with the thatch causing the brown appearance. The turf will be firmly rooted. As infestations progress, entire lawns can turn brown.

Sod webworm caterpillars in infested lawns typically attract insect-feeding birds such as starlings, brown-headed cowbirds, red-winged blackbirds, and robins. In the photo, brownish patches caused by sod webworm are present around the feeding brown-headed cowbirds and on the slope behind them. Realize that insectivorous birds also feed on other insects in the turf. Their presence indicates that the turf should be scouted for sod webworms.

Unwatered turf in areas with drought is likely to experience high amounts of sod

webworm larval damage. If unattended, large turf areas are likely to die. If infestations are noticed early and promptly treated, the intact root system will quickly replace the eaten grass blades, resulting in quick recovery of the turf's appearance.

Sod webworms are easily controlled with many insecticides. Effective, labeled products include bifenthrin (Onyx, Talstar), carbaryl (Sevin), chlorantroniliprole (Acelepryn), clothianidin (Arena), deltamethrin (Delta Gard), indoxacarb (Provaunt), lambda-cyhalothrin (Scimitar), trichlorfon (Dylox), spinosad (Conserve), and Steinernema carpocapsae (Biosafe). The last two are considered to be organic. Allow the spray to dry on the grass blades. (*Phil Nixon*)