Plant Health Care Report

The Morton Arboretum

Scouting Report of The Morton Arboretum

June 7 - 13, 2008 **Issue 2008.09**

Our report includes up-to-date disease and insect pest reports, as well as color images, for northeastern Illinois. You'll also find a table of accumulated growing degree days throughout Illinois, precipitation, and plant phenology indicators to help predict pest emergence.

An interesting note, a few weeks ago I reported on the first finding of the spittle bug. While out scouting this week and even working in my own garden, I have seen their "spit" everywhere and on everything. They are busy little bugs this year.

For all the dads out there, Happy Fathers Day!!

Quick View

What Indicator Plants are in Bloom at the Arboretum?

My favorite indicator plant, the Japanese tree lilac *(Syringa reticulata*) is blooming.

Accumulated Growing Degree Days (Base 50): 570.0

Insects

- Black vine weevil damage
- Bagworm
- Elm leafminer update
- Euonymus scale
- Four-lined plant bug
- Oak shothole leafminer
- Balsam twig aphid
- Lady bird beetle larva
- Oak bullet gall

Diseases

- Black spot on elm
- Peach leaf curl

Miscellaneous

- Chlorosis
- Oak leaf tatter

Degree Days and Weather Information

Through June 12, we are at 570.0 growing degree days which is 7 days behind of the historical average (1937-2006) and 14 days behind of last year.

Location	Growing Degree Days through June 12	Precipitation between June 7 to 12 in inches
The Morton Arboretum (Lisle, IL)	570.0	1.82
Chicago Botanic Garden (Glencoe, IL)*	460.5	1.75
Chicago O-Hare Airport*	501.0	4.41
Aurora, IL	601.5	
Bloomington, IL	702.0	
Champaign, IL	754.5	
DuPage County Airport (West Chicago, IL)	616.0	
Midway Airport	652.0	
Danville, IL	846.5	
Decatur, IL	809.0	
DeKalb, IL	605.0	
Moline, IL	698.5	
Palwaukee Airport (Wheeling, IL)	557.5	
Peoria, IL	785.0	
Peru, IL	815.0	
Pontiac, IL	715.0	
Rantoul, IL	838.5	
Rockford, IL	630.0	
Romeoville, IL	617.0	
Springfield, IL	825.5	
Waukegan, IL	446.5	
Madison, WI	480.5	
Milwaukee, WI	371.0	

**Thank you to Mike Brouillard, Green Living, Inc. and Chris Yooning, Chicago Botanic Garden for supplying us with this information.*

We obtain most of our degree day information from the Virtual Arborist web site. For additional locations and daily degree days, go to http://virtualarborist.com/.

This Week's Sightings

Black vine weevil damage

Black vine weevil (*Otiorhynchus sulcatus*) damage has been seen on the leaves of catawba rhododendron (*Rhododendron catawbiense*). Adult black vine weevils are nocturnal creatures that feed along leaf margins producing crescent-shaped notches. Moderate feeding is not damaging to plant health. The more serious damage is done by the larvae which consume tender feeder roots, causing foliage of infested plants to turn yellow or brown. When young roots become scarce or the soil becomes excessively moist, the larvae will move to larger roots at the base of the plant. Severe larval infestations can ultimately kill the host plant.

Adult female weevils emerge from the soil in late May through early July and feed for three to four weeks at night before laying eggs in the soil beneath the host plant. Eggs hatch in two to three weeks and the larvae feed on roots until late fall. With the onset of colder temperatures, larvae burrow deeper in the ground to overwinter. Black vine weevils feed on a wide range of herbaceous and woody ornamentals. Preferred hosts are yew, hemlock, and various rhododendrons.

Control: If you place boards down in infested areas, the weevils will hide under the boards during the day. You can them pick them up and destroy them. Insecticidal sprays are effective in controlling adult weevils. Insecticides should be applied now before egg laying occurs and repeated twice at 2-week intervals. Parasitic nematodes, *Steinernema feltiae* and *Heterorhabditis bacteriophora*, have been found to be effective in controlling larvae. They should be applied when larvae are present (in about five to seven weeks). Moderate to high soil moisture in July and August will help egg and larva survival. Remove excessive mulch layers to reduce soil moisture levels and do not water plants unless necessary. Excessively damp soils in the fall also force larvae to move up the base of the plant where girdling can occur. For specific chemical recommendations, refer to the *Commercial Landscape and Turfgrass Pest Management Handbook* (CPM) for commercial applicators or the *Home Yard and Garden Pest Guide* (HYG) for homeowners.

Good web sites:
http://ohioline.ag.ohio-state.edu/hyg-fact/2000/2016.html
http://www.uwex.edu/ces/wihort/gardenfacts/X1065.pdf

Bagworm

It has been reported that the first hatch of bagworm eggs (*Thyridopteryx ephemeraeformis*) has been spotted on honeylocust trees *(Gleditsia triacanthos*) at Joliet Junior College. Bagworms overwinter as eggs inside the female bag that contains between 300 and 1,000 eggs. The eggs hatch in early summer and the young larvae suspend from a silk string and are often "ballooned" by wind to nearby plants. When a suitable host plant is found, larvae begin to form bags over their bodies. By mid-August the larvae have matured and are 1 to 1-1/2 inches in length and their completed bags are 1-1/2 to 2-1/2 inches long. They move to a sturdy branch, attach the bag with a strong band of silk, and then pupate. About four weeks later, adults emerge and mate. The sedentary female, which has no eyes, wings, legs, antennae, or

functional mouthparts, lays eggs and is then mummified around the egg mass within the bag.

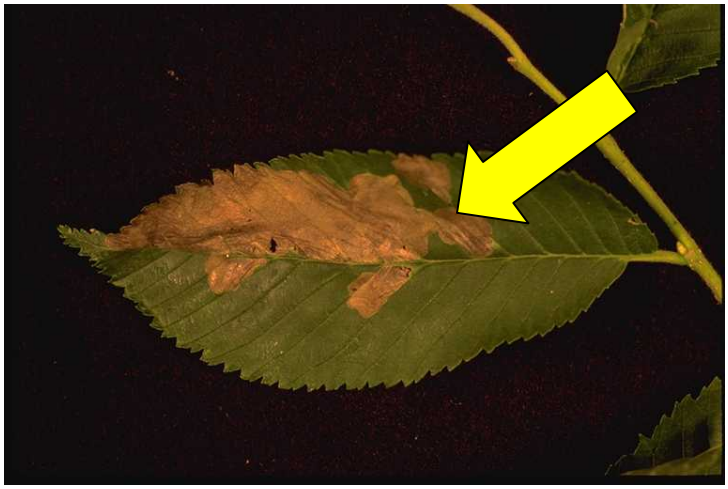
The tiny cone-shaped brownish bags are constructed from silk and camouflaged with bits of twigs and foliage. Larvae stick their heads and front legs out of the top of the bags to feed and move. Feeding by young larvae results in brown spots and holes in the foliage. As the larvae grow, they enlarge their bags and feed on the entire leaf leaving only veins. Bagworm populations can build rapidly and quickly defoliate their hosts. Healthy deciduous trees can usually tolerate three consecutive years of severe defoliation before they are killed. Evergreen trees, on the other hand, are frequently killed by just one severe defoliation. Bagworm larvae feed on over 120 species of trees and shrubs. Their bags are made of the foliage they're feeding on, so a bagworm feeding on pine will have pine needles in its bag, while a bagworm feeding on a crabapple will have pieces of crabapple leaves decorating its bag.

Until a few years ago, bagworms were generally considered more of a problem farther south, that is south of Interstate 80. However, they spread to this area on nursery stock. They have survived in this area in the last few years due to the warmer winter temperatures. Once a plant is infested, populations can grow quickly on that plant.

Control: Bagworms can be a serious problem. *Bacillus thuringiensis var. 'Kurstaki'* (BT) and insecticidal sprays are effective but need to be used on young larvae. It is best to wait until they have stopped ballooning before applying insecticide. Handpicking bags in winter and early spring will also help control populations. For further information about chemical control, refer to the CPM or HYG.

Good web sites:
http://www.ag.ohio-state.edu/~ohioline/hyg-fact/2000/2149.html
http://www.uky.edu/Agriculture/Entomology/entfacts/trees/ef440.htm

Elm leafminer update



First instar elm leaf miner larvae are starting to form mines on accolade elm (*Ulmus* 'Morton'). The mines look like pale spots about 1/8 inch in diameter near the mid-veins when we first saw them, but they were much larger now. The sawfly larvae are feeding on the leaf tissue between the upper and lower epidermis of the leaves. See PHC report May 10 – 16 (no. 2008.05) for more information, including how to test for leafminers.

Euonymus scale

Euonymus scale (*Unaspis euonymi*) is one of the most common insects that we see in the Plant Clinic, especially on ground cover euonymus. We are seeing scale and crawlers on the purple-leaved wintercreeper (*Euonymus fortunei* 'Coloratus'). The crawler stage is vulnerable to insecticides. Scale insects have piercing/sucking mouthparts (like a soda straw). Feeding by euonymus scale causes small yellow or white spots on the upper leaf surfaces. Moderately to heavily infested plants grow very slowly, if at all. Heavy infestations can cause branch dieback and may even kill some plants. Euonymus (*Euonymus* spp.), pachysandra (*Pachysandra* spp.), and bittersweet (*Celastrus* spp.) are the principle hosts. Stressed plants are most susceptible to attack. Plants growing adjacent to foundations with poor air circulation are more severely damaged. We don't see this insect on burning-bush euonymus (*Euonymus alatus*).

Male adult scales are white, while the females are dark brown and oystershell-shaped. Euonymus scales are armored scales, meaning they have a protective covering over their bodies. The crawlers are tiny and yellow; you definitely need a magnifier or hand lens to see them. Euonymus scales can be found on leaves as well as stems. Euonymus scale overwinters as mated females on plant stems. Eggs develop beneath the scale and hatch during late spring. The tiny yellow crawlers move to new succulent leaves to feed. This is the stage that we are seeing now. As they mature, they secrete a waxy protective coating or "armor." There are usually two generations per year in our area. We'll expect to see the second generation in late July and early August.

Control: Pruning out heavily infested branches can help to reduce the number of scales. Insecticidal soaps, summer oils, or insecticides should be applied now to control crawlers. Additional applications are typically recommended. For information about chemicals to use for serious infections, refer to the CPM if you are a commercial landscaper or the HYG if you are a homeowner.

Good web sites:
http://www.entomology.umn.edu/cues/Web/124EuonymusScale.pdf
http://bugs.osu.edu/~bugdoc/Shetlar/factsheet/ornamental/FSscaleuonymus.htm

Four-lined plant bug

Four-lined plant bugs (*Poecilocapsus lineatus*) have been found on many different kinds of plants including Japanese anemone (*Anemone hupehensis*) and Japanese kerria *(Kerria japonica*). This insect feeds on 250 species, including many kinds of perennials, vegetables, and shrubs such as bluebeard, forsythia, and sumac. Feeding injury is frequently mistaken for leaf spots. Four-lined plant bugs have a piercing, sucking mouthpart which they use to break plant cells and then flush the feeding wound with digestive juices. Sounds painful! Damage appears as dark leaf spots which subsequently turn translucent. The damage they do is more serious on herbaceous plants than on woodies. Sometimes by the time the damage is noticed, the insect isn't there anymore. Both nymphs and adults feed on leaves, creating the spots.

Nymphs are bright yellow to red with rows of black spots on the abdomen. The adult stage is 1/4" to 1/3" long and has four longitudinal black lines on its yellow or green back, thus the name. It's quite a shy insect that scurries away when you try to find it. The insect overwinters as eggs laid in slits that are cut into plant shoots. There is one generation per year.

Control: Some people try to hand-pick these insects, but their timidity makes them difficult to catch. For information about chemicals to use for serious infestations, refer to the CPM if you are a commercial landscaper or the HYG if you are a homeowner. Refer to "plant bugs."

Damage from four-lined plant bug.

Good web sites:

http://www.extension.umn.edu/yardandgarden/ygbriefs/e121plantbugs-fourlined.html
http://wihort.uwex.edu/gardenfacts/XHT1101.pdf

Oak shothole leafminer

We're seeing "shotholes" (1/10th to 1/5th of an inch holes that appear in a shot gun pattern) in the leaves of bur oak (*Quercus macrocarpa*). The shotholes are caused from feeding by the oak shothole leafminer (*Agromyza viridula*).

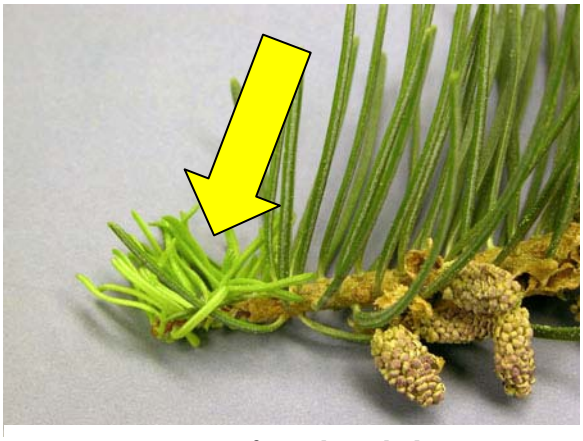
Adult females feed on emerging leaves by inserting their ovipositor into leaves, jabbing it around to liquefy the tissue, then lapping up the fluids. Eggs are laid inside a feeding site and emergent larvae mine into the leaf. The injured tissue browns, dries into a disk, and drops out of the leaf.

Shothole injury can be mistaken for leaf tatter damage. Leaf tatter occurs during hard frosts when leaves are still in bud. Frost, combined with heavy winds during leaf emergence, causes somewhat uniformly distributed jagged, open spaces between the main veins of the leaves. Shotholes are more randomly distributed and more clearly defined.

Control: Damage is usually an aesthetic problem and control is not recommended.

Good web site:
http://bugs.osu.edu/~bugdoc/Shetlar/factsheet/ornamental/FSoakshotholelm.htm

Balsam twig aphid



Damage from the aphids.

We are finding balsam twig aphid adults (*Mindarus abietinus*) on balsam fir (*Abies concolor*). They are about 1/12th of an inch long, pale blue, and are beginning to cover themselves with white waxy wool. Due to the presence of the wool, the balsam twig aphids can be mistaken for balsam woolly adelgids. The aphids, however, are needle feeders (under the microscope you can actually see their mouth part pierced into the needle – very cool!) whereas the adelgids feed on stems, branches, and twigs. Also, adult adelgids are purplish-black while the adult aphids are pale blue to pale green. Usually the colors of both are masked beneath their white waxy wool.

The aphids overwinter as eggs in bark crevices of the host plant. In early spring, a few weeks before balsam fir bud break, small blue-green nymphs emerge and feed primarily on the old growth, causing little damage. In late spring, the second and third generations feed on new needles, causing curling and permanent deformity of new shoots. Copious amounts of honeydew are also present.

Balsam twig aphids also infest Fraser fir, Siberian fir, subalpine fir, white spruce, Colorado blue spruce, and juniper.

Control: Damage to trees is primarily aesthetic so control is not recommended.

Lady bird beetle larva

I have seen the larvae all over our fir trees. No coincidences here since one of their favorite foods - aphids, are on the fir trees. I also have been lucky enough to watch them change into the ladybug we all know and love. Lady bird beetles, more commonly but incorrectly known as ladybugs, are an important beneficial insect. Both adults and larvae are predators of many different soft-bodied insects including aphids, spider mites, and mealybugs. A single larva will eat as many as 1,000 aphids during its development and an adult will eat up to 5,000 aphids during its lifetime. When ladybird beetles are present, insecticides should be used sparingly or use less toxic horticultural oils and insecticidal soaps.

There are over 400 species of lady bird beetles in North America. One species, the orange-colored multicolored Asian lady bird beetle, *Harmonia axyride*, has become an irritating household pest.

Known as 'halloween ladybugs', they abound in the fall and are attracted, often en masse, to the warm surfaces of light-colored buildings. They finagle their way inside and take up residence for the winter. These ladies are worth their weight in gold in terms of controlling agronomic crop pests, but they have largely out competed our native ladybird beetles.

Oak bullet gall

The oak bullet gall has been found on twigs and branches of bur oak (*Quercus macrocarpa*). This gall is made by a tiny wasp called a cynipid (*Disholcaspis quercusmamma)*. The wasp is 1/12th to 1/8th of an inch long, winged and is brown or black in color. They are rarely seen.

In the spring, the tiny adult female wasps chew out of last year's galls. The female wasps deposit their eggs on the midrib of oak leaves. When these eggs hatch, the larvae feed on leaf tissue, causing small blister-like galls to appear on the mid veins of the leaves. These larvae mature inside these galls, mate, and deposit their eggs on branches and twigs of their oak tree host. When these white, legless larvae feed, they inject plant growth regulating chemicals, which react with the tissue in the tree to produce the abnormal plant tissue that comprises these galls. The gall provides the larvae with a nutritious source of food and protects them from parasites, predators and insecticides. Like all galls, the only damage, is cosmetic.

Control: Control for these wasps is not effective.

Good web site:
http://www.extension.iastate.edu/newsrel/2004/may04/may0414.html

Black spot on elm

Black spot, caused by the fungus (*Stegophora ulmea*), has been found on the leaves of Moline American elm (*Ulmus americana* 'Moline'). This disease first appears as small black leaf spots. Later, spots may coalesce to form irregular black blotches up to ¼ inch wide. Wet seasons, which we are having, may cause severe blighting of young leaves and succulent shoots or complete defoliation by early August. Symptoms normally progress from low branches to high ones. Susceptible elms include American, Chinese, Dutch, Japanese, Scotch, and Siberian.

Control: This disease is one of several "anthracnose" diseases we see each year. Dead leaves and shoots should be collected and pruned out during dry weather to reduce inoculum. Chemical controls are available but are not usually necessary. Refer to the CPM or HYG for specific chemical recommendations.

Good web site:
http://www.ento.okstate.edu/ddd/diseases/elmblackspot.htm

Peach leaf curl

Peach leaf curl (*Taphrina deformans*) was diagnosed at the plant clinic this week. This fungal disease is most severe when cool, wet weather is prevalent when the leaves are first emerging. Young, succulent leaves become puckered and deformed as they develop. The puckers almost look like popcorn! The puckered areas turn yellow and then red. A white bloom appears on the deformed part of the leaf. Shortly after, the leaves turn yellow and fall off. Diseased twigs become swollen and stunted. Diseased fruits also become distorted and swollen with discolored areas on the skin. Peach leaf curl generally does not kill the tree, but annual infections may weaken a tree and predispose it to other problems.

Control: The fungus overwinters in buds. Fungicides are only effective when applied in fall after leaf drop or in spring before buds swell. Once the leaves have emerged, fungicides are no longer effective. For specific chemical recommendations, refer to the CPM and HYG.

Good web sites:
http://www.ag.ohio-state.edu/~ohioline/hyg-fact/3000/3006.html
http://www.agcom.purdue.edu/AgCom/Pubs/BP/BP-54.pdf

Miscellaneous

Chlorosis

We are starting to see chlorosis on white oak (*Quercus alba*). Chlorosis is a yellowing of the leaf due to low levels of chlorophyll. In mild cases, leaf tissue appears pale green but the veins remain green. Leaf tissue becomes progressively yellow, and may turn white in advanced cases. Leaf margins may become scorched or develop symmetrical brown spots between veins. Trees that commonly show chlorosis include pin oak, red oak, red maple, white oak, river birch, tulip-tree, sweet gum, bald cypress, magnolia, and white pine.

There are many causes of chlorosis including compacted soils, poor drainage, root damage, alkaline soils, and macro- and micro-nutrient imbalances. The most common chlorosis in our area is due to iron and manganese deficiencies resulting from alkaline soils. High pH causes iron and manganese that is present to become unavailable.

Control: The best control is to avoid planting trees that do not tolerate alkaline soils. If leaves do become chlorotic, first determine the pH of the soil by doing a soil test or sending a sample of soil to a laboratory. Some regional university Cooperative Extension Service offices can determine basic soil properties such as soil pH. Regional laboratories include:

- A & L Great Lakes Laboratories in Fort Wayne, Indiana (260-483-4759)
- Alvey Laboratories in Belleville, Illinois (618-233-0445)
- Kane County Farm Bureau in St. Charles, Illinois (630-584-8660)
- University of Wisconsin Cooperative Extension Service in Madison, Wisconsin (608-262-4364)

Take the necessary steps to remedy the situation based on the results of the test.

Both short and long term solutions are available. Short term solutions treat the symptoms, but not the underlying causes of chlorosis. These include:

- Fertilizing soil with a nitrogen- and sulfur-based fertilizer in early spring through mid-May.
- Spraying micronutrients such as iron chelate or iron sulfate on leaves.
- Injecting trunks with iron or manganese-containing compounds (this should be done by a certified arborist).

Long term solutions include:

- Acidifying the soil by removing grass from under the tree and applying a one to two inch layer of organic compost such as acidic leaf mold with a three to four inch deep layer of organic mulch on top of the compost (such as composted woodchips).
- Granular sulfur or ammonium sulfate (three pounds per 100 square feet) should be applied to the soil beneath the crown of the tree out to the drip line in early spring. If possible, apply 1.5 pounds per 100 square feet beyond the drip line. Water thoroughly after application since sulfur can cause a chemical burn to grass.
- Alternately, in fall, applying granular sulfur at a rate of three pounds per 100 square feet beneath the crown of the trees out to the drip line. This should be watered in or applied immediately before a rainfall.
- Avoid fertilizers that contain nitrates, limestone or material that contain lime and will raise the pH.
- Avoid fertilizing chlorotic plants with potassium and phosphorus unless a soil test indicates a deficiency.
- Watering during dry periods.

Be sure to following the label directions when applying any fertilizer.

Good web sites:
http://www.ag.uiuc.edu/~vista/abstracts/aIRONCHL.HTML

Oak leaf tatter

A sample of oak leaf tatter was brought into the plant clinic on a white oak. Oak leaf tatter is not caused by an insect or a disease. Oak leaf tatters have been also reported in Iowa, Indiana, Ohio, Michigan, Wisconsin, Minnesota, and Missouri. It can affect all sizes and ages of primarily the white oak family. Damage appears at the time of leaf emergence in the spring. Newly emerged leaves of affected trees have a lacy or tattered appearance.

Trees will produce a new flush of replacement leaves, but this reduces important stored energy reserves. Healthy trees can overcome this stress, but repeated damage or damage in combination with other stress events (such as drought, insects and diseases) may make trees more susceptible to decline.

Oak tatters can be confused with anthracnose, a disease which also damages oak leaves in spring but causes brown lesions on the foliage. Feeding by caterpillars and other insects can cause the leaves to have a lacy appearance, look for frass (poop) or webbing. Other suspected causes include, environmental stress, cold damage, and herbicide drift.

In 2004, three researchers Jayesh Samtani, John Masiunas, and Jim Appleby, at the University of Illinois performed a preliminary study that indicated that drift of chloroacetamide herbicides (possibly from applications onto corn and soybean fields) was a possible factor in leaf tatters.

Good websites:
http://fhm.fs.fed.us/posters/posters04/white_oak1.pdf
http://www.extension.uiuc.edu/mg/oaktatters.htm

What to Look for Next Week

Next week we will be looking for spiny elm caterpillars and maple anthracnose.

Quote of the week: “The greatest gift of the garden is the restoration of the five senses.” ~Hanna Rion

The Plant Health Care Report is prepared by Trica Barron, Plant Health Care Technician, and edited by Donna Danielson, Plant Clinic Assistant; Fredric Miller, PhD, research entomologist at The Morton Arboretum and professor at Joliet Junior College; Doris Taylor, Plant Information Specialist, and by Carol Belshaw, Plant Clinic volunteer. The information presented is believed to be accurate, but the authors provide no guarantee and will not be held liable for consequences of actions taken based on the information.

The *2007 Commercial Landscape & Turfgrass Pest Management Handbook* (CPM), for commercial applicators, and the *Home, Yard & Garden Pest Guide* (HYG) for homeowners from the University of Illinois, are available by calling (800-345-6087). You may also purchase them online at https://pubsplus.uiuc.edu/ICLT-07.html (commercial handbook) and https://pubsplus.uiuc.edu/C1391.html (homeowners’ guide). One further source is your local county extension office.

This report is available on-line at The Morton Arboretum website at http://www.mortonarboretumphc.org/.

For pest and disease questions, please contact the Plant Clinic at (630) 719-2424 between 10:00 and 4:00 Mondays through Saturdays or email **plantclinic@mortonarb.org.** Inquiries or comments about the PHC reports should be directed to Trica Barron at tbarron@mortonarb.org.