

Plant Health Care Report

Scouting Report of The Morton Arboretum

August 21, 2015

Issue 2015.11

Our report includes up-to-date disease and insect pest reports for northeastern Illinois. You'll also find a table of accumulated growing degree days (GDD) throughout Illinois, precipitation, and plant phenology indicators to help predict pest emergence. Arboretum staff and volunteers will be scouting for insects and diseases throughout the season. We will also be including information about other pest and disease problems based on samples brought into The Arboretum's Plant Clinic.

**This is our last full issue of the year.
There will be one more Growing Degree Day issue published next week.**

Quick View

What indicator plant is in bloom at the Arboretum?

Seven-son flower (*Heptacodium miconioides*) is in very early bloom (Fig. 1)

Accumulated Growing Degree Days (Base 50): 2066.5 (as of August 20)

Accumulated Growing Degree Days (Base 30): 5002.5 (as of August 20)

Insects and insect relatives

- Emerald ash borer and fringtree
- Magnolia scale update
- Bald cypress rust mites
- Boxelder bugs and other home invaders
- Brown marmorated stink bug
- Egg hunt
- Another gall

Diseases

- Rust on lawns
- *Verticillium* wilt
- *Phytophthora* and other root rots

Miscellaneous:

- Watering into autumn
- Seasonal needle drop



Figure 1 Seven-son flower (photo: Sharon Yiesla)

Degree Days and Weather Information

As of Aug 20, we have accumulated 2066.5 base-50 growing degree days (GDD). The historical average (1937-2013) for this date is 2160 GDD₅₀.

Location	B ₅₀ Growing Degree Days Through Aug 20, 2015	Precipitation (in) Aug 14-20, 2015
Carbondale, IL*	3111	
Champaign, IL*	2670	
Chicago Botanic Garden**	1949 (as of 8/19)	2.15 (8/12-18)
Chicago O'Hare*	2366	
Kankakee, IL*	2342	
The Morton Arboretum	2066.5	2.28
Northbrook, IL**	1998.5 (as of 8/19)	2.05 (8/12-18)
Quincy, IL*	2795	
Rockford, IL*	2035	
Springfield, IL*	2777	
Waukegan, IL*	2002	

**Thank you to Mike Brouillard, Northbrook Park District and Chris Beiser, 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/>

How serious is it?

This year, articles will continue to be marked to indicate the severity of the problem. Problems that can definitely compromise the health of the plant will be marked “serious”. Problems that have the potential to be serious and which may warrant chemical control measures will be marked “potentially serious”. Problems that are seldom serious enough for pesticide treatment will be marked “minor”. Articles that discuss a problem that is seen now, but would be treated with a pesticide at a later date, will be marked “treat later”. Since we will cover weeds from time to time, we’ll make some categories for them as well. “Aggressive” will be used for weeds that spread quickly and become a problem and “dangerous” for weeds that might pose a risk to humans.

Pest Updates: Insects and insect relatives

Emerald ash borer and fringetree

It was recently reported in an Environmental Entomology article, by Dr. Don Cipollini and Chad Rigsby, that emerald ash borer (EAB) (*Agrilus planipennis* Fairmaire) was potentially found in white fringe tree (*Chionanthus virginicus*) at The Morton Arboretum. White fringe trees and ash trees all belong to the same family, Oleaceae, the olive family. The authors indicated that D-shaped exit holes and feeding galleries under the bark, similar to the activity of EAB, were found in 7 of the 16 fringe trees on the property. No larvae or adult EABs were found on any of the symptomatic trees.

In late 2014, emerald ash borers were confirmed to be infesting white fringe trees in southwestern Ohio by the USDA-APHIS. Researchers and regulatory agencies are currently surveying to see how wide spread the fringe tree infestation is, which is what brought Dr. Cipollini to The Morton Arboretum in 2015. Dr. Cipollini's findings, although preliminary, warrant further investigation of all species that belong to the olive family to see if infestation has occurred.

Finding and identifying life stages (adult, larva, or pupa) is the only way an invasive species can be verified and officially announced by the state of Illinois. Because this requirement has not been met, according to the Illinois Department of Agriculture, EAB has not been officially found on fringe tree, but the issue is being investigated.

If you have questions or concerns on emerald ash borer or any other plant health issue, please contact The Morton Arboretum's Plant Clinic.

Magnolia scale update

In issue 7 (June 26), we reported on magnolia scale. The population of magnolia scale is very high this year. In issue 7 we mentioned that crawlers might start to emerge in late August or early September. Some universities report that the beginning of emergence should start around 1900 to 1950 GDD. We have passed that mark. Horticulture staff at The Morton Arboretum brought in samples this week that do have crawlers on them (Fig. 2), so the time to treat with insecticides is here. Before you spray, check for predators that may be helping you. The samples brought in also had an adult twice-stabbed ladybug as well as some larvae (Fig. 3) of another ladybug species. Here is the tricky



Figure 2 Crawlers of magnolia scale

part; the larvae of this species look a lot like mealybugs! If you find these beneficial insects present, consider treating with insecticidal soap. This will kill the scale but have limited effects on the predators.



Figure 3 ladybug larva

Bald cypress rust mites (minor)

Bald cypress rust mites (*Epirimerus taxodii*) were found feeding on bald cypress (*Taxodium distichum*). These rust mites are about the size of dust. They look like tiny, pale, wedge-shaped mites. They crawl over the surface of needles, rasping through the epidermis and extracting the cell contents. The resulting damage first looks like very fine spots called stippling (Fig. 4). Occasionally, leaf tips become dwarfed and distorted. Needles eventually become yellowish and then reddish brown. Inner needles are usually affected first. The mite population generally explodes with the onset of warm weather, and thousands can be found on a single leaf.



Figure 4 Stippling from bald cypress rust mites

Management: Severe infestations can unduly stress trees and chemical control may be warranted. Bald cypress is sensitive to horticultural oils so these products should not be used for control.

Good web site: http://bygl.osu.edu/archive/bygl2009_864.html#5

Boxelder bugs and other home invaders (minor)

This is our last full issue for the season, so let's take a moment to look at some problems that might arise in fall. When the weather turns cold, some pests will become home invaders.

Boxelder bugs (*Boisea trivittata*) are usually the number one complaint for home invaders. The Plant Clinic has not yet received any reports of this nuisance pest, but it is almost certain to show up as the weather cools down. These sap-feeding insects feed on sap of seeds, flowers, and leaves of boxelders (*Acer negundo*). Their feeding causes little damage to the tree. They are considered to be a nuisance when large numbers of them appear in homes, especially in fall and spring. Nymphs are bright red when they first hatch, developing black wing pads over time.

Adults are about ½ inch long, have three red or orange lines in back of their heads, and have black wings with red lines and a red abdomen (Fig. 5). Boxelder bugs overwinter as adults in protected sites. Since they consider your house to be a protected site, if you have cracks in your foundation or around your windows, they will enter your house through those cracks in fall. They do no harm in the house but are very annoying.



Figure 5 Boxelder bug nymph (upper) and adult (lower)

While boxelder bugs show up like clockwork every year, some home invaders are occasional guests. These include the multi-colored Asian lady beetle, the leaf-footed beetle and squash bugs. The **multi-colored Asian lady beetles** are beneficial insects that eat pests like aphids. In fall, they can become an annoyance when they enter the home, sometimes in large numbers. They are not only annoying, they can bite! They can be yellow, red or orange in color and may have no spots or as many as 19. The front of the body is cream colored with a black 'M' (perhaps a monogram for 'multi-colored'?). Go to <http://bugguide.net/index.php?q=search&keys=Harmonia&search=Search> for photos.

Leaf-footed bugs and **squash bugs** often enter homes one at a time and so are easy to manage. Go to <http://bugguide.net/node/view/16073/bgimage> and <http://bugguide.net/index.php?q=search&keys=squash+bug&search=Search> to see pictures of these home invaders.

Management: Do not use insecticides inside the home. Caulk around doors and windows to minimize entry by the insects. Keep screens in good repair. Insects that do enter the home can be removed with a vacuum or manually. Do not crush boxelder bugs or ladybugs as they can leave a stain. The leaf-footed bug is related to stink bugs and will make a stink when handled. Squash bugs can make a stink and a stain when crushed. A vacuum or hand-held vacuum may be needed to remove them. If boxelder bugs are accumulating on the outside of the house, they can be doused with soapy water.

Good website: <http://www.mortonarb.org/trees-plants/plant-clinic/help-pests/boxelder-bugs>

Brown marmorated stink bug (potentially serious)

Speaking of home invaders: Brown marmorated stink bugs (BMSB) are showing up in the Chicago area. This insect has been reported in Illinois before, but its presence here is thought to be limited at this time. These insects overwinter in houses and become active again in spring. BMSB will feed on a variety of hosts including many fruit, vegetable and field crops, reducing yield on those crops. They have become a serious pest on crops in some states.

There are other insects that resemble the BMSB, so check the websites listed below to see more pictures of this insect. The insect is similar in shape to other stink bugs (a somewhat 'shield-shaped' body), but the edge of the body has alternating black and white bands. The antennae will have light-colored bands on them. Overall, the body has a mottled appearance. When the weather cools off, adults will look to overwinter in homes, much like boxelder bugs.

The presence of BMSB in Illinois is being tracked by the Illinois Cooperative Agricultural Pest Survey. If you think you have found this insect in your area, contact Kelly Estes at kcook8@illinois.edu. She may want to see digital photos of the insect or the actual insect itself to confirm identification.

Management: Managing this pest in the home is similar to managing boxelder bugs in the home. Caulk cracks and keep screens in good repair. Physically remove the insects in the home with a vacuum cleaner. These are stink bugs and they do create a stink when threatened so removal by hand could be tricky. After removal by vacuum, the vacuum cleaner may have a smell for a while.

Good websites with photos for identification:

http://ohioline.osu.edu/hyg-fact/pdf/FS_3824_08.pdf

<http://njaes.rutgers.edu/stinkbug/identify.asp>

Egg hunt

When fall and winter come, you may think you are done with the landscape. Not so! We can take this time to be proactive and try to reduce insect populations for next year. Many insects overwinter as eggs. If we can find those eggs and destroy them, we will have fewer pests to kill next year. Destroying one egg mass may get rid of 500-1000 potential insects, depending on the species.

The key is knowing what to look for. Here are some examples.

Bagworm lays its eggs in bags formed from plant parts of the host plants. The small bags will be found hanging on the host plant all through the fall and winter (Fig 6). **Eastern tent caterpillar** egg masses encircle small stems on trees and have a shiny, gray appearance. **Gypsy moth** egg clusters can be found on trees, homes and outdoor furniture. The masses are covered with buff-colored hairs from the female's body. **Viburnum leaf beetles** lay their eggs in the tips of viburnum twigs (Fig. 7). If we clip those twigs off in fall and winter, we can minimize populations for next spring. This would be particularly effective with the viburnum



Figure 6 Bagworm



Figure 7 Viburnum leaf beetle eggs in stem (photo: U of I)

leaf beetle. This is a fairly new pest in our area, and if we can remove twigs with eggs in them, it will help us get ahead of them a little bit.

Another gall (minor)

We really couldn't publish our last issue without one more gall. This is an interesting one because it is often mistaken for a fungal leaf spot. On the Arboretum grounds this week we found tuliptree (*Liriodendron tulipifera*) leaves infested with eyespot gall. Eyespot gall is caused by a midge (a tiny fly-like insect). The gall looks a bit like an eye (Fig 8). The leaf tissue inside the spot turns brown and often falls out like some fungal diseases do.



Figure 8 eyespot gall on tuliptree

Management: As with most galls, management is not needed.

Pest Updates: Diseases

Rust on lawns (minor)

Orange spores are coming to a shoe near you, courtesy of rust on turfgrass. This disease generally shows up in July and August when the grass slows its growth due to heat and dryness. The slow growth of the turf allows the disease to attack the grass. The heat and dryness came late this year and so did the rust. Turfgrass rust is caused by a *Puccinia* sp. All turfgrasses can be infected by many different species of rust fungi, and Kentucky bluegrass is one of the more rust-susceptible grass species.



Figure 9 Rust spores covering shoes

Initial symptoms of rust disease include yellow lesions on grass blades that enlarge over time and rupture to release orange spores. When you walk across the lawn, your shoes pick up the orange spores and turn orange (Fig. 9). The spores are wind-blown and splashed by rain to new infection sites on grass.

Management: There is no permanent shoe damage, and the orange spores can be easily wiped off. Grass rust is usually not severe enough to warrant use of fungicides, and sound management practices will keep this disease in check. Management practices that spur a little growth will minimize rust. These practices include watering and fertilizing with nitrogen. While these practices may apply to a highly managed lawn, they may not be great for the

average home lawn. Watering the lawn in summer is not really a priority since the lawn can go dormant and come back when the rain and cooler temperatures return. Fertilizer may be harmful to an unwatered lawn. When the rain returns and the grass grows again, the rust usually diminishes. Some management techniques that apply to any lawn include mowing at the height recommended for the particular turf species and using rust resistant varieties or blends of turfgrass when starting new lawns. For the most part, turfgrass rust is a relatively minor disease that we can live with.

Good website: http://ipm.illinois.edu/landturf/diseases/turfgrass_rust/index.html

***Verticillium* wilt (serious)**

Verticillium wilt has been confirmed on magnolia and is suspected on a number of other species. *Verticillium* wilt is a fungal disease that affects over 300 herbaceous and woody plants.

The disease is caused by many host-specific strains of two soil-borne fungi, *Verticillium albo-atrum* and *V. dahliae*. *Verticillium dahliae* is believed to be the predominant species attacking trees in the Midwest. The disease attacks many herbaceous plants as well as woody plants and has both acute and chronic (long-term) symptoms.

This soil-borne fungus remains in the soil in a type of dormancy until unsuspecting roots cross their path. The fungus enters the root through wounds or direct penetration. Once inside a root, the fungus colonizes water-conducting tissue (xylem) and gradually spreads upward through the plant. The fungus produces toxins that cause the plant to block off the xylem in an attempt to limit the growth of the fungus. This cuts off the flow of water which results in leaf wilting, yellowing and browning (Fig. 10), early fall color and branch dieback (these are the acute symptoms). The wood beneath the bark is streaked in many species because of the “plugging” response. Typically when a wilting branch is cut in cross section, or the bark peeled back, brown streaks (Fig. 11) can be seen in the outer ring of sapwood. Some plants, like ash and Japanese tree lilac, will not show streaking.



Figure 10 Wilting and dieback due to verticillium wilt



Figure 11 Streaking under bark due to verticillium

Verticillium can be a chronic problem, that is, killing a branch or two annually, or it can kill the whole plant in one season. Chronic symptoms may also appear such as: stunted, chlorotic, and deformed foliage; slow growth; and abnormal seed production.

Verticillium can be spread by seeds, tools, and in the soil and roots of new transplants and nursery stock. Once the fungus is introduced into soil it can survive for several years even in really bad conditions.

Symptoms are not enough to determine that a plant is infected with *Verticillium*. A culture lab should be used to verify the diagnosis. In case the tree dies and needs to be replaced, you want to replace it with a tree resistant to the *Verticillium* fungus.

Management: *Verticillium* wilt is difficult to control because of the pathogen's ability to hunker down and survive in the soil with or without a host plant. Fungicides are ineffective in controlling *Verticillium*. The best course of action is sanitation and prevention. Dead branches should be pruned out as they occur to help overall plant vigor. Because the disease can be transmitted via sap, sterilize pruning tools between cuts. Remove chronically infected trees.

Other control measures:

- Start with clean plant materials and soil.
- Plant trees in sites that are appropriate for the plant.
- Water during dry periods, but do not overwater.
- Use a three- to four-inch layer of organic mulch to retain moisture and prevent soil temperature fluctuation.
- Do not over-fertilize. Maintain a balanced fertility. Unbalanced nitrogen (too high or too low), too low potassium and too low phosphorous can lead to more disease.
- Avoid injuries to the roots, trunk, and branches.
- Plant resistant varieties.
- Remove severely infected trees and replace with plants that are not susceptible to *Verticillium*.

Good Websites:

<http://extension.cropsciences.illinois.edu/fruitveg/pdfs/1010.pdf>

<http://www.ipm.iastate.edu/ipm/hortnews/1998/3-13-1998/verticil.html>

<http://ohioline.ag.ohio-state.edu/hyg-fact/3000/3053.html>

<http://www.extension.umn.edu/distribution/horticulture/DG1164.html>

***Phytophthora* and other root rots (serious)**

This very rainy growing season has brought out a number of root rots. *Phytophthora* species are common culprits for landscape problems.

Depending on the host and the *Phytophthora* species, the infections can result in root rots, stem rots, and foliar blighting. There are many different microbes that can cause these plant problems. *Rhizoctonia* and *Pythium* root rots are also common in wet seasons.

Symptoms of any root rot infection include wilting, dieback, and blighting over the entire canopy (Fig. 12).

This is most easily recognized by standing back and looking at the entire plant. Symptoms are usually expressed as foliar dieback on the outer tips of the branches, while the other leaves wilt. If there are only a few branches showing symptoms of a problem, it is unlikely to be a root rot, but should probably be examined anyway.



Figure 12 *Phytophthora* on yew

Next, grab a shovel and begin to dig near the stem of the tree. This can be tricky because you don't want to damage the large-woody structural roots. Find the fine roots that form a fine webbed-network in the upper few inches of the soil. Cut a few off and take a knife or fingernail and scrape away the outer surface of the root. If the inside of the root is white or creamy white, the root is healthy. If the outer surface sloughs off in your hand, or the inside of the root is tan, brown, or red, there is a problem.

To positively identify which fungus is causing the problem is difficult and can only be done by looking at the roots under a microscope, or by growing the fungus out of the roots. For this, contact the University of Illinois Extension Plant Clinic (<http://web.extension.illinois.edu/plantclinic/>) to help you. There are also commercial labs that diagnose samples and some tree care companies that diagnose these problems.

Knowing which fungus is causing the problem is important when it's time to treat the problem, because there is no universal fungicide. And most fungicides used to treat root rots are regulated and require a Pesticide Applicator's License.

Once a root rot fungus has been introduced into the landscape, eradicating it is nearly impossible. The best cultural way to manage root rots is to prevent them. Make sure purchased plants are healthy and disease free. Check the roots while at the garden center by pulling them out of the containers. Also, prevent excess stress by planting the correct plant in the location.

Good websites: <http://www.ces.ncsu.edu/depts/pp/notes/oldnotes/odin13/od13.htm>

Miscellaneous

Watering into autumn

This has been an odd year for water. In spring it seemed to rain all the time. June was absolutely soaking wet. Then the tap turned off for about a month and the soil was dry. In the past week or so, heavy rains have made a comeback in many areas. As autumn comes on and the temperatures cool, there is often the assumption that the growing season is over and we can put the garden hose away. That really is not the case, even in a 'normal' year.

With autumn, we will start to see plants go dormant and perennials will even start to die back. The root systems of all are plants are still quite active and watering will help to keep them in good health. You can continue to water until the soil freezes. Pay special attention to evergreens. Since they retain their needles year round, they can continue to lose water. Make sure that all evergreens go into winter fully hydrated. If you are planting bulbs like tulips or daffodils, they will also need to be watered. When bulbs are planted, they need to grow a root system in the fall. That can be difficult to do if the soil is too dry.

Other areas that would need special attention are newly seeded or sodded lawns and any newly planted trees, shrubs or perennials. All these plants will need a good supply of water to help them become established. Newly planted trees and shrubs do not need to be watered every day. That is good for puppies, but not for trees. Water as needed. Check the soil to see how dry it is. Remember that on a newly planted tree there will be a limited root ball. Apply the water to the root ball area.

We need to modify our watering practices based on the rainfall we get this autumn. Consider purchasing a rain gauge for your yard so you can accurately determine how much rain you are receiving. Storms can be deceiving. A heavy storm may give the impression that a lot of rain fell, but a rain gauge will let you know how much rain really fell. Ideally for most established plants we want to deliver an inch of water per week. If the rain provides half an inch, we need to provide the other half. Try to do the watering all at once so we get a nice deep watering. Sprinkling a little bit everyday does not give the plant the water it needs, and it promotes fungal diseases (we have had enough of those already this season), not to mention what it does for your water bill.

Seasonal needle drop

Another phenomenon of fall is heading our way: seasonal needle drop (also known as normal needle drop). In autumn, many evergreens will drop older needles. This is a normal process. Needles on an evergreen live for a limited number of years. At the end of their lives, these needles will turn brown and eventually fall off. On some evergreens, such as white pine or arborvitae, this process can be very dramatic, making the evergreen look like it is dying. To

determine if your tree has a disease or is going through normal needle drop, check the location of the browning. Trees going through normal needle drop will have a fairly uniform brown appearance in the interior of the tree since this is where the oldest needles are located (Fig.13). After a few weeks the brown needles will fall off leaving the tree looking normal and healthy. Trees with a disease may have brown needles in various areas of the tree, depending on the disease, but the appearance will not be as uniform as that of needle drop. Diseased needles may eventually fall off, but the tree won't look healthy.



Figure 13 Seasonal needle drop on white pine

Good website:

<http://www.mortonarb.org/trees-plants/tree-and-plant-advice/horticulture-care/seasonal-needle-drop>



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The Plant Health Care Report is prepared by Sharon Yiesla, M.S., Plant Clinic Assistant and edited by Stephanie Adams, M.S. Research Specialist in Plant Health Care; Fredric Miller, Ph.D., Research Entomologist at The Morton Arboretum and Professor at Joliet Junior College; Doris Taylor, Plant Information Specialist, and Carol Belshaw, 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.

Thank you...I would like to thank the volunteers who will be scouting for us this season. They find most of the insects and diseases reported here. The Scouting Volunteers include: LeeAnn Cospers, Paul Duke, Deborah Finch-Murphy, Anne Finn, Ann Klingele, Loraine Miranda, and Bill Sheahan . Your hard work is appreciated. Thanks also to Donna Danielson who also provides scouting information to us.

Literature/website recommendations:

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/>

Additional information on growing degree days can be found at:

http://www.ipm.msu.edu/agriculture/christmas_trees/gdd_of_landscape_insects
http://extension.unh.edu/resources/files/Resource000986_Rep2328.pdf

The Commercial Landscape & Turfgrass Pest Management Handbook (CPM), for commercial applicators, and Pest Management for the Home Landscape (HYG) for homeowners from the University of Illinois, are available by calling (800-345-6087).

This report is available as a PDF at The Morton Arboretum website at <http://www.mortonarb.org/visit-explore/news-events/arboretum-news?tid=259>

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 PHCR should be directed to Sharon Yiesla at syiesla@mortonarb.org .

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