Plant Health Care Report

The Morton Arboretum

Scouting Report of The Morton Arboretum

June 10, 2011 Issue 2011.08

Our report includes up-to-date disease and insect pest and abiotic problem information 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. The Report is published bi-weekly on Friday in April and August, and weekly May-July.

Arboretum employees and volunteers will be scouting our grounds for insects and diseases throughout the season. Information about other pest and disease problems based on samples brought into the Arboretum's Plant Clinic from homeowners and professionals will also be included.

Over the course of the next year the Plant Health Care Report (PHCR) will be undergoing some format changes, but will still be offering the same content. If you prefer a PDF version of the PHCR, please click here to download and print.

Accumulated Growing Degree Days ($Base_{50}$): 546
Accumulated Growing Degree Days ($Base_{30}$): 1975
This week's Indicator Plant: Japanese tree lilac (*Syringa reticulata*)

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Weather update

As of June 9, 2011, we are at 527.5 base-50 growing degree days (GDD_{50}), which is 155.5 GDD_{50} (10 calendar days) behind 2010, and behind the historical average (1937-2010) by 104 GDD_{50} (6 calendar days). June has received 3" precipitation, which brings us to 18.4" of precipitation for the year. As of the end of May we were 1.6" behind the cumulative average precipitation from 1937-2010.

	B_{50} Growing Degree Days through June 10	**Precipitation (inches) June 3-9**
Aurora, IL*	596	
Carbondale, IL*	1261	
Chicago Botanic Gardens**	447	0.41
Chicago Midway*	535	
Chicago O'hare**	508	0.21 (June 1-7)
Crystal Lake, IL*	575	
Harvard, IL*	542	
Kankakee, IL*	735	
The Morton Arboretum	465	2.93 (June 3-10)
Peoria, IL*	874	
Quincy, IL*	965	
Rockford, IL*	608	
Springfield, IL*	991	
Waukegan, IL*	443	
Champaign, IL*	878	

**Thank you to Mike Brouillard, Northbrook Park District, and Chris Henning, Chicago Botanic Garden, for supplying us with this information.

*We obtain most of our degree day information from the GDD Tracker from Michigan State University web site. For additional locations and daily degree days, go to http://www.gddtracker.net/?zip=60185&model=2&state=IL

Pest Update: Insects

Honeylocust plant bug

Honeylocust plant bug nymphs have been feeding on newly-emerging honeylocust leaves (*Gleditsia triacanthos*). The easiest way to find these and other plant bugs is to shake a branch over a white piece of paper. When you see a tiny green insect crawling on the paper, look at it through your hand lens. Honeylocust plant bugs have a pair of four-segmented antennae, although the antennae are probably too small at this stage to see without a microscope. Older nymphs also have yellow spots on their backs. This plant bug overwinters as an egg under the bark of two- and three-year-old twigs. The eggs hatch soon after bud break and the nymphs crawl to unfolding leaves to feed. The insects are very small and in May to early June (now), the plant bugs become adults. Both nymphs and adults feed on foliage until early summer and can cause severe leaf distortion, dwarfed leaflets, chlorosis, and yellow-brown leaf spots. A heavy plant bug infestation may cause a failure to leaf out or premature leaf drop. In the past, our heavily infested trees were able to leaf out again.

Management: Young nymphs can be knocked off leaves of small trees by spraying them with a strong stream of water. In severe infestations, insecticidal soaps, summer oils, and insecticides may be warranted. For chemical recommendations, refer to the *Commercial Landscape and Turfgrass Pest Management Handbook 2010* (CPM) for commercial applicators, or the *Home, Yard and Garden Pest Guide* (HYG) for homeowners. Resistant cultivars can be planted such as 'Skyline' and 'Shademaster'. In general, yellow-leaved cultivars are more susceptible to this pest.

Suggested reading:http://woodypests.cas.psu.edu/FactSheets/InsectFactSheets/html/Honeylocust.html

Spruce needleminer

Overwintering spruce needleminer (*Endothenia albolineana*) larvae are active and are feeding on spruce (*Picea* sp.). Infested needles have turned yellow and have round entry holes at their bases.

Larvae overwinter in nests formed from silk, dead mined needles and frass. In early spring, they emerge and begin mining needles until pupation in mid-May. Adult moths emerge in June, and the females lay pale green eggs at the base of needles. Typically in July,

larvae hatch and begin mining and hollowing out needles; this feeding continues until frost. Each larva is capable of eating the insides of up to ten needles. Needleminers usually attack Norway, white, and Colorado spruces growing under adverse conditions in the upper Midwest. Infestations and damage are usually minor.

Management: To reduce the current year's infestation, wash away the nests with a forceful stream of water now. Gather and discard the resulting debris.

Imported currant worm

Imported currant worm (*Nematis ribesii*) larvae are feeding on alpine currant (*Ribes alpinum*). The young larvae eat holes in leaves and feed in colonies. Young larvae are yellow with black spots and have dark heads. As they mature, they lose their spots and become a uniform green in color with yellowish heads (no longer black). They have eight pairs of prolegs so they're sawflies, not caterpillars (remember caterpillars have five pairs of prolegs or fewer). For more information about the differences between caterpillars and sawfly larvae, see PHC Report 2007.03. As they mature, larvae become more voracious eaters, completely stripping plants of foliage. The full-grown larva is approximately 8 mm (0.33 in) long, greenish yellow with a black head, and covered with black spots.

Management: Use the pick and squish method in small infestations. In more severe infestations, insecticides control larvae and should be applied now. *Bacillus thuringiensis* var. *kurstaki* (Btk) is not effective since the currant worms are sawflies, not caterpillars. Refer to the CPM if you are a commercial applicator or the HYG if you are a homeowner.

Suggested reading: http://lawnandgarden.unl.edu/scripts/com_disease_insect.cgi?ID=485

Ash-lilac borer

Ash-lilac borers (*Podosesia syringae*) have recently been caught in our pheromone traps at The Arboretum. This is NOT the emerald ash borer, but is the native borer. The adults are wasp-like clear-wing moths with a 1.3 cm (0.5 in) long brown body, brownish-black forewings, and transparent hind wings with a brown border. Sometimes they have one or more yellow stripes around their bodies. The insect overwinters as a partially grown larva within the host tree and emerges as an adult in late spring. The female lays her eggs in the bark of stressed plants in the Oleaceae family, especially lilac, ash, and privet. After hatching, brown-headed, creamy white larvae tunnel into wood and feed on phloem. Exit holes are about 0.64 cm (0.25 in) in diameter and circular. Frass and sawdust is pushed out of the exit holes and may accumulate under the exit holes. Sometimes pupal skins can be seen emerging from exit holes. Branches can be severely damaged by this borer, and severely infested trees may die.

Management: Stressed and newly transplanted trees are particularly vulnerable. Site trees and shrubs in a place where they will thrive, and keep trees mulched and watered during dry periods. Prune out heavily infested stems. Since the borers are attracted to the larger lilac canes, keep lilacs rejuvenated by making basal cuts and letting new trunks grow. Insecticide sprays of permethrin may be applied to the trunks and branches of lilacs when bridal wreath spirea are in full to late bloom to prevent borer damage. For more chemical recommendation information, refer to the CPM from the University of Illinois if you are a commercial applicator in Illinois or HYG if you are a homeowner.

Suggested reading: http://www.ipm.uiuc.edu/fruits/insects/ash_lilac_borer/
http://www.ext.vt.edu/pubs/entomology/444-278/444-278.html

Holly leafminer

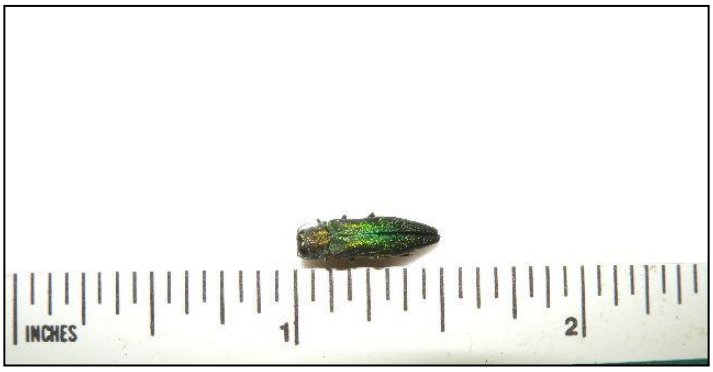
There are approximately twenty native holly leafminer species in the United States. The most common to mine American holly is *Phytomyza ilicicola* and English holly is *P. ilicis*. Regardless of the species there is only one generation per year. They overwinter as larvae or pupae in the infested leaves. The 3.2 mm (0.125 in) long adults emerge in early to mid-May, and soon after they mate and the female lays eggs. Further damage, aside from the mines, is a result of male and female feeding and

from the female's oviposition during egg laying into the leaves. Once the eggs hatch in early summer, they create mines that are small and narrow. In the autumn the mines get much larger and more noticeable. Leaves with few or small mines may remain on the plant until the natural leaf-shedding. Severely affected leaves will abscise from the plants in the autumn

Management: Hollies growing in full-sun are more susceptible to infestation by holly leaf miners, so plant them in part shade. Remove any infested leaves that are either on the plant or ground, and remove them from the property. Chemical controls include multiple foliar sprays with acephate or spinosad, or soil drenches with imidacloprid. For more information on chemical recommendations, refer to the CPM.

Suggested reading: http://ipm.illinois.edu/greenhouse/insects/leafminers/index.html
http://woodypests.cas.psu.edu/factsheets/insectfactsheets/html/Native_Holly_Leafminer.html

Emerald ash borer



Emerald ash borer (EAB) (*Agrilus planipennis* Fairmair) has been reported emerging in the Chicago-land area. It has been estimated that the adults emerge at 450 DD_{50} or when black locust are blooming. EAB is an exotic beetle that was discovered in southeastern Michigan near Detroit in the summer of 2002. The larvae feed on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients, causing the destructive damage. Adults leave a D-shaped exit hole in the bark when they emerge in May - August. The adult beetles are metallic green and about 1.27 cm (0.5 in) long. They nibble on ash foliage but cause little damage.

Symptoms of ash decline, which may be caused by EAB or other stressors, include upper crown dieback, yellow foliage, or small branches that come directly out of the trunk. Woodpeckers like EAB larvae; so heavy woodpecker damage on ash trees may be a sign of infestation.
Besides Michigan, the emerald ash borer is also established in Windsor, Ontario, and was found in Ohio (2003), Indiana (2004), Illinois and Maryland (2006), Pennsylvania and West Virginia (2007), Wisconsin and Missouri (2008), Minnesota, Tennessee, New York, Virginia, Kentucky (2009), and Iowa (2010).

Here in Illinois the state quarantine boundaries include the entire counties of Boone, Champaign, Cook, DeKalb, DuPage, Ford, Grundy, Iroquois, Kane, Kankakee, Kendall, Lake, LaSalle, Lee, Livingston, McHenry, McLean, Ogle, Putnam, Vermillion, Will, Winnebago, and Woodford.

Further quarantine information taken from the IL Deptartment of Agriculture website:

"The eastern portion of Bureau County described as follows:
A. bounded on the north by the northern Bureau County line from Illinois Route 40 to the eastern Bureau County line;
B. bounded on the east by the eastern Bureau County line;
C. bounded on the south by the southern Bureau County line from the eastern Bureau County line to Illinois Route 40; and

D. bounded on the west by Illinois Route 40;

The eastern portion of Marshall County described as follows:
A. bounded on the north by the northern Marshall County line from the Illinois River to the eastern Marshall County line;
B. bounded on the east by the eastern Marshall County line;
C. bounded on the south by the southern Marshall County line from the eastern Marshall County line to the Illinois River; and
D. bounded on the west by the Illinois River; and

Any other area within the State of Illinois where the presence of the Emerald Ash Borer (*Agrilus planipennis* Fairmaire) is confirmed in the future."

State and federal quarantines have been established to limit the artificial (or human-assisted) spread of the pest. The federal quarantine of the entire state of Illinois restricts the movement of all EAB-host material (ash nursery stock, ash wood and all non-coniferous firewood) across the state borders to other states.

Dr. Fredric Miller's lab has put up EAB traps around the Chicago-area for ongoing research and survey projects. Dr. Miller is a Research Associate Entomologist at The Morton Arboretum and Professor at Joliet Junior College. More on his lab's findings will be reported later in the season.

Management: Currently the only control is prevention of the infestation for all ash trees. Chemicals may be applied to prevent infestation. Please contact a local arborist for more information on these chemical applications.
For detailed information on the chemicals available for EAB control, download Insecticide Options for Protecting Ash Trees From Emerald Ash Borer, which is the comprehensive work of several collaborating researchers.

Arboretum articles on EAB:
http://www.mortonarb.org/tree-plant-advice/article/600.html
http://www.mortonarb.org/tree-plant-advice/article/593/eab-advice-to-homeowners.html
http://www.mortonarb.org/tree-plant-advice/article/594/latest-eab-information-for-municipal-foresters.html

Suggested reading:
http://www.emeraldashborer.info
http://www.na.fs.fed.us/fhp/eab/ Emerald Ash Borer Now in Ten States
http://www.agr.state.il.us/eab
http://www.aphis.usda.gov/ppq/ep/eab/

Pest Update: Diseases

Ash anthracnose

We are seeing the initial symptoms of ash anthracnose on green ash (*Fraxinus pennsylvanica*). Anthracnose is a foliar disease affecting many deciduous trees including ash, sycamore, elm, oak, and maple. The disease is caused by several different fungi, including *Apiognomonia errabunda, A. veneta, Discula fraxinea*, *Glomerella* sp., *Gnomonia* sp., and *Stegophora ulmea*, depending on host species.

Symptoms vary with the plant host, weather, and time of year when infection occurs. Infection is more severe when prolonged spring rains occur after new growth is produced. In the case of ash anthracnose, initial symptoms are small irregular, dark brown, necrotic patches, often accompanied by leaf curl and distortion. Premature leaf drop may occur on highly susceptible species. Damage is usually minor on ash in our region and symptoms dissipate as rains diminish and temperatures increase in early summer.

Management: Cultural methods are usually sufficient to reduce the severity of ash anthracnose in our region, these include:

• Prune trees to remove diseased twigs and branches and to open up the canopy for better air circulation and light penetration.
• Maintain tree vigor with proper watering and fertilization.
• Mulch around the base of the tree (always keep mulch about 5-10 cm (2 to 4 in) from the trunk).
• In the fall, clean up and destroy fallen leaves to reduce the source of inoculum.
• Select species that are resistant to anthracnose. Ash anthracnose is worse on green ash (*F. pennsylvanica*) cultivars than white ash (*F. americana*) and the Asian F. chinensis appears to be most susceptible. Our native pumpkin ash (*F. tomentosa*) and blue ash (*F. quadrangulata*) appear to be most resistant but none are immune. To read further on this topic, see the Journal of Arboriculture, Vol. 28, No. 1 or visit: http://joa.isa-arbor.com/request.asp?JournalID=1&ArticleID=24&Type=2.

Suggested reading:
http://www.ipm.iastate.edu/ipm/hortnews/2007/5-23/ash_anthracnose.html
http://www.extension.umn.edu/yardandgarden/ygbriefs/p413ashanthrac.html

Oak anthracnose

Oak anthracnose, caused by *Discula quercina*, has been found on bur oak (*Quercus macrocarpa*). Symptoms on trees in the

white oak subgenus follow one of three patterns: 1) Early infection in which young leaves turn brown and shrivel during leaf expansion (this is what we are seeing now); 2) A later infection in which large, irregular blotches develop and distort leaves. The lesions then dry, become papery, and may turn tan to white; and 3) Mature leaves are infected and develop small necrotic spots. All three patterns typically start at the bottom of the tree because of high moisture and rainfall flow.

Management: In most years, control of anthracnose on oaks is unnecessary because the disease does not affect the long-term health of oak trees. Collecting and destroying fallen leaves and twigs, and pruning dead twigs, will help reduce the overwintering population of the pathogen. Pruning during the dormant season will also increase air circulation and lower humidity within the canopy. Mulching and watering (not overhead) during dry periods will help keep trees healthy. Chemical sprays to control anthracnose are rarely justified except when the disease occurs in stressed or recently transplanted trees, or when the disease causes repeated defoliations. Refer to the CPM or HYG for information on chemical control.

Suggested reading: http://ohioline.osu.edu/hyg-fact/3000/3048.html
http://www.na.fs.fed.us/spfo/pubs/fidls/anthracnose_east/fidl-ae.htm

Pest Update: Abiotic problems

Chlorosis of pin oak

White oaks (*Quercus alba*) are starting to show signs of chlorosis. 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.

Management: 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 laboratories can determine basic soil properties such as soil pH. For information on labs that do soil testing, visit this website: http://www.mortonarb.org/calendar/article/662/chlorosis.html.

Once you get the lab results, 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).
• Applying 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.
• Avoiding fertilizers that contain nitrates, limestone, or materials that contain lime and will raise the pH.
• Avoiding 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.

Suggested reading: http://urbanext.illinois.edu/focus/chlorosis.cfm

Delayed frost damage

Frost damage has been found primarily on redbuds in the area surrounding The Arboretum. We suspect the damage occurred in late March. Succulent and emerging foliage, as well as flowers, are susceptible to frost injury, caused by ice crystals forming within plant cells and breaking cell walls. The injury on leaves is characterized by blackened leaves or leaf margins. If entire leaves were killed, dormant buds will become active and become new leaves as the season progresses. Although the injury can be disheartening at first, it will not affect the health of trees and shrubs.

If you are concerned about freeze injury to flower buds, cut a few in half longitudinally with a sharp knife. If the area in the center is white or cream color, no damage has been done. But if the center in several buds or blossoms is dark brown or black, the buds have been killed.

What to look for in the next week: Two-marked treehopper, black vine weevil, rose rust, dog vomit slime mold, downy leaf spot, four-lined plant bug

Thank you...I would like to thank the volunteers that scouted this past week and found most of the insects and diseases that are in this report. The Scouting Volunteers for this Report include: Mary Carter Beary, Davida Kalina, Fritz Porter, LeeAnn Cosper, Ann Klingele, and Loraine Miranda. Your hard work is appreciated.

The Plant Health Care Report is prepared by Stephanie Adams, M.S., Plant Health Care Technician, and edited by Donna Danielson, M.S., Plant Clinic Assistant; Fredric Miller, Ph.D., research entomologist at The Morton Arboretum and professor at Joliet Junior College; Doris Taylor, Plant Information Specialist, and Carol Belshaw, an Arboretum 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.

Literature recommendation:
Indicator plants are chosen because of work done by Donald A. Orton, which is published in the book *Coincide, The Orton System of Pest and Disease Management*. This book may be purchased through the publisher at: http://www.laborofloveconservatory.com/

The *2010 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).

This report is available on-line at The Morton Arboretum website at http://www.mortonarb.org/tree-plant-advice.html 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 Stephanie Adams at sadams@mortonarb.org .