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Bacterial Leaf Scorch (BLS): What You Need to Know and How to Get It Tested

What is bacterial leaf scorch?

Bacterial leaf scorch (BLS) is an infectious disease caused by bacterium *Xylella fastidiosa* that spreads systemically and causes a slow decline and death of the tree. The disease affects many species of trees and shrubs. The bacterial pathogen is found only in xylem tissue. Xylem-feeding leafhoppers, treehoppers, and spittlebugs are thought to spread the bacterium from tree to tree. The disease can also be transmitted between trees through root grafts. Fortunately, this disease does not rapidly spread. BLS is not new, but is beginning to appear more frequently in the Midwest. Possibly this is a function of more people recognizing the symptoms. It has been noted that drought conditions can cause greater disease severity and may make symptoms more noticeable.

What trees are affected by BLS?

The most frequent hosts of this disease include oak, elm, sycamore, mulberry, sweet gum, London plane, hackberry, ginkgo, sugar maple, and red maple. Be aware, that many other landscape trees can be susceptible to this disease. Most of the samples submitted to the U of I Plant Clinic are oaks. Last year, we tested 23 trees from around the Midwest (not all were from Illinois) and found that 11 were positive for BLS. Thus far, in Illinois, BLS commonly infects pin and red oaks. In 2013, we tested a ginkgo leaf that was

suspected to be positive for BLS; however, the tissue that was tested was old and I would like to confirm results with a resample. Trees are not the only plant hosts that have been found to be infected with *Xylella fastidiosa*. The bacterium has been found to have a wide host range including grasses and broad-leaved plants in some 30 families. It has also been found that some plant hosts may be “asymptomatic” and not exhibit symptoms. Some of the plants that have been found to harbor the bacterial pathogen that causes BLS are listed in <http://extension.psu.edu/pests/plant-diseases/all-fact-sheets/bacterial-leaf-scorch>.

What are the symptoms of BLS?

Look for scorch symptoms that occur in early summer to midsummer and then intensify in late summer. Affected leaf tissues initially have a chlorotic or faded green color that eventually transitions to brown. A yellow or reddish-brown color often separates scorched tissues from healthy green tissues. Symptoms will often show on the oldest leaves first, distinguishing this disease from environmental scorch that first appears on the newest leaves. The symptoms occur first on one branch or section of branches and slowly spread through the crown of the tree from year to year.

What are the symptoms of BLS on oaks?

Most references say that oaks show symptoms on an entire branch at once.

Bacterial scorch often allows infected leaves to remain on the tree until the fall. Oaks are again the exception. They will drop leaves early. If you have seen a slow decline in your oak, leaf scorch symptoms showing each July to August, and fall leaf drop about a month ahead of healthy oaks, BLS may be present.

How can I diagnose bacterial leaf scorch?

BLS can be easily mistaken for other environmental, disease, or cultural problems. Diagnosis cannot be based on symptoms alone. Oak wilt, drought stress, unfavorable site, construction damage, improper planting, girdling roots, root and butt rot, and canker fungi can all cause symptoms similar to those of BLA. Submitting a sample to a plant diagnostic laboratory is the only way to definitively diagnose the disease. Late summer or early fall is the best time to test for BLS, because this is when *Xylella fastidiosa* is most active and bacterial populations are high in the tree's water conducting tissues. Testing for this disease too early in the growing season can result in false negative results.

Testing for BLS at the U of I Plant Clinic

The ***U of I Plant Clinic*** will be testing for BLS at the end of the month. The fee will be \$25 per sample. It is suggested that you call ahead to be certain you have prepared the correct sample and avoid resampling at your expense. **Petiole tissue from symptomatic leaves is preferred for this test, so leaves showing symptoms with green petioles are the usual request.** Please send your samples in the next several weeks. We will collect samples, store them, and then run ONE serological test on all the submitted samples at the end of August, 2014.

What is the management of BLS?

There are no effective control options available once a tree is infected with BLS.

- Insecticide treatment of the insect vector is considered impractical and is not recommended.
- Trunk injections with antibiotics have been found to suppress symptoms, but will not eradicate the disease. Treatments can be done each year into the root flare at the base of the tree in late May or early June. Research has shown that injections are not an effective long-term solution for this disease. In addition, research has also shown that injection holes can be an entry way for wood rotting organisms and frequent retreatment can cause considerable damage over the life of the tree.
- Pruning can be done to help the aesthetics of the tree for a few years but has not been shown to slow the disease development.
- Mulching and watering during times of drought may help to prolong the life of the tree.
- The effects of fertilization are still not clear with this disease.
- Tree replacement with a non-susceptible host to BLS before the tree infected with BLS is removed is recommended. Some trees that have not been found to be affected by BLS can be found at the following http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-OR-W-12.pdf. Removing the tree infected with BLS may be necessary for safety.

Other BLS Fact sheets:

<http://www.usna.usda.gov/Research/BacterialLeafScorch.html>

<http://pubs.ext.vt.edu/3001/3001->

1433/3001-1433.html
http://www.hgic.umd.edu/_media/documents/publications/bacterial_leaf_scorch.pdf
<http://ohiodnr.com/Default.aspx?tabid=22670>

(Travis Cleveland & The University of Illinois Plant Clinic)

Emerald Ash Borer

Emerald ash borer has been found recently near Dunlap and in Peoria in Peoria County. It has also been found recently in Minier in Tazewell County. Peoria and Tazewell counties are just outside of the present quarantine boundary, so it will be expanded to include those counties.

New county infestations earlier this year within the existing quarantine boundary include Savanna in Carroll County, Freeport in Stephenson County, and Danville in Vermilion County. It is now found in 36 Illinois counties. We reported it being found in St. Charles, Missouri earlier this summer. St. Charles is just northwest of St. Louis, causing concern for areas in Illinois east of the St. Louis area.

The second edition of "Insecticide Options for Protecting Ash Trees from Emerald Ash Borer" has been published this year and is available at http://www.emeraldashborer.info/files/multistate_EAB_Insecticide_Fact_Sheet.pdf. It provides an update of brand names of labeled insecticides to control emerald ash borer and additional information on the effectiveness of insecticides.

The national 2014 Emerald Ash Borer Research and Technology Development

Meeting will be held on October 15-16, 2014 at the Ohio Agricultural Research and Development Center (OARDC) in Wooster, Ohio. This is an excellent opportunity to get the latest information on Emerald Ash Borer through oral and poster presentations.

Attendance is limited to the first 225 people that register. The deadline to submit paper and poster titles is September 26, 2014. The registration fee is \$50. Additional information including registration and lodging information is at <https://www.regonline.com/builder/site/?eventid=1590583>. *(Phil Nixon)*

Japanese Beetle

Populations of adult Japanese beetle continue to be light in most of Illinois. Although leaf feeding damage on linden, crabapple, rose, and other trees and shrubs is obvious in some areas, the amount of damage is less than in most years and not as widespread.

The reduced number of adult beetles should translate into fewer eggs laid in turf. The combination of fewer eggs resulting in fewer white grubs and continued timely rainfalls in most of Illinois should result in less white grub injury to turfgrass this year. However, there are spotty areas of drought in Illinois this summer so turf managers in those areas should be more watchful for white grubs and their damage.

Now is the time to be scouting for white grubs throughout the state. The eggs have hatched so there are grubs to find, but they will be too small until mid to late August to eat enough roots to cause dieback.

Cut through the turf with a sturdy knife, I like to use a folding outdoor knife. Select an area where white grubs have been previously, areas that are damper, or the edges of brownish areas. Cut about a one-foot square on three sides, and pull back the sod. In moist soil, the white grubs will be obvious on the soil surface where they have been feeding on the roots of the grass. Look for grubs hanging onto the underside of the sod, and till the upper three inches or so of the soil with the knife blade to flip any deeper grubs onto the soil surface. In dry soil, the grubs will descend downward to where the moisture is located, so they are likely to be four to six inches deep.

Ten to twelve grubs per square foot are enough to cause damage. Heavily used turf, is damaged by fewer grubs, about eight grubs per square foot. Lightly used turf can have fourteen or more grubs per square foot without showing die-back. Even one to three grubs per square foot are attractive enough to raccoons, skunks, and insectivorous birds to result in digging damage.

High grub numbers can still be reduced to non-damaging levels with an application of trichlorfon (Dylox) or chlorantraniliprole (Acelepryn). Imidacloprid (Merit), thiamethoxam (Meridian), and clothianidin (Arena) are also effective, but the grubs may not die for two to three weeks. All grub insecticides provide better control if watered in with at least one-half inch of water. (*Phil Nixon*)

Spruce Bud Scale

We have been seeing more spruce bud scale problems this year in Illinois. It is

well-named, as the scale is located at the base of twigs and is similar in appearance to swollen buds. Mature scales are reddish-brown and rounded, about one-eighth inch in diameter. They commonly are coated with a whitish bloom.

Needles on attacked spruces are light green to yellow which eventually drop from the tree. Twigs, branches, and even entire trees can be killed. Lower branches and twigs are much more likely to be attacked than the upper part of the tree. The scale is more common on stressed, unthrifty trees than healthy trees. The drought of 2012 may have caused the current increase in the state.

Spruce bud scale is a soft scale, so it produces large amounts of honeydew. Black sooty mold grows on the honeydew. A good way to scout spruces with off-color needles for spruce bud scale is to look for blackened twigs and needles from sooty mold. Then check twig crotches for scale.

Crawlers are produced in mid-summer when *Hydrangea arborescens* 'Grandiflora' blossoms begin to turn from white to green. There is one generation per year. Effective crawler sprays include insecticidal soap, summer spray oil, bifenthrin (Onyx), cyfluthrin (Tempo), and acephate (Orthene). Because this scale does not mature until spring, treatment at this time of year may provide some control and save trees that are too heavily infested to survive until crawler hatch next year. Dormant oil sprays during the winter may also provide some control. Spray oils are likely to discolor foliage. (*Phil Nixon*)