Plant Health Care Report

The Morton Arboretum

Scouting Report of The Morton Arboretum

July 8, 2011 Issue 2011.12

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 this 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.

If you would like to receive a notification email when the PHC Report is available on-line, send me an email (sadams@mortonarb.org) with 'subscribe to PHCR notification' in the subject. The emails on the notification list are only used for the notification and nothing else.

Accumulated Growing Degree Days ($Base_{50}$): 1026
Accumulated Growing Degree Days ($Base_{30}$): 2955
This week's Indicator Plant: Bottlebrush buckeye (*Aesculus parviflora*)

Index
Weather update
Pest Update:
Insects
- Cypress twig galls
- Spiny witch-hazel aphid
- Cynipid galls on elm
- Pine tube moth

Diseases
- Tobacco mosaic virus on tomato
- Sooty mold

Abiotic
- Chlorosis
- Abiotic and bacterial leaf scorch

Weather update

As of July 1, 2011, we are at 1026 base-50 growing degree days (GDD_{50}), which is 359 GDD_{50} (16 calendar days) behind 2010, and behind the historical average (1937-2010) by 283 GDD_{50} (13 calendar days). July has received 0.14" of precipitation, which brings 2011 to 20.98" total.

	B_{50} Growing Degree Days through July 8	**Precipitation (inches)**
Aurora, IL*	1164	
Carbondale, IL*	2018	
Chicago Midway*	1086	
Chicago Botanic Gardens**	973 (7/6/11)	0.0 (6/29-7/6)
Chicago O'hare**	1063.5 (7/6/11)	0.0 (6/29-7/5)
Crystal Lake, IL*	1132	
Harvard, IL*	1075	
Kankakee, IL*	1346	
The Morton Arboretum	1026	0.14 (7/1-7/8)
Peoria, IL*	1516	
Quincy, IL*	1611	
Rockford, IL*	1177	
Springfield, IL*	1654	
Waukegan, IL*	941	
Champaign, IL*	1519	

**Thank you to Mike Brouillard, Northbrook Park District, and Chris Henning, Chicago Botanic Gardens, 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

Cypress twig galls

We are seeing cypress twig galls on bald-cypress (*Taxodium distichum*). Looking at the trees, we see what appears to be white cones hanging on the leaves. The cypress twig gall midge (*Taxodiomyia cupressiananassa*) causes the heavy, spongy galls to form on leaf bud tissue. When numerous, the galls may cause branches to droop under their weight. Galls are oval, light green to whitish in color, about 3/4 inch long, and located at the tips of new growth. Needles (leaves) grow out of the galls. We sliced one in half and found really tiny maggots inside.

The larvae overwinter in the gall and emerge as flies beginning in mid-May. Females lay eggs on newly

developing leaves, and the midge larvae induce the gall formation by the leaflets. At the end of the growing season, galls turn brown, and, in autumn, they drop to the ground with the leaves.

Management: Some people find the galls aesthetically unpleasing, but the galls do not affect tree health. Control may be obtained by raking and destroying fallen galls in autumn and pruning out galls in early spring before the midges become active and lay eggs. Damage is minimal.

Spiny witch-hazel gall aphid

Spiny witch-hazel gall aphids (*Hamamelistes spinosus*) are feeding on the underside of river birch (*Betula nigra*) leaves. Their feeding causes leaves to appear corrugated, gradually curl, turn brown, and drop prematurely.

The insect overwinters in two ways – either as an egg on witch-hazel twigs or as a hibernating female on birches. Eggs hatch in spring and the nymphs remain on the twigs and feed. The feeding on witch-hazel is what causes spiny galls to form. Each gall is hollow and contains numerous young aphids. As the aphids mature, they exit the gall and fly to their alternate host, the river birch. Meanwhile, the overwintering aphids on river birch move to new leaves in spring and give birth to young aphids that feed and live on leaves. These aphids eventually migrate to witch-hazel to feed on the flower buds and complete their life cycle.

Management: Leaf damage is a cosmetic problem and trees are not severely harmed. Aphid populations can be reduced by spraying the underside of the leaves with a hard stream of water.

Suggested reading: http://entweb.clemson.edu/eiis/pdfs/to17.pdf
http://www.entomology.umn.edu/cues/Web/063Aphids.pdf

Cynipid wasp galls on elm

Galls caused by Cynipid wasps (Family Cynipidae) were recently found on Accolade elm (*Ulmus* 'Morton'), and like most galls they're nothing to really worry about. Galls are irregular plant growths that

occur on leaves, buds, bark, twigs, roots, and flowers of many plant species. Most galls are caused by irritation or stimulation of plant cells due to feeding or egg-laying by insects such as mites, midges, aphids, and wasps. Some galls are the result of infection by bacteria, fungi, or nematodes.

Management: Although the leaves may seem unsightly, and there may be some early leaf drop, these galls do not affect tree health so control is not required.

Suggested reading:http://www.extension.iastate.edu/Publications/IC417.pdf
http://www.extension.umn.edu/distribution/horticulture/DG1009.html

Pine tube moth

Pine tube moth (*Argyrotaenia pinatubana*) eggs were found on white pine (*Pinus strobus*) this week at The Arboretum. These small moths (14 mm wing span) overwinter as larvae (12 mm long) and emerge in early May. They lay their eggs on white pine needles and when the larvae hatch they web several needles together to create a tube. Here they will live and eat the needles until they pupate and emerge as adults, usually in June. There are two lifecycles per year and the eggs we're seeing now are likely the beginning of the second cycle.

Management: Pine tube moths are not considered harmful pests. During years of high populations the infestation may cause lage sections of the pine's needles to turn brown, but this is more of an aesthetic problem. To culturally reduce the population pick out the moth's tubes and remove them from the property.

Suggested reading:
http://ento.psu.edu/extension/christmas-trees/information/pest-fact-sheets/pine-tube-moth

Pest update: Diseases

Tobacco mosaic virus on tomato

Chris Henning, Chicago Botanic Gardens, reported that some of their tomatoes tested positive for tobacco mosaic virus (TMV) (verified by University of Illinois Extension). This Tobamovirus is capable of infecting several solanaceous hosts (potato and tomato) and according to the University of Minnesota extension (link below), ornamental plants including: tomato, pepper, petunia, snapdragon, delphinium, marigold, muskmelon, cucumber, squash, spinach, celosia, impatiens, ground cherry, phlox, zinnia, certain types of ivy, plantain, night

shade, and jimson weed.

TMV is a very stable virus that is capable of overwintering in infested plant debris, infested seeds, and in tobacco products. Yes, TMV-infested tobacco is used in tobacco products (cigarettes, cigars, chewing tobacco), but it is not harmful to humans. Unfortunately, this does make tobacco-users and plant-handlers potential TMV vectors, because there are no known insect vectors of this pathogen. Once a person handles infested plant material the viral particles remain on the hands or tools until washed off with soap. The particles can be transmitted to healthy plants innocently by handling or exposing them to the particles.

Flowers, leaves, and fruit can all be infected with TMV. The symptoms of infection include mottling, chlorosis, distortion, elongated and pointed leaves, stunting, and curling.

Management: Remove and destroy infested plant material. Even after removing as much infested material from gardens or soil as possible, do not plant other susceptible hosts in the same location for two years (Agrios, 2005).

Cited link: http://www.extension.umn.edu/distribution/horticulture/dg1168.html

Cited literature:
Agris, George N. 2005. Diseases caused by rigid rod-shaped ssRNA viruses - Diseases caused by Tobamoviruses: Tobacco Mosaic. *Plant Pathology*. 5th ed. Elsevier Academic Press. Pp. 757-8.

Sooty mold

Sooty mold was found on alder (*Alnus glutenosa*) due to the previously reported woolly alder aphid infestation. Sooty mold looks like a black coating and lives on the surfaces of leaves. To be sure it is sooty mold, try rubbing it off the leaf. It should come off relatively easily. The black coating is actually a dark fungus. These are saprophytic fungi that live on insect honeydew (sugary insect excrement).

If you see sooty mold, look for the insect that created the honeydew, which could be scale, aphids, or other sap suckers. Sooty molds harm plants indirectly by blocking out light and reducing photosynthesis. They have no host preference as far as we know. There are two types of sooty mold growth. The first is growth on leaves, which lasts for the life of the leaf. The second is a persistent growth on stems and twigs of woody plants and also on outdoor structures and furniture. They are normally considered an aesthetic problem.

Management: Sooty mold is best controlled by controlling the honeydew-producing insect. Remember, you need to identify the insect to control it. Ohio State University claims that a strong spray of water can be used to dislodge the mold growth from many plants.

Suggested reading:http://plantclinic.cornell.edu/FactSheets/sooty/sootymold.htm
http://na.fs.fed.us/spfo/pubs/howtos/ht_sooty/ht_sooty.htm

Pest update: Abiotics

Chlorosis

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://urbanext.illinois.edu/soiltest/. 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:

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 the following:

- 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

Abiotic and bacterial leaf scorch

Some of our newly planted trees have begun to show signs of abiotic leaf scorch. This common problem can result during periods of drought when roots are unable to supply enough water to replace what is used by the leaves. Symptoms include interveinal and margin leaf browning. All leaves on a branch are more or less uniformly affected. Severe abiotic leaf scorch causes leaves to wilt and drop prematurely.

Some symptoms of abiotic leaf scorch appear similar to those of bacterial leaf scorch caused by the bacterium *Xylella fastidiosa*. This bacterial disease occurs on many tree species including elm, oak, maple, mulberry, and sycamore. Trees infected with *X. fastidiosa* exhibit marginal leaf browning, often bordered by a pale halo. Leaf discoloration begins at the leaf margin and moves toward the midrib. Trees typically begin to show bacterial leaf scorch symptoms during early to mid summer. These symptoms will progressively worsen until leaf drop in the fall. Symptoms recur each year and spread over the tree's crown; thus, reduction in growth and dieback are common in affected trees. Bacterial leaf scorch spreads systemically and causes slow decline and death of a tree.

Abiotic leaf scorch Management:

Abiotic leaf scorch can be reduced through proper management practices. Trees and shrubs should be planted in well-drained soil. During periods of drought, irrigate to a depth of 6 to 8 inches. Recently transplanted trees and shrubs should receive at least one inch of water per week. Heavily compacted soil will

reduce water flow to the plants so loosen surface soil in compacted areas.

Bacterial leaf scorch Management:

Bacterial leaf scorch is transmitted by xylem-sap feeding insects such as spittlebugs and leafhoppers. Avoid wounding susceptible trees to prevent infection by these vectors. Infected trees should be removed to prevent spread to healthy trees. There is no known effective preventative treatment or cure for bacterial leaf scorch. Trunk injections with antibiotics have been shown to suppress symptoms and delay tree death. Pruning infected branches has met with limited success.

Suggested reading:http://www.apsnet.org/online/feature/bls/
http://extension.missouri.edu/publications/DisplayPub.aspx?P=G6881

What to look for in the next week: woolly larch adelgid, mosaic viruses on hackberry, ash, and katsura, spiny elm caterpillar, tussock moth larvae, lacebugs, hedgehog gall

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, and Jack Leider. Your hard work is appreciated.

The Plant Health Care Report is prepared by Stephanie Adams, M.S., Plant Health Care Technician, and edited by Fredric Miller, Ph.D., research entomologist at The Morton Arboretum and professor at Joliet Junior College; Sharon, Yiesla, Plant Clinic Assistant; 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 .