UNIVERSITY OF ILLINOIS EXTENSION
HOME, YARD & GARDEN PEST NEWSLETTER
College of Agricultural, Consumer and Environmental Sciences, University of Illinois at Urbana-Champaign
Illinois Natural History Survey, Champaign

No. 7• June 4, 2003

PLANT DISEASES

Oak Skeletonizer

We have seen this problem on white oaks for the past 5 or 6 years. In early spring, the foliage of white oaks appears "eaten," with only the green veins remaining. The tissue that remains is the vein tissue and a bit of leaf blade around the veins. The edges of the leaf that remain are often brown or thickened like a callous tissue. Leaves look like what you might expect if a hoard of hungry locusts were to eat their way through the landscape. Insects, though, are not thought to be involved. We have seen this happen only on white oaks and occasionally on hackberry, leaving other nearby oak species unaffected. Often the problem appears in the middle of an oak grove where there are a few white oaks. Some names to refer to the condition include oak tatters, oak skeletonizing, and bare bones.

What is the cause of this condition? No one seems to know for certain. It has been suggested that this could be the result of cold injury when the leaves were still in the bud. Look closely at the leaves. The injury appears to be nearly symmetrical, as is often the case with injury that occurs in the bud. Because the injury is so bizarre, many think that herbicides are involved. We cannot perform chemical-residue tests at the clinic, but symptoms do not fit those typical of plant-growth-regulator chemical injury. In all cases where other plant materials are growing nearby, only the oaks are affected; and sometimes one oak is affected while nearby oaks do not show symptoms. Herbicides might not be so discerning. There is still much speculation that herbicides are part of the story. Anthracnose is not to blame for this condition although anthracnose fungi might also be present in the necrotic tissue that is sometimes present.

There is some preliminary investigation into this problem being conducted at the University of Illinois. Funds are limiting for this sort of research, so work may not progress too rapidly. I will notify readers of any helpful information to which I am privy.

We hear most complaints of this condition from areas near farm fields as opposed to urban areas. The few people who have made follow-up comments have stated that leaves formed after this injury were normal. In other words, the trees appeared to recover. Although one year of such damage is not a threat to a mature oak, chronic injury may weaken the tree and predispose it to other problems, such as cankers, borers, oak wilt, to name a few.

What action do we suggest? Try to improve tree vitality so that the tree can continue to produce new leaves. For young trees, this usually means watering the tree in periods of drought, removing dead wood, and fertilizing with a general tree fertilizer in the early spring or late fall. If you have a healthy, old oak tree with these symptoms, leave it alone. We will keep you posted as we learn more about this condition.

The USDA Forest Service has a pest alert called "Oak Tatters." The publication number is NA-PR-02-00. This is easily found in an Internet search using "oak tatters" as the search word. *(Nancy Pataky)*

Leucostoma (Cytospora) Canker of Spruce

Most canker diseases we see in the landscape are caused by fungi. They often have an imperfect (conidial) stage that is most common during the growing season and a perfect stage, usually found in the dormant season for the plant. Both are helpful to diagnosticians trying to make a positive identification of the fungus, but multiple names can be confusing to nonpathologists. This common canker disease of spruce in Illinois is caused by a fungus named *Leucostoma kunzei*, formerly called *Cytospora kunzei*. The perfect stage of the fungus is *Valsa kunzei*.

Leucostoma canker is probably the most common and damaging infectious disease of spruce in Illinois. Colorado blue and Norway spruces are very susceptible, especially 10- to 20-year-old trees. This disease appears on spruces as dead or dying branches, usually starting at the base of the tree and moving upward. Occasionally the affected branches are scattered throughout the tree. The needles may drop early from affected branches or hang on for several months, leaving dry, brittle twigs. An important diagnostic feature to notice is that *Leucostoma* causes entire branches to die, including branch tips. A girdling canker forms at the base of the branch, and symptoms show first as a branch tip death. Sometimes this dis-

ease is confused with Rhizosphaera needle cast, which affects older needles first, while needles at the tips of branches are apparently unaffected. (Refer to issue no. 3 of this newsletter for details about Rhizosphaera.) *Leucostoma* can continue to spread until all the branches on the tree are dead. Conspicuous patches of white resin commonly form on the bark in cankered areas at the base of dead branches. The diseased tissue is brown under the thin layer of outer bark. Black, pinheadsized fruiting bodies of the fungus (pycnidia) form in the inner bark, often embedded in the resin. They can be hard to find without the aid of a dissecting microscope.

Don't be fooled when diagnosing Leucostoma canker. The mere presence of dead branches does not confirm the disease. Look for resin areas at the base of the dead branches. Then look more closely for the black pycnidia. We have seen so much damage to spruce from environmental stress over the past several years that it is possible that injury has nothing to do with an infectious agent. On the other hand, stressed spruce trees are more susceptible to Leucostoma canker, and it is highly likely that the disease will eventually invade the stressed tree as a secondary pathogen. You can find this disease in most Illinois communities with older spruce trees.

There are no chemical controls to prevent or eradicate this disease. Remove dead branches as they occur, but be certain to wait for dry weather for this pruning. Try to improve tree vitality by watering in drought-stress periods. It may be helpful to apply an organic mulch under the full spread of the branches but not up against the trunk. Mulch helps retain moisture and maintain a more even temperature and moisture environment for the roots. For more information on Cytospora or Leucostoma canker of spruce, consult *Report on Plant Disease (RPD),* no. 604, available on the VISTA Web site or through your Extension office. *(Nancy Pataky)*

Watch for Dutch Elm Disease

There are still many elms in Illinois, so be aware of this lethal disease. Some growers assume that a mature, healthy American elm must be resistant, as it did not succumb to infection when Dutch elm disease was rampant in the 50s. It is more likely that the tree is an escape, luckily avoiding infection via beetles.

Dutch elm disease (DED) is caused by a fungal pathogen, *Ceratocystis ulmi,* which causes plugging of vascular tissues and resultant wilting and death of foliage, much as we see with oak wilt or Verticillium wilt. American elms are very susceptible to the DED pathogen. Although Chinese elm and Siberian elm are known to be more resistant, infection of these species may occur as well. Work is still under way to develop resistant elms. So far, research has produced the more resistant Sapporo Autumn Gold, American Liberty, and Urban elms. Some of this research is being conducted at the U.S. National Arboretum near Washington, D.C. Other work is being done at the Morton Arboretum in Illinois, with some selections available through the Chicagoland Grows, Inc., program. Refer to issue no. 2 of this newsletter for information on disease resistance.

Watch for yellowing of the leaves in the elm, followed by wilting and browning. Often this happens so quickly the problem is first noticed when branches with brown leaves appear in the canopy "overnight." A single branch usually shows symptoms first (called flagging), with rather rapid spread to adjacent branches and the entire tree. Look for vascular discoloration to help with diagnosis of this disease. As with oak wilt, DED causes a streaking of the sapwood. Peel back the bark of a symptomatic branch to reveal the brown streaks in the otherwise tan outer sapwood. We generally select branches of about thumb thickness with wilted leaves. Verticillium wilt and Dothiorella wilt can also cause this streaking in elm.

Positive identification requires laboratory culturing of the fungus. Cut several 6- to 8-inch-long sections from wilting but living branches that show definite streaking in the sapwood. The fresh wood sections should be thumb thickness and can be sent in plastic or foil to the Plant Clinic for testing. Chilling the wood should not be necessary with Dutch elm suspect samples. Expect about 7 days of lab time for the fungus to grow to the point where it can be positively identified. The fee for this service is $12.50. Remember, payment must accompany the sample, or it will not be processed.

For more information on DED, including control procedures, consult *Report on Plant Disease (RPD),* no. 647, available on the Extension's VISTA Web site. It is generally too late to save a tree once it is infected, but an accurate diagnosis may help save nearby elm trees. A similar disease caused by a phytoplasma is discussed in *RPD,* no. 660, "Elm Yellows or Phloem Necrosis and Its Control." *(Nancy Pataky)*

INSECTS

Potato Leafhopper

Potato leafhopper, *Empoasca fabae,* is being found in Illinois, with numerous populations in southern and central Illinois on ornamental plants. Potato leafhoppers attack many landscape trees, including crabapple, birch, ash, and maple. Red maples are highly suscep-

tible, whereas silver, sugar, and Norway maples are more tolerant.

Potato leafhoppers have piercing–sucking mouthparts, which they use to feed within the vascular tissues of plants. During feeding, potato leafhoppers inject a toxic fluid into plant tissue. Feeding, especially on maples, results in stunted tree shoots and leaves that curl downward, with brown edges. On other plants, such as ash, feeding creates small white or yellow spots on leaves, resulting in a stippled appearance because potato leafhoppers, like spider mites, remove chlorophyll (green pigment). Potato leafhoppers don't overwinter here because their eggs are sensitive to cold temperatures. They winter in the Gulf of Mexico and are blown north into Illinois by prevailing winds from early May to early June.

Potato leafhopper adults settle into alfalfa fields during the spring migration; and after the first cutting of alfalfa, they migrate onto ornamental plants. Adults are small (about 1/16 inch long), wedge-shaped, and pale green, with white eyes. Females lay eggs into the veins on the underside of leaves. The eggs hatch in 6 to 9 days into light green nymphs that are found on the underside of leaves and tend to move sideways when disturbed. Nymphs may undergo five instars before molting into adults. Adults and nymphs are similar in appearance except that the adults are larger, have wings, and can fly. The wings are held rooflike over the body. Empty, white, cast skins on the underside of leaves provide evidence of potato leafhopper activity. There may be as many as three to five generations per year.

Insecticides must be applied before potato leafhoppers cause plant damage. Control can be obtained with pyrethroid-class insecticides, such bifenthrin (Talstar), cyfluthrin (Tempo), lambda-cyhalothrin (Scimitar), and permethrin (Astro). If damage has already occurred, insecticide applications prevent further damage, and new growth appears normal beyond the damaged leaves. Regular scouting helps minimize the potential for potato leafhoppers to cause severe foliar damage. *(Raymond A. Cloyd)*

Periodical Cicada

Periodical cicada is set to emerge in the Chicago area and should do so by early June. Periodical cicadas feed for years as nymphs on the sap of roots of trees and shrubs. From central Illinois south, they emerge aboveground on the 13th year, molt into adults, and reproduce. From central Illinois north, they emerge on the 17th year. This year's is an unusual emergence pattern that started in 1969, when part of the northern Illinois brood emerged after 13 years in northeastern Illinois instead of 17 years. Since then, this group of cicadas has emerged every 17 years, so there was an emergence in 1986 and will be one again this year. In 2007, northeastern Illinois will experience the rest of the emergence of this brood, along with most of the rest of the northern third of Illinois.

We expect the periodical cicadas to emerge through much of the Cook County suburbs, the eastern half of DuPage County, southeastern Lake County, and northeastern Will County. The expected emergence is a curved band running from Deerfield on the northeast, arcing to Addison and Lisle on the west and Crete on the southeast. The inside of the band arcs across northwestern, western, and southwestern Chicago.

Full-grown nymphs are brown, humpbacked, and about 3/4 inch long. They commonly construct soil chimneys that extend from the ground up to 3 inches high and are about 1/2 inch in diameter. These chimneys have been reported in the last part of May this year in the expected emergence area. Chimneys are not always constructed. Within a few days, nymphs break through the top of the chimneys or soil surface to crawl up trees, shrubs, and other upright objects, where they molt into adults. Adult periodical cicadas are about 1-1/4-inch-long, black insects with red eyes and orange-veined, clear wings.

Males produce a high-pitched wavering song that sounds like a trill when many are singing together. They sing primarily during the sunny part of the day to attract females to them for mating. The males and the singing die after a couple of weeks, while females remain alive for 2 to 4 weeks longer to lay eggs. Eggs are inserted into tree and shrub stems that are up to 2 inches in diameter. Heavy egg-laying causes twigs to break, resulting in dead leaves at the end of branches. Small trees may have enough eggs laid into the trunk that it breaks off.

Control is directed at preventing egg-laying damage, as adult feeding is insignificant. Although pyrethroids and carbaryl (Sevin) kill large numbers of adults, treated plants commonly experience about as much injury as untreated plants in landscapes and small planting areas. In nurseries and other large planting areas, repeated applications can reduce the damage significantly. Individual trees can be protected with nylon netting or wire screening tied around the trunk and larger branches. Make sure that the netting or screening stands out from the trunk so that the cicadas cannot reach the stem with their ovipositors. Although damage to small branches is obvious, its long-term effect is to make the plant bushier and is not usually worth control efforts.

Eggs hatch within a few weeks into small nymphs that drop to the ground and tunnel down to find a root to feed on. Over the years, nymphs commonly move

to different roots but do not migrate very far. Nymphs have little effect on tree health, although studies have shown reduced diameter growth in trees during the 2 to 3 years before adult emergence. Because larger insects eat more than smaller ones, the older, larger nymphs apparently eat enough sap to reduce growth.

We are interested in tracking this emergence. I would appreciate knowing where these cicadas are found. Contact me by e-mail, pnixon@uiuc.edu; phone, (217)333-6650; or mail, S-408 Turner Hall, 1102 S. Goodwin, Urbana, IL 61801. *(Phil Nixon)*

Scouting Watch

Euonymus scale crawlers emerge and are susceptible to treatment when catalpa is in early bloom, now occurring in southern and central Illinois. The crawlers are lemon yellow in color, easily spotted on leaves. Pyrethroid and other contact insecticides, including insecticidal soap and summer spray oil, are effective.

Black vine weevil adults can be treated in southern and central Illinois and should be out near the end of the first week of June in northern Illinois. These insects feed as larvae on the roots of yew, strawberry, hemlock, and rhododendron. The adults eat notches from the leaf margins of the larval host plants, along with euonymus, clematis, and many other plants. The adults feed at night, hiding in debris below the plant during the day. Adult weevils are hard-shelled, gray, 1/4-inch-long beetles with scattered, indistinct, yellowish dots on the back. Only females are known, but they feed for 2 weeks before their ovaries mature and they can lay eggs. Control of the adults during these first 2 weeks is the most efficient way to avoid larval damage. Acephate (Orthene), bifenthrin (Talstar), and cyfluthrin (Tempo) sprayed heavily on the foliage so that it runs off under the plant are effective against the adults. Hb nematodes are effective against the larvae.

Dead **anthomyiid flies** are common this year. A fungus attacks these grayish, 1/4-inch flies. The fungus causes the fly to crawl to the tip of a leaf, branch, post, or other upright object, where the fly dies. Whitish hyphae soon emerge from the fly's body, making the fly look fuzzy. Presumably, the high location allows for the better dispersal of spores from the fungus. Although these flies may be numerous and very noticeable, they are not pests. *(Phil Nixon)*

Home, Yard, and Garden Pest Newsletter is prepared by Extension specialists from the University of Illinois at Urbana-Champaign and the Illinois Natural History Survey. Information is gathered with the help of staff members, Extension field staff, and others. Karel Jacobs and Donna Danielson of The Morton Arboretum also provide information and articles.

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