Plant Health Care Report

The Morton Arboretum

Scouting Report of The Morton Arboretum

June 4, 2010 **Issue 2010.08**

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.

Quick View

Weekly reminder
What to look for in the next week

This week's sightings:

Insects

- Hawthorn leafminer
- Ailanthus webworm
- Cottony maple scale
- Oak bullet gall
- Froghopper
- Pine bark adelgid
- Spindle gall
- Pine false webworm
- Oak leafroller

Diseases

- Downy leaf spot

Abiotics

- Chlorosis
- Abiotic and bacterial leaf scorch

What indicator plant is in bloom at The Arboretum?
Hills of snow hydrangea (*Hydrangea arborescens* 'Grandiflora') (Figure 1)

Accumulated Growing Degree Days (Base 50): 567.5
Accumulated Growing Degree Days (Base 30): 2109.5

Figure 1 Hills of snow hydrangea (*Hydrangea arborescens* 'Grandiflora')

Fungus of the week*: Phellinus robiniae*
Woody of the week: Tulip poplar (*Liriodendron tulipifera*)

Degree Days and Weather Information

As of June 2, 2010, we are at 567.5 base 50 growing degree days (GDD), which is approximately 13 calendar days (158 GDD) ahead of 2009 at this time, and ahead of (57 GDD) the historical average (1937-2009). In the past week it has rained 7.04 cm (2.77 in), 12.6 cm (4.96 in) precipitation in May, and 32.7 cm (12.86 in) for the year.

Location	Growing Degree Days through June 2	Precipitation (in) between May 28 – June 2
The Morton Arboretum (Lisle, IL)	567.5	2.77
Chicago Botanic Garden (Glencoe, IL)*	553.5	0
Chicago O'Hare*	609	0.26 (5/26-6/1)
Aurora, IL**	607.4	
Carbondale, IL **	1004.7	
Cahokia, IL**	921.2	
Champaign, IL**	786	
DuPage County Airport (West Chicago, IL)**	600.2	
Decatur, IL**	813.8	
Lawrenceville, IL**	1019.6	
Mattoon, IL**	841.1	
Moline, IL**	736.1	
Peoria, IL**	781.2	
Quincy, IL**	794.1	
Rockford, IL**	605	
Springfield, IL**	876.8	
Sterling, IL**	670.9	
Waukegan, IL**	441.8	
Wheeling, IL**	532.2	

*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

Weekly Reminder:

Everyone wants the perfect landscape, but sometimes we all get anxious and do certain tasks when it's the wrong time. One of these things is to not walk in gardens when the soil is wet. When the soil is wet walking on it results in soil compaction, and makes it more difficult for plant roots to grow. When it is necessary to water your plants it's best to water in early morning or evening. If you're not sure whether you need to water, use a shovel and dig down about 8 inches in gardens, and 16 inches for trees to see if the soil is moist. If the soil isn't moist, it's time to water.

What to look for in the next week:

Black spot on elm, black pine weevil, ash yellows, elm yellows, spiny elm caterpillar, rose rust, rose midge, oak shothole leafminer, currant spanworm, and mosaic viruses

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 include: Ann Klingele, Loraine Miranda, Fritz Porter, and Jack Leider. Your hard work is appreciated.

This Week's Sightings…

Hawthorn leafminer

Figure 2 Hawthorn leafminer *(Profenusa canadensis)* mining damage

Hawthorn leafminers *(Profenusa canadensis*) (Figure 2) are creating mines on leaves of cockspur hawthorn *(Crataegus crus-galli*). The hawthorn leafminer is a native sawfly. The mines usually appear on the distal end of the leaf instead of all along the midrib as is common with many other leaf miners. When the mines are larger, the leaves will almost look blighted. You can see the leaf miner by holding the leaves up to the sun; you will find frass and larvae between the upper and lower epidermis (Figure 3).

Figure 3 Hawthorn leafminer seen inside a leaf

Control: The effect of the mines is usually just aesthetic. Since the insect overwinters in the ground, destroying fallen leaves does not help control them. For chemical control, refer to the *Commercial Landscape and Turfgrass Pest Management Handbook 2010* (CPM) or *Home, Yard and Garden Pest Guide* (HYG).

Suggested reading:
http://ppdl.org/dd/id/hawthornleafminer-hawthorn.html

Figure 4 Ailanthus webworm caterpillar

Ailanthus webworm

Ailanthus webworm (*Atteva punctella*) caterpillars (Figure 4) were found on corkwood (*Leitneria floridana*) in the eastern wetlands at The Morton Arboretum. The caterpillars have sparse light hairs, a broad stripe down their backs that has been described as olive-green, and alternating black and white stripes along their sides. They cluster together in a loose web and feed on leaves from within the web. This insect is usually seen on tree-of-heaven (*Ailanthus altissima*), one of our least favorite, weak-wooded, weedy, smelly trees.

Control: Here at the Arboretum, we tear the nests out of the tree and stomp on the webworms, thus destroying the webworms. *Bacillus thuringiensis* var. kurstaki (*Btk*) could also be used to control young larvae, but the spray needs to penetrate the nest to be effective. Btk is not as effective against older larvae. Although ailanthus webworms are capable of defoliating their host, they rarely do.

Suggested reading: http://www.uark.edu/ua/arthmuse/ailamoth.html

Cottony maple Scale

Figure 5 Female adult cottony maple scales (*Pulvinaria innumerabilis*)

Fuzzy growths have been found on buckeye twigs. These growths are female adult cottony maple scales (*Pulvinaria innumerabilis*) (Figure 5). The scales themselves are 0.64 cm (0.25 in) long, flat, oval, brown and have white, cottony egg masses (ovisacs) protruding from the rear. The cotton is actually waxy threads and the ovisac may contain over 1,500 eggs. Their preferred hosts are red and silver maple, but they also attack other maples, white ash, hackberry, dogwood, apple, oak, boxelder, beech, poplar, linden, and other hardwoods. At this point, each scale looks like a kernel of popcorn. The eggs will hatch soon into crawlers that migrate to the underside of leaves to feed. Mated females migrate to twigs to overwinter. When heavily infested, leaves may yellow and fall off prematurely, or branches or twigs may die. Cottony maple scale creates honeydew (liquid insect feces) which drops onto leaves below. Sooty mold may colonize the honeydew, resulting in less photosynthesis in the leaves.

Control: Cottony maple scale has a lot of natural enemies. Dormant oil can be used in spring before leaves emerge. To achieve optimum results, control measures should be aimed at the crawlers. They should be active by late June to early July. Refer to the CPM and HYG for specific chemical recommendations. In the meantime, you can pick them off and destroy them.

Suggested reading: http://ohioline.osu.edu/hyg-fact/2000/2019.html

Oak bullet gall

Figure 6 Oak bullet gall

Oak bullet gall (Figure 6) 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 2.1 – 3.2 mm (1/12 - 1/8 in) 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: Chemical control for these wasps is not effective. An Iowa State Extension website says that one control method "developed for young host trees [is to] remove and destroy the larger galls (10 mm and larger) in September, but leave the smaller galls (9 mm or less) on the host twigs. The smaller galls will have natural enemies in them and these insects will then emerge the following spring to parasitize any new galls formed on this or nearby hosts." For more information follow the link below.

Suggested reading: http://www.extension.iastate.edu/newsrel/2004/may04/may0414.html

Froghoppers

Froghoppers (Figure 7) were recently found on black walnut (*Juglans nigra*). Froghoppers are in the same family as spittlebugs, Cercopidae. Froghoppers cause stippling of the leaves due to their feeding, but overall cause little damage.

Figure 7 A froghopper (hash marks in mm)

Spindle gall

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.

Spindle leaf galls were found on the leaves of wild black cherry (*Prunus serotina*) (Figure 9). The galls generally appear as small red bumps or spindle-like protrusions on leaf surfaces. They are very interesting to look at. These particular galls are caused by eriophyid mites that overwinter in bark crevices or wounds. The mites become active in spring and migrate to feed on expanding leaf buds.

Figure 9 Spindle leaf galls on black cherry (*Prunus serotina*)

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

Pine false webworm

A pine false webworm (*Acantholyda erythrocephala*) nest (Figure 10) was found on a scotch pine (*Pinus sylvestris*) in the China collection at The Arboretum. This sawfly belongs to a group of insects in the order Hymenoptera, which includes wasps, bees, hornets, etc. The adults are present from May to early June. The wasp-like adults have a shiny blue-black body. Females have a small area of yellow to yellow-orange on the front of their head. Females are 11.1 – 12.7 mm (7/16 - 1/2 in) long and males are slightly smaller at 9.5 mm (3/8 in) long. After mating, the females lay groups of 2-6 eggs side by side on pine needles. When the larvae hatch, they move to the base of last year's needles. Larvae then construct loose webbing and feed on needles. They prefer to feed on old foliage of pines; they will consume needles of the current year's growth

Figure 10 Pine false webworm nest

only when high infestations occur. The larvae are green with two small antennae-like projections that stick out of the tip of their abdomen. Feeding lasts for 18-20 days. Then the mature larvae drop to the ground, burrow into the soil and remain dormant until the next spring when they emerge as an adult. Only one generation per year occurs.

The false pine webworm differs from the true pine webworm by having no silken tunnels present; they have smaller nests and contain fewer larvae per nest. But the most important distinction is that the true pine webworm belongs to the moth and butterfly order Lepidoptera.

Control: Small numbers of nests can be pruned out and destroyed. Refer to the CPM and HYG for chemical control.

Suggested reading: http://bugs.osu.edu/~bugdoc/Shetlar/factsheet/christmasstree/pine_false_webworm.htm

Figure 11 Oak leafroller larvae (*Archips semiferana*)

Oak leafroller

Oak leafroller larvae (*Archips semiferana*) (Figure 11) were found on bur oak (*Quercus macrocarpa*). There are about 200 species of leafrollers that attack ornamental plants but they cause little damage. These pale yellow caterpillars roll up leaves and feed from within the shelter of the rolled-up leaf, skeletonizing, and tattering the leaves (Figure 12).

Figure 12 Leaf rolling and feeding damage due to oak leafroller

Control: None required as leafrollers usually cause minimal damage.

Downy leaf spot

Downy leaf spot, also known as white mold or white leaf spot, caused by the fungus *Microstroma juglandis*, has been found on hickory (*Carya* sp.). Powdery, white, fuzzy spots that are more concentrated near the lea veins are forming on the underside of the leaf surface (Figure 13). Corresponding chlorotic spots appear on the upper leaf surface. These spots vary in size and may coalesce to form large angular lesions (Figure 14). The fungus may also cause witches' brooms near the ends of branches with stunted and yellowish leaves that may drop in early summer.

Control: Downy leaf spot attacks hickories and walnuts but is not a significant threat to the trees. Brooms can be pruned to improve the appearance of the tree. Chemical control is not recommended.

Suggested reading:
http://plantclinic.cornell.edu/FactSheets/hickorydownyleafspot/hickorydownyleafspot.htm

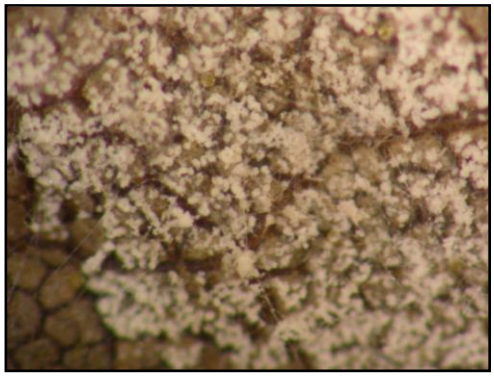

Figure 13 *Microstroma juglandis*, the fungus that causes downy leaf spot, as found on the underside of a host leaf

Figure 14 Angular lesions on a shagbark hickory leaflet

Chlorosis

White oaks (*Quercus alba*) are starting to show signs of chlorosis (Figure 15). 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.

Figure 15 White oak (*Quercus alba*) with symptoms of chlorosis

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 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 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

Abiotic and bacterial leaf scorch


Figure 16 Abiotic scorch symptoms on white oak

Some of our white oaks (*Quercus alba)* have begun to show signs of abiotic leaf scorch (Figure 16). 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 (Figure 17). 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 Control:

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 Control:

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

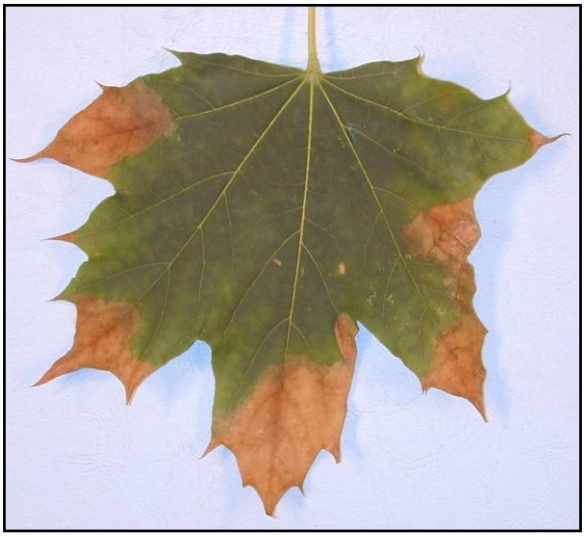
Figure 17 Marginal browing due to scorch

Fungus of the week: *Phellinus robiniae*

Figure 18 *Phellinus robiniae* on black locusts (*Robinia pseudoacacia*)

Phellinus robiniae is an interesting fungus because it is one of the few fungi that are able to infect and decay black locusts (*Robinia pseudoacacia*), where it causes a white rot. Black locusts are known to be extremely decay resistant, which is why their wood was commonly used as fence posts. *Phellinus robiniae* is a very hard perennial conk fungus that has white spores. The conks may grow 10-30 cm (4-12 in) across and 5-15 cm (2-6 in) thick. Schwarze, *etal.* (2000) states that they are able to live to 15 – 20 years old.

Woody of the Week

by Jaime Horn

The Woody of the Week is written to aid in basic botanical identification of the featured plant, while adding to the reader's knowledge bank of woody plants. Many of the terms used are standard for describing plant morphology and may require definitions for complete understanding. There are several publications on botanical terminology. Two of these publications are *Plant Identification Terminology: An Illustrated Glossary* by J.G. Harris and M. Woolf Harris and the Plant Morphology section in Michael Dirr's *Manual of Woody Landscape Plants* (page xiv) for pictures and descriptions.

Figure 19 Tuliptree, Yellow Poplar, Tulip Poplar (*Liriodendron tulipifera)*

Tuliptree, Yellow Poplar, Tulip Poplar (*Liriodendron tulipifera)*

Family: Magnoliaceae
Native: Wisconsin to Massachusetts to Florida. Cultivated 1663.
Mature Size: 70-90', Pyramidal becoming oval-rounded with maturity
Hardiness: Zones 4-9
Foliage: Very unique and distinguishable. Alternate, simple, up to 8"x8", truncate apex (notched), 3-4 lobes per side, bright green turning yellow in fall.
Bud: Valvate terminal bud, green to red, bloomy, dotted with white lenticles, looks like a duck's bill.
Flower: 2-3" tall, held upright, 6 yellowish petals in 2 rows with 3 reflexed sepals, orange splotches on corolla, resemble a tulip, occur in May to early June, extremely beautiful when viewed up close, but not showy overall. Pollinated by honeybees.
Fruit: 2-3" long, looks like a cone, aggregate of samaras, turns brown around October and sheds samaras through winter, a good identification feature.
Bark: Deeply furrowed creating a diamond-like pattern, easily recognizable, grayish-brown.
Culture/Usage: Best sited in full sun and moist soil, Tuliptree belongs in large open spaces in the landscape. Its large size limits its usage in the residential gardens. In dry soil, leaf scorch is a problem. Unfortunately, it may be plagued by a variety of insects and diseases, including leaf spot, canker, powdery mildew, root rot, *Verticillium* wilt, aphids, and scale. Winter ice damage may be an issue. However, its beautiful mature habit, fall color, and interesting flowers and foliage

make it a worthy specimen plant. Many cultivars are available, including those with variegated leaves. Its wood is used to make furniture.

GET AN UP-CLOSE VIEW!

Head to the Research Parking Lot to fully enjoy this tree's unique flowers. A mature specimen is planted at: H-40/97-10.

Interesting fact of the week:

The flowers of this tree are special enough that both the Genus and the specific epithet were derived from Greek words describing them. *Liriodendron comes* from *Leirion*, a lily and *dendron*, a tree. The name *tulipifera* appropriately means tulip-bearing.

Possible problems include: Chlorosis, scale, powdery mildew, aphids, and cankers

---

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; and 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:

David Arora. 1986. *Mushrooms Demystified 2nd ed*. Ten Speed Press. Berkeley, CA. ISBN-13: 0-89815-169-4.

Michael Dirr. 1998. *Manual of Woody Landscape Plants*. ISBN-10: 0-87563-800-7.

Harris, J.G. and M. Woolf Harris. 2001. *Plant Identification Terminology: An Illustrated Glossary*. ISBN-13: 978-0964022164.

Donald A. Orton. 2007. *Coincide, The Orton System of Pest and Disease Management*. Publisher website: http://www.laborofloveconservatory.com/.

F.W.M.R. Schwarze. 2008. *Diagnosis and Prognosis of the Development of Wood Decay in Urban Trees.* ISBN: 978-0-646-49144-8.

F.W.M.R. Schwarze, J. Engels, and C. Mattheck. 2000. *Fungal Strategies of Wood Decay in Trees.* ISBN: 3-540-6705-2.

William T. Stearn. 2002. *Stearn's Dictionary of Plant Names For Gardeners*. ISBN-10: 088192556X.

University of Illinois. 2010. *The 2010 Commercial Landscape & Turfgrass Pest Management Handbook*. https://pubsplus.uiuc.edu/ICLT-10.html.

University of Illinois. 2008. *Home, Yard & Garden Pest Guide.* https://pubsplus.uiuc.edu/C1391-08.html.

UIPlants: The Woody Plant site for the University of Illinois (http://woodyplants.nres.uiuc.edu.).

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.