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Illinois Natural History Survey, Champaign

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PLANT DISEASES

Tattered Oaks

We have been receiving reports of tattered-looking oak foliage again this season at the University of Illinois Plant Clinic. We happened to look more closely at one of the oaks in the Plant Clinic lawn and found it was also affected.

"Oak tatters" is a term coined for a condition that has occurred for over 20 years. This is not environmental scorching, which results in brown to black leaf margins. Instead, we are talking about foliage that looks as though it has been "eaten" by an insect. Only the major veins and a bit of tissue around the veins remain intact. Soft tissues of the leaves appear to have been eaten by a starved insect. The foliage is not scorched or necrotic. What is left on the leaf is green. The foliage appears lacy and the canopy appears thinned.

We have heard reports of oak tatters in Illinois, Iowa, Indiana, Ohio, Michigan, Wisconsin, Minnesota, and Missouri. There are other problems that might resemble oak tatters. Anthracnose causes spring leaf damage but causes brown lesions on the foliage. This year has been a big year for anthracnose. Some insects cause similar damage, so look for the insects (usually caterpillars) or evidence of insects, including frass or webbing. Diseases and insects have been eliminated as causes of oak tatters.

Current research points to chemical injury as the cause of oak tatters. In 2004, three researchers at the University of Illinois did a preliminary study that indicated that drift of chloroacetamide herbicides (possibly from applications onto corn and soybean fields) was a possible cause of the leaf tatters syndrome. The researchers are Jayesh Samtani, John Masiunas, and Jim Appleby. An article describing their work can be found in the *Plant Health Progress On-line Journal,* February 2005, at http://www.plantmanagementnetwork.org/sub/php/brief/2005/tatters/. This work was repeated and will be reported early next year. The group submitted an article to the *Hort Science* journal just last week. Another publication is in preparation. I spoke with Masiunas, and he said that they have consistently recreated symptoms of tatters after applying chloroacetamide herbicides to both white oak and red oak. Some of you may have seen tatters on hackberry. These researchers are less certain of the situation with hackberries. According to Masiunas it is more difficult to spray at specific growth stages with that host. They have not recreated symptoms on hackberry.

There has been some concern that a tree repeatedly attacked by oak tatters might decline and even die. No evidence exists to confirm this theory, but the question merits investigation.

You may help your trees by following good horticultural practices to promote tree health, especially watering in periods of drought stress. For more information, visit the US Forest Service pest alert on tatters at http://www.na.fs.fed.us/spfo/pubs/pest_al/oaktatters/oaktatters.htm. *(Nancy Pataky)*

Anthracnose Abounds

I am not certain I could have predicted the extent of anthracnose we have seen on shade trees in Illinois this year. Because the anthracnose fungus thrives in wet weather and cool temperatures, initial infection was expected. Secondary infection does occur, but older leaves are less susceptible to infection by anthracnose fungi, and symptoms are usually masked by healthy new leaves in early June. Because growing conditions were cool for much longer than normal this spring, foliage was susceptible longer than normal. Required leaf wetness has been a common factor in much of Illinois as well. Consequently, we are still seeing sycamores with thinned canopies, and oaks, ash, and maples with many anthracnose lesions. Scattered brown lesions are typical of anthracnose. Sometimes the foliage is twisted or slightly distorted as the healthy growth continues to grow and the infected tissues shrivel.

Why do I have only one oak out of three in my yard that is affected with anthracnose? Why is my maple affected but not my oak? These are common questions concerning anthracnose. There are definitely differences in susceptibility to anthracnose by species and by individual trees. Selections for resistance in oaks and maples have not been reported. The disease may be aesthetically unpleasing in some years (like 2008), but that is not the case every year. In addition, the disease does not significantly affect tree growth. The *Platanus* species also vary in susceptibility. Severe disease has been reported on American planetree (sycamore), but oriental planetree is resistant. Hybrids and cultivars within a species sometimes show variation in resistance as well.

For more information on anthracnose of shade trees, read issue no. 4 of this newsletter or visit *Report on Plant Disease*, no. 621, "Anthracnose Diseases of Shade Trees," http://www.ag.uiuc.edu/~vista/abstracts/a621.html. *(Nancy Pataky)*

Slime Molds Expected

A few calls concerning slime molds have been received at the Plant Clinic. With the continuation of warm, wet weather that favors growth of slime molds, more calls are expected. Usually these molds are found growing on wood mulch, but they also frequent any living or non-living material close to the ground. They can be quite striking in appearance.

Although slime molds cause much concern to the homeowner, they do not absorb nutrients from live plant material. They feed on decaying organic matter, fungi, and bacteria in the soil and the turfgrass thatch layer. Bark mulches decompose with time, producing materials that the slime molds "consume." Slime molds may be white, gray, yellow, violet, blue, green, purple–brown, or black masses as large as 1 to 2 feet in diameter. This stage soon develops into colorful, crusty, fruiting bodies filled with masses of dusty spores.

Chemicals won't work against slime molds. Remove large spore masses in a plastic bag, and break up the remaining masses by vigorous raking or brushing. Although some like to hose down the spores with a stream of water, water can also spread the problem by spreading around the swimming spores. Raking affected mulch or wood chips helps the area dry out more quickly. Mowing the lawn usually removes the spore masses in turfgrasses. For more information about slime molds, read *Report on Plant Disease,* no. 401, "Slime Molds of Turfgrass," which discusses slime molds in turf. The publication is available in Illinois Extension offices or at http://www.ag.uiuc.edu/~vista/abstracts/a401.HTML. An excellent site with images of slime molds is http://botit.botany.wisc.edu/toms_fungi/june99.html. A fact sheet on slime molds by Cornell University can be found at http://plantclinic.cornell.edu/FactSheets/slimemold/slimemold. We usually see species of *Physarum, Fuligo,* and *Stemonitis. (Nancy Pataky)*

Invasive Species Spotlight: Sudden Oak Death (Phytophthora ramorum)

Sudden oak death (SOD), or ramorum blight, was first identified in the United States in 1995 in coastal forests in northern California. Since then it has spread to another relatively isolated area in southwest Oregon. It has also been identified in some areas of Europe; scientists are unclear as to the origins of this disease, which has been responsible for the death of thousands of western oak trees.

This disease is caused by *Phytophthora ramorum,* a "funguslike" organism that spreads by producing spores transported locally by wind and water or regionally through insect infestations and the sale and acquisition of ornamental trees and shrubs.

Some of the first symptoms of the presence of SOD (http://www.ppdl.purdue.edu/PPDL/pubs/SOD_pictorial_guide.pdf) include a dark red to black tarlike sap oozing from the tree's bark, and wilting and dieback of foliage and stems. Often, new branches re-sprout on the dying tree in large numbers but eventually wilt and die, too. Once the tree is in this state of decline, it is further susceptible to other insect and environmental problems like bark beetles and drought. An infected tree can die in as little as 1 year from these compounded problems. Although SOD has been found on other plants (http://www.aphis.usda.gov/plant_health/plant_pest_info/pram/downloads/pdf_files/usdaprlist.pdf) like rhododendrons and viburnums, it has not shown to be as certainly fatal to them. Serving as hosts for the pathogen, these plants may suffer leaf spot and twig blight.

Two common oak trees in Illinois, northern red oak *(Quercus rubra)* and northern pin oak *(Quercus paulustris),* are known to be extremely susceptible to this disease, which could lead to severe problems for the state. Invasive fungal diseases can be very dangerous. Although this disease has not yet been found in Illinois, it is of great concern for two main reasons. It has the potential to eliminate hosts–much of eastern North America is covered with deciduous forests that include oaks and shrub species that serve as disease reservoirs. Secondly, this pathogen infects several shrub species that grow in the wild and in domestic settings. Ornamental shrubs grown horticulturally could carry the disease to uninfected areas.

Several other pests and diseases can cause the decline of oak trees (http://www.na.fs.fed.us/spfo/pubs/pest_al/sodeast/sodeast.htm), but not many of them that are potentially as troubling as sudden oak death. All suspect trees should be properly diagnosed by pest-management specialists.

For more information, stop by the Illinois CAPS blog (www.illinoiscapsprogram.blogspot.com) for all the latest news on invasive pests in Illinois. *(Kelly Estes and Mike Garrett)*

INSECTS

Scouting Watch

Euonymus scale is in the crawler stage in northern Illinois and is susceptible to sprays of acephate (Orthene), bifenthrin (Onyx, Talstar), cyfluthrin (Tempo), insecticidal soap, and summer spray oil. If the lemon yellow crawlers are no longer present on the foliage, such as in

southern and central Illinois, acephate would be most likely to still provide effective control, due to its translaminar systemic action.

Mimosa webworm is present as first-generation larvae. Looking closely at the foliage will reveal two to three leaflets of honey locust or silk tree (mimosa) webbed together with a green or brownish caterpillar feeding between them. Apply acephate (Orthene), *Bacillus thuringiensis* kurstaki (Dipel, Thuricide), carbaryl (Sevin), spinosad (Conserve), or a labeled pyrethroid to obtain control. Control at this time prevents much more severe damage from occurring by the second generation because first-generation adult moths tend to lay their eggs for the second generation into first-generation larval damage. This insect is most numerous in southern Illinois and is found in northern Illinois primarily on trees growing near buildings. Mimosa webworm larvae migrate to overwinter, and they survive in colder climates under the siding of heated buildings.

Japanese beetle adults should emerge during the next week in southern Illinois, with emergence occurring during the last week of June in central and northern Illinois. Linden, crabapple, rose, and other favored hosts can be protected with sprays of carbaryl (Sevin), clothiandin (Arena), cyfluthrin (Tempo), or dinotefuran (Safari). Early control is important, as the beetles migrate to new hosts every 3 days. They will tend to migrate to hosts that already have Japanese beetle feeding damage. Handpicking of the beetles is also effective but time-consuming.

Emerald ash borer has been found in Naperville, Illinois. This represents the first find in Will County. It is within the previously quarantined northeastern Illinois area. *(Phil Nixon)*

Rose Slugs

Rose slugs are numerous this year throughout Illinois, causing rose foliage to be lacelike. The green larvae are more numerous on the undersides of the leaflets. Although causing window-feeding when young, the larvae are now large enough to eat holes in the leaflets and even cause defoliation.

The **bristly rose slug** is green, with fine, hairlike spines, and grows to about 1/2 inch long. **Rose slug** looks like bird manure when young but when older looks like the bristly rose slug without the bristles. Both are present at this time of year. Our reports indicate that the bristly rose slug is the most common this year.

Realize that although these insects look superficially like caterpillars they are sawfly larvae, and *Bacillus thuringiensis* kurstaki will not be effective against them. Acephate (Orthene), bifenthrin (Talstar), carbaryl (Sevin), and cyfluthrin (Tempo) are effective. Insecticidal soap will also be effective with very good coverage. Avoid getting the insecticide on flowers, although most rose varieties have had the nectar and pollen bred out of them and are not attractive to pollinating insects. Species roses and particularly some single-flowered varieties will attract pollinators, which could be killed by insecticide sprays on the blooms. Because carbaryl is more likely to cause bee kills, avoid spraying blooming roses being visited by pollinators with Sevin. *(Phil Nixon and Morton Arboretum)*

Bagworm

Bagworm, *Thyridopteryx ephemeraeformis,* hatches around the middle of June in Illinois, but control is most effective if delayed into early July.

Bagworms are commonly misidentified by the public. Eastern tent caterpillar, fall webworm, and even plastic grocery bags caught in trees may be identified by clientele as bagworms. Bagworms form silk, spindle-shaped bags up to 1-1/2 inches long. There is only one caterpillar per bag, and it covers the bag with foliage from the host plant.

Bagworm overwinters as eggs in the female bag. They hatch in late spring, exiting the bottom of the bag. The tiny caterpillars climb to the top of the tree where they each spin out a silk strand 1 to 3 feet long. This catches in the wind and carries the tiny larva wherever the wind blows. This is called ballooning. The larva then crawls to the top of whatever the silk caught onto and may repeat the process until it lands on a suitable host. The bagworm population continues this process for about 2 weeks. With this form of migration, it is no surprise that bagworms feed on a wide range of hosts. Eventually, the larvae are faced with the choice of feeding on what they land on or starving to death. They are most common on eastern red cedar, spruce, other junipers, arborvitae, white pine, crabapple, and pin oak but are found on many other species of trees and shrubs. They are more common on deciduous hosts in southern Illinois than farther north.

Bagworm larvae feed on the edges of broadleaf foliage, sometimes to the midvein. Leaves of needles evergreens are eaten back to the base until nothing remains. Defoliated needled evergreen branches or trees frequently die. Because bagworms start at the top of the tree and work their way downward, it is common to see the top third of evergreens defoliated and dead. Deciduous trees will refoliate, with the damage being primarily aesthetic.

Historically, this species has been rare north of Interstate 80 in Illinois; but bagworm has been common in northern Illinois for about the last 6 years. One would assume that a severe winter will eliminate populations north of I-80, but that is yet occur. Although last winter was considered to be severe by most people, from

an insect standpoint, it was relatively normal to mild. Temperatures did not go far below zero, and there were no extended periods of subzero weather. Snowfall was heavy, which helped insects overwintering in or on the ground to survive severely cold temperatures. The lack of midwinter thaws that humans missed were beneficial to the insects; they did not have to risk breaking dormancy.

Upon leaving its mother's bag, the newly hatched bagworm spins a silk tent and covers it with whatever is available, typically the host vegetation. The bagworms feed through the summer until pupating in late summer. Pupation ranges from mid-August to very early September. Male larvae go through five larval instars; female larvae go through six. For this reason, male bags tend to be smaller than those of the females, and they pupate sooner. As long as the caterpillar is feeding, it places bits of host foliage around the top of the bag. Once it has pupated or died, this practice stops and the top of the bags turn from green to brown. This is useful in scouting because pupated bagworms are not susceptible to insecticide sprays, and killed bagworms do not fall from the tree.

Adult male bagworms are about 1/2-inch-long black moths with clear wings. Adult female bagworms are larviform; that is, they emerge from the pupa looking similar to caterpillars. The nonfeeding males fly from bag to bag, mating with the females inside through the bottom of the bag. The nonfeeding females fill most of their bodies with eggs and die in the bag. Each female bag contains 300 to 1,000 eggs.

Because bagworm eggs overwinter in the old bags, an effective control measure on shrubs and smaller trees is to handpick the bags from September through May and destroy them. The eggs in bags dropped to the ground will hatch, and the larvae will climb the nearest upright object to balloon. Because the sex ratio in bagworms is about one-to-one, every other bag on average will contain 300 to 1,000 eggs. Handpicking feeding larval bags is effective, but it is less economical due to their higher number. Again, do not just drop the bags on the ground. Collect them and dispose of them far from trees and shrubs, or squeeze them to kill the larva inside before dropping them.

Bagworms are historically well-known for not being controlled by organophosphate, carbamate, and organochlorine insecticides during the second half of their larval lifespan. However, *Bacillus thuringiensis* kurstaki (Dipel, Thuricide), spinosad (Conserve), cyfluthrin (Tempo), permethrin (Astro), and other pyrethroids are effective even on older larvae. Even so, they are more effective on younger larvae, so treatment soon after they stop ballooning is recommended. In addition, controlling younger larvae prevents the damage that would be caused by the larvae through the season. *(Phil Nixon)*

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Major authors are Phil Nixon, (217)333-6650, and Fredric Miller, (708)352-0109, entomologists; Nancy Pataky, (217)333-0519, plant pathologist; and Tom Voigt and David Williams, (217)333-0350, and Michelle Weisbrook, (217)244-4397, horticulturists. Phil Nixon is the executive editor of the *Home, Yard, and Garden Pest Newsletter*. This newsletter is written by faculty in the Department of Natural Resources and Environmental Sciences and the Department of Crop Sciences. It is edited by Mary Overmier, Information Technology and Communication Services.

For subscription information, phone (217)333-2666 or (800)345-6087, or e-mail acesnews@uiuc.edu. Web subscriptions are available (http://www.ag.uiuc.edu/cespubs/hyg).

U of I Extension
Newsletter Service
University of Illinois
at Urbana-Champaign
1917 S. Wright
Champaign, IL 61820

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