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# PLANT DISEASES

## 2007 Bacterial Leaf Scorch Finds

Bacterial leaf scorch (BLS) is a disease associated with decline and death of large trees. It is caused by a bacterium, *Xylella fastidiosa*, which resides in the xylem. Unlike most other bacterial plant pathogens, this one cannot be detected in an ooze test with a microscope or cultured on lab media. Positive finds are confirmed by ELISA (enzyme-linked immunosorbant assay). We have discussed this disease in the *Home, Yard, and Garden Pest Newsletter,* issue no. 15, 2007, or issues no. 14 and 16, 2006.

The most frequent hosts of this disease in the United States include elm, oak, sycamore, mulberry, sweetgum, sugar maple, and red maple. In Illinois, we have identified the problem on oak, specifically pin, red, shingle, bur, and white oaks.

In 2007, to date, the Plant Clinic assayed 22 Illinois samples for *Xylella fastidiosa (Xf).* Of these, 11 tested positive: 4 pin oaks, 3 red oaks, 1 shingle oak, and 3 oaks of unknown species determination. Interestingly, all were from Champaign County. We tested samples from Douglas, DuPage, Jefferson, Kankakee, McHenry, and Sangamon counties; all were negative. Keep in mind that we test only what is sent to us, so this information is not a survey of the disease in Illinois. *(Nancy Pataky)*

## Tree Disease Predictions for 2008

If I had a crystal ball, I would tell Illinois arborists exactly what tree diseases would be a problem in 2008. I don't have such a device, so I will have to rely on some educated guesses. It is not difficult to predict that we will see all of the same diseases we see every year; but the question is, which ones will be most intense? I have chosen a few of the more common problems seen at the U of I Plant Clinic, as well as a few that are just plain bothersome.

Ash decline has been a problem in Illinois for at least 20 years. And although many like to blame that decline on *Verticillium*, none of the 14 Plant Clinic isolations from 2007 ash samples yielded that fungus. Drought, compaction, drainage problems, and herbicides are common factors in ash decline. Decline initially appears as branch tip death and "thinning" of foliage over the entire tree. This decline occurs over many years, with temporary recovery each spring. I expect ash decline to continue to be a major tree disease problem in 2008. Although emerald ash borer threats have greatly reduced planting of new ash trees in Illinois, we still have a great number of ash trees in the state.

There are many river birch *(Betula nigra)* trees in Illinois landscapes. Although this tree is more disease resistant than most birches, it is sensitive to high-pH soils, often developing chlorosis and other nutrient-stress symptoms. That condition, along with moist weather, predisposes trees to anthracnose infection, resulting in loss of inner leaves. Botryosphaeria and Phomopsis cankers follow and contribute to branch decline and death. Expect problems with chlorosis and cankers in central and southern parts of the state next season, following drought experienced in those areas.

Verticillium wilt is known to be worse on stressed trees. At the Plant Clinic, we have seen most cases on catalpa, magnolia, maple, redbud, smoketree, and fragrant sumac. I don't imagine that will change in 2008. For these tree species, you might want to consider a little extra TLC to avoid stress and predisposition to *Verticillium* infection or spread. For areas in drought in 2007, consider watering weekly, now until the first hard frost.

Dutch elm disease is still with us. Healthy elm trees are most likely escapes rather than resistant species. Still, don't forget to consider other factors when elms are in decline. In 2007, only 11 of 27 elm samples submitted to the Plant Clinic for DED testing proved positive. Site stress may be involved in tree decline; or possibly elm yellows is becoming more prevalent. The Plant Clinic cannot test for elm yellows. Confirmation usually involves extracting DNA from a diseased plant, amplifying a DNA fragment by polymerase chain reaction (PCR), and identifying it. Such procedures are fairly expensive due to labor and equipment costs. Some specialty labs, such as AGDIA, Inc., offer this service. Details can be obtained at www.agdia.com.

All species of maples grown in Illinois are susceptible to *Verticillium;* and we see a good number of positive confirmations at the Plant Clinic each year. Still, other factors are contributing to maple decline, including deep planting, potato leafhopper stress, soil pH problems, drainage, and compaction. Watch for more maple decline in 2008, as many of these stress factors were common in 2007.

Easily the most common Illinois evergreen disease in the last few years, Diplodia (Sphaeropsis) blight is at the top of my list for 2008. Infection has become so widespread

that inoculum is common in most areas of the state, and infection requires only a succulent shoot to be exposed to a wet period of 12 hours when temperatures do not go below 54°F. That happens each spring in Illinois. To make matters worse, drought-stressed trees are more susceptible.

Spruces in Illinois are commonly infected with Cytospora canker and Rhizosphaera needle cast. *Cytospora* is a stress pathogen and will be with us as long as spruces exist. *Rhizosphaera* infects in wet periods from spring to fall, but needle drop occurs as much as 12 to 18 months later. Because moisture was more abundant in northern Illinois in 2007, I predict *Rhizosphaera* will be more of a problem there in 2008.

I have left oaks for last because they are now threatened by two fatal diseases. Oak wilt is not hard to predict. It has been a fairly steady disease problem on oaks submitted to the Plant Clinic for the last two decades. Oak wilt infection does not seem to be weather dependent; however, we would not be surprised to see it more frequently on oaks in stress situations. I don't expect the oak wilt situation to worsen, but even a steady appearance of this disease is not good news.

Bacterial leaf scorch (BLS) is the disease I suspect is more prevalent in Illinois than most imagine, especially on oaks. The symptoms look much like environmental scorch except distribution increases in a tree from year to year, symptoms don't show until mid to late summer, and temporary recovery occurs each spring. We have found many positive cases around Champaign, but scattered cases show this is a threat elsewhere in the state.

Possibly I have been a bit conservative on the predictions for 2008, but weather and site stress will play a huge role in disease appearance; and I don't have the aid of a crystal ball. If you would like more information on the diseases mentioned here, consult the *Report on Plant Disease* series of fact sheets *(RPDs)* available in Extension offices in Illinois or free on the Internet at http://www.ag.uiuc.edu/%7Evista/horticul.htm. *(Nancy Pataky)*

# INSECTS

## Whiteflies

There was an extensive article about outdoor whiteflies in issue no. 15, August 13, 2007. These insects have become more numerous in Illinois over the intervening weeks. Most appear to be silverleaf whitefly, *Bemisia argentifolii*, although identification of the adults is difficult. Adult whiteflies are very small, with six or more easily fitting on the head of a straight pin. They are covered with a white dust and fly readily when foliage is disturbed.

Although these adults are undoubtedly feeding by sucking the sap from leaves of various plants, no leaf distortion damage has been noticed. The silverleaf whitefly is a tropical to subtropical species. There does not appear to be any reproduction occurring. This is probably due to this species' needing temperatures over 60°F to reproduce. The nymphs die at temperatures below 48°F. All stages die at temperatures below 23°F, explaining why this species does not overwinter in Illinois.

Treatment is not likely to be warranted. However, if you have clientele who are bringing houseplants indoors that have been sitting outside this summer, these plants should be sprayed with insecticidal soap if there are whiteflies on them. *(Phil Nixon)*

## White Grubs

There have been numerous reports of white grubs and associated damage in northeastern Illinois. Although there were heavy flights of Japanese beetles in both northern and southern Illinois, white grub damage appears to be spotty in southern Illinois. Japanese beetle eggs die at soil temperatures over 90°F; and high temperatures coupled with very dry conditions in southern Illinois probably account for the lack of damage. Also, Japanese beetle grubs need 11 inches of rainfall or irrigation through the late summer and fall. Dry soils in southern Illinois have probably killed many of the resulting grubs that did hatch.

People in northeastern Illinois are questioning whether they have masked chafer grubs, annual white grubs, or than Japanese beetle grubs. Masked chafer grubs better survive the dry soil conditions that northeastern Illinois has experienced. However, masked chafers are typically reduced when Japanese beetle moves into an area.

I have not seen any grubs from northeastern Illinois. I will be happy to identify any that are sent to me. To preserve the grubs, drop them into boiling water, immediately fish them out, and put them into rubbing alcohol.

Regardless of the species, trichlorfon (Dylox) should provide control. If the soil is dry, irrigate 2 to 3 days before treatment to bring the grubs up into the root zone, where the insecticide can be effective. Water the Dylox in with at least 1/2 inch of water. The grubs can be effectively treated if they are in the root zone. Japanese beetle grubs migrate downward into the soil for the winter when the root zone temperature drops below 60°F. Masked chafer grubs migrate downward when the root zone temperature drops below 50°F. *(Phil Nixon)*

## Magnolia Scale

Magnolia scale is common in northern Illinois and occurs sporadically in the rest of the state. It attacks star magnolia, *Magnolia stellata;* cucumbertree magnolia, *M. acuminate;* saucer magnolia, *M. soulangiana;* and lily magnolia, *M. quinquepeta.*

Magnolia scale females can be very large for scales, about 1/2 inch in diameter. They range from yellowish to brownish, from oval to a roundish blob. Magnolia scale produces large amounts of honeydew, resulting in shiny, sticky leaves, as well as sticky sidewalks and cars underneath infested trees. Tree sap is very low in nitrogen, so soft scales

consume great quantities of it, separate out much of the water and nitrogen, and excrete most of the remainder as the concentrated sap, or light syrup, called honeydew.

Mature females at this time of year produce living young. These first-stage nymphs, or crawlers, are oval and gray, with a reddish brown ridge running down the back. Each crawler has two white, waxy spots, one on each side. Crawlers mass on the undersides of 1- and 2-year-old twigs for the winter. From the time that they emerge from the female until they molt to the second nymphal instar in late April or early May, they are vulnerable to insecticide sprays. In early June, they molt again to the third-instar nymphal stage and are deep purple. Heavily infested twigs and branches appear purple and rough from the high scale numbers. The nymphs then produce white, powdery wax that covers their bodies. As they mature to adults, the white wax wears away, being heaviest on the edges of the scale. There is one generation per year.

An insecticidal spray of acephate (Orthene), insecticidal soap, or summer spray oil at this time controls the crawlers. The same sprays at bud break in the spring are also effective. With the insecticidal soap and summer spray oil, be sure to get good coverage, particularly on the twig undersides, where the crawlers will be most numerous. As these are contact insecticides, the insects not hit directly with the soap or oil spray will probably survive; so thorough coverage is essential. *(Phil Nixon)*

## Chinch Bug

We have received reports of chinch bug damage in northeastern Illinois. Several species occur in the United States, and they tend to attack grasses, which makes them serious pests in some areas on grain crops, particularly wheat. In Illinois turf, we primarily have two pest species: Hairy chinch bug, *Blissus leucopterus hirtus*, is a sporadic problem in the northeastern and elsewhere in northern Illinois; and chinch bug, *Blissus leucopterus leucopterus*, is a more common problem in the Collinsville area, as well as other areas of southern Illinois. With the dry weather now in southern Illinois, be watchful for this insect. Chinch bugs are rarely a problem in central Illinois.

Chinch bugs overwinter as adults at the base of turfgrass plants and other grasses in fencerows and other protected areas. Adult chinch bugs are about 1/8 inch long, flat-topped, and black and white. Some are winged, but others are wingless or have short wings that extend about halfway down the back. They fly and crawl to turf, where they feed by sucking sap out of turfgrass crowns and stems. Eggs are laid on the turfgrass and on the ground nearby.

The eggs hatch into nymphs that are red and white. When the nymphs are half-grown and about 1/16 inch long, the red turns orangish, then brownish, and then gray by the time they are fully grown and about 1/8 inch long. Nymphs feed as the adults do—by sucking sap from the crowns and stems of turfgrasses. Fully grown nymphs molt into adults, and usually another generation occurs later in the summer. Adults from the second generation seek overwintering sites during the fall.

Damage appears as yellowed turf that soon turns brown, with continued feeding by the chinch bugs. Infestations are usually associated with hot, dry weather, probably because a naturally occurring fungus that is a major cause of chinch bug death is probably more widespread and common in damp weather. Damage appears to be more likely in heavily fertilized turf. High chinch bug numbers are usually found in thick, lush turf that has been heavily fertilized with nitrogen.

Scout for chinch bugs by looking for the adults or nymphs at the base of turfgrass that is yellowed or brown during the growing season but is well-rooted. Because chinch bugs can be flushed out of turf, push a coffee can or similar container with both ends cut out down into the thatch. Fill the can with water. Within 5 minutes, any chinch bugs present should be floating on the surface of the water. High numbers of floating chinch bugs forming a solid ring around the inside of the can indicate that they are probably the source of the damage and that treatment is warranted.

Control chinch bugs by spraying the turf with trichlorfon (Dylox) or a labeled pyrethroid, such as bifenthrin (Onyx, Talstar, Allectus), deltamethrin (DeltaGard), or lambda-cyhalothrin (Scimitar). Make sure to use enough spray to wet the crowns of the turf, where the bugs tend to live. Where chinch bugs have been a problem, avoid high fertilization programs, particularly those containing high levels of nitrogen. Endophyte-containing turfgrasses are also effective in reducing chinch bug numbers. *(Phil Nixon)*

## Black Cutworm

Black cutworms are numerous on golf course greens and on some lawns throughout Illinois. They overwinter in the southern United States, and the moths fly up into Illinois in the spring. Black cutworms have multiple generations per year, continuing well into the fall. It was thought that these insects, along with numerous other species, die off as cold weather arrives. With the advent of Doppler radar, miniaturized radio transmitters, and other technology, we now know that at least some of these species migrate south in the fall, as monarch butterflies have been known to do for decades.

As the season progresses, additional moths migrate from more southern states, and those that have already arrived go through successive generations. These factors result in increasing numbers as we go through the growing season. By now, populations are very high.

Black cutworm larvae grow well on creeping bentgrass, perennial ryegrass, and tall fescue, with over 80% growing up to pupate. Almost as many survive on varieties of

grasses that contain endophytes. On Kentucky bluegrass, fewer than 10% of the larvae survive. As a result, damage is heaviest on greens and other golf course areas planted to bentgrass. In home lawns, even those planted to tall fescue and perennial ryegrass, damage is not as easily noticed because of the height of cut.

Damage on greens appears as circles 2 to 3 inches in diameter where the grass blades are eaten down to the crowns. Frequently, there is a shallow hole in the center of the circle. Cutworm caterpillars feed at night, tending to feed in a circle, as far as they can reach, with their posterior end frequently inserted in a shallow hole. These damaged areas are most numerous within 30 or so feet from the green apron because the cutworms like to hide in the taller turf around the green during the day, commuting onto the green at night to feed. Feeding damage looks like ball marks where a golf ball skipped across the green, rubbing off the grass blades. Thus, golfers do not recognize the damage as being caused by an insect.

More serious damage is caused by insect-feeding birds, such as starlings, robins, grackles, cowbirds, and blackbirds. In feeding on the cutworms in the early morning, they pull up a small divot 1/2 to 1 inch across. These little divots are large enough to deflect putts, causing golfers to get upset. The sand in these divots also quickly wears the edge of greens mowers blades, causing the blades to require sharpening and replacing more often.

Damage to lawns is frequently hidden by the taller grass, although lawns may have irregular, roundish, brown areas where the green grass blades have been eaten, revealing the thatch. More commonly, bird damage is obvious. Because lawn turf is rooted deeper and more firmly, it is unlikely to be pulled out by the birds as occurs on golf greens. Instead, round holes about 1/2 inch in diameter are punched through the turf by the birds' beaks as they search for larvae. Lawns with many cutworms look dingy from a distance due to the brownish to blackish holes where the underlying soil shows.

Black cutworm larvae are dark-colored and heavy-bodied. They can be flushed from the turf with a teaspoon of 5% pyrethrum or 1 tablespoon of dishwashing detergent in a gallon of water. Distribute this evenly over a foot square of turf; a watering can works well. Within a couple of minutes, the irritated larvae come up onto the turf surface. Only two to three cutworms per foot square are enough to result in noticeable injury. An application of bifenthrin (Talstar), carbaryl (Sevin), deltamethrin (DeltaGard), halofenozide (Mach 2), spinosad (Conserve), or trichlorfon (Dylox) controls the caterpillars. Insecticidal nematodes are also effective.

Cutworm moths lay their eggs near the tip of grass blades, so frequent mowing and clipping removal reduce caterpillar numbers 75 to 97%. Dump clippings baskets well away from greens and other bentgrass areas. Over 90% of the eggs survive the mowing process, so dumping the clippings at the green apron results in caterpillars that can easily attack the green. Homeowners who collect grass clippings and use them to mulch around vegetable plants and flowers concentrate the eggs into smaller areas, resulting in heavy feeding damage from the resulting larvae to their garden plants. Top-dressing the green with sand also reduces the number of cutworm larvae. *(Phil Nixon)*

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