

Plant Health Care Report

Scouting Report of The Morton Arboretum

May 3, 2019

Issue 2019.3

Comments or concerns regarding PHCR should be sent to syiesla@mortonarb.org.

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.

We are continuing to use last year's format: full issues alternating with growing degree day (GDD) issues; focus on more serious pests; minor pests covered in shorter articles; alerts issued for new major pests. Readers who receive our email blasts that announce the newsletter is posted online will continue to receive them this year. To be added, please contact me at syiesla@mortonarb.org

Quick View

What indicator plant is in bloom at the Arboretum?

Eastern redbud (*Cercis canadensis*) is in early flower (Figure 1)

Accumulated Growing Degree Days (Base 50): 70 (as of May 2)

Accumulated Growing Degree Days (Base 30): 862.5 (as of May 2)

Insects/other pests

- Pine bark adelgid
- Spruce needleminer
- Elm flea weevil
- Larch casebearer
- Spring is a little late
- Eastern tent caterpillar
- European pine sawfly
- Gypsy moth

Diseases

- Boxwood browning
- Cedar apple rust
- Phomopsis tip blight

Weeds

- Bishop's weed

Miscellaneous

- Wise Use of pesticides



Figure 1 Eastern redbud (photo: J. Hagstrom)

Degree Days and Weather Information

We are once again offering Lisle readings right above the Arboretum readings. The spread between these two sites shows that temperatures can vary over a short distance, which means growing degree days can be quite variable as well.

As of May 2, we have 70 base-50 growing degree days (GDD). The historical average (1937-2018) for this date is 61 GDD₅₀. Since January 1, we have had 14.77 inches of precipitation. Historical average (1937-2018) for precipitation Jan-April is 10.25 inches.

Location	B ₅₀ Growing Degree Days Through May 2 , 2019	Precipitation (in) April 25-May 2, 2019
Carbondale, IL*	371	
Champaign, IL*	196	
Chicago Botanic Garden**	67 (as of 5/1)	4.54" (thru 5/1)
Chicago O'Hare*	123	
Kankakee, IL*	137	
Lisle, IL*	128	
The Morton Arboretum	70	4.67"
Quincy, IL*	245	
Rockford, IL*	92	
Springfield, IL*	227	
Waukegan, IL*	72	

**Thank you to 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/>

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

Pine bark adelgid (minor to potentially serious)

Our scouts are reporting a minor infestation of pine bark adelgid on white pine (*Pinus strobus*) this week. Pine bark adelgid (*Pineus strobi*) adult females secrete a protective white, woolly mass, which covers the light-yellow eggs (fig. 2) and can be found at the base of needles and on the bark of limbs and trunks (the scouts found it in both locations). This pest has five generations per year. The adelgid prefers white pine but also attacks Scots and Austrian pines. Healthy trees are not usually harmed by this adelgid, but high populations may require treatment.



Figure 2 Eggs of pine bark adelgid (see arrow)

Management: In mild cases, eggs and crawlers can be washed off now with a high-pressure water spray. In severe or repeated infestations, an insecticidal spray can be applied when the crawlers are out. Lady beetles, hover flies, and lacewings feed on adelgids, so if these predators are present, it is best to use an insecticidal soap or high-pressure water spray.

Spruce needleminer (minor)

Our scouts have found overwintering spruce needleminer larvae active on spruce (*Picea* spp.). Larvae overwinter in nests formed from silk, dead mined needles and frass (fig. 3). 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. Infestation and damage is usually minor.



Figure 3 Spruce needleminer damage

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.

Elm flea weevil (minor)

We are still using the name European elm flea weevil (*Orchestes alni*). Ohio State reports that this is a case of mistaken identity, and the pest is really *Orchestes steppensis* from Russia, not Europe (<https://bygl.osu.edu/node/1018>). No matter what we call them, the adults are already feeding on the newly emerging leaves of elms. This pest has been in our area for over a decade and has regularly caused foliage damage to elms during that time. Adult-feeding results in tiny shot holes (fig. 4) in the leaves, and heavy feeding can cause newly expanding leaves to wither and turn brown. After feeding, the female weevil cuts a cavity into the leaf mid-vein and inserts an egg. The hatching larvae create blotch mines at the leaf tips. Larvae feed for about 2-3 weeks, and then pupate within the mined leaf. Very heavy feeding can reduce photosynthetic capacity of the tree, thereby impacting overall tree vitality.



Figure 4 Elm flea weevil and damage

Management: Insecticides are effective in controlling adults and could be applied now. Depending on how long the insecticide is effective, several applications may be needed. However, spraying a large elm may not be practical, especially for a pest whose damage is relatively minor.

Good website:

<http://www.mortonarb.org/trees-plants/tree-and-plant-advice/help-pests/european-elm-flea-weevil>

Larch casebearer (minor)

Larch casebearer (*Coleophora laricella*) was found by our scouts last week. The larvae hollow out needles, causing them to first wilt and then bleach to a light off-yellow color. The needles will soon turn reddish-brown and drop prematurely within a few weeks.

The caterpillars of this species are very small and overwinter as larvae within tiny tan-colored cases made of hollowed out needles lined with silk (fig. 5). Larvae emerge and begin feeding in spring as needle growth



Figure 5 Larch casebearer larva

begins. They feed for several weeks, pupate on the twigs, and emerge as adult moths in late May and early June. The adults lay eggs on needles and, in a few weeks, eggs hatch (late June and July) and larvae begin to mine inside the needles. Larvae mine the needles for about two months before making their cases from hollowed-out needles. These cases will be carried around on their backs (like a backpack) for the remainder of their larval period.

Management: Unlike most other conifers, larches can develop a second set of leaves. However, repeated defoliation can weaken trees and make them more susceptible to attack by other insects and pathogens. There are various natural controls, such as weather, predators and parasites, and needle diseases that usually keep populations in check. For severe or repeated infestations, insecticides may be needed.

Good websites:

<http://ag.umass.edu/landscape/fact-sheets/larch-casebearer>

<http://na.fs.fed.us/spfo/pubs/fidls/larch/larch.htm>

Spring is a little late

This spring has been a little different. The weather has been all over the place; snow two weekends this month!; high temperatures ranging from 15 to 77, and those temperatures not gradually rising, but interspersed, with a few warm days in between a few cold ones. The warmth and the growing degree days have been creeping along. That can change pretty quickly. The forecast for the next couple of weeks is for more consistently warm weather, and the growing degree days could begin to add up very quickly. In anticipation of that happening, the next three articles are about some of the common pests we see when we get to 100 growing degree days. By the time the next full issue comes out, the whole Chicago region could be at 100 GDD (some sites already are).

Eastern tent caterpillar (minor to potentially serious, depending on population)

Eastern tent caterpillar (*Malacosoma americanum*) has not been spotted yet, but it is a pest that often starts to show up at GDD 100-200. When they start to emerge, look for small tents beginning to form. The larvae gather at a fork in a tree and build a web or “tent” (fig. 6), but at this point you may need to look carefully to spot it. The caterpillars will ultimately grow to two inches long and are hairy with white stripes down their backs and blue spots between longitudinal yellow lines (fig. 7) (these markings will not be as distinct on the young caterpillars). They leave the web to feed during the day, but return at night. Severe defoliation



Figure 6 Tent of Eastern tent caterpillar

only occurs when populations are high.

Eastern tent caterpillars prefer trees in the rose family, such as wild black cherry, apple and crabapple, plum, and peach, but occasionally will feed on ash, birch, willow, maple, oak, and poplar.

Management: The safest way to control the caterpillar is pruning out the webs. This should be done on cloudy or rainy days or at night when the caterpillars are in the nest and not out feeding.

Good website:

<http://www.mortonarb.org/trees-plants/tree-and-plant-advice/help-pests/tent-or-web-making-caterpillars>



Figure 7 Eastern tent caterpillar

European pine sawfly (minor)

Another pest to expect around GDD 100-200 is the European pine sawfly (*Neodiprion sertifer*). When the larvae come out, they will be very small at first. Look at the ends of branches, as the eggs were laid in last year's needles. If you can't find any larvae, check the needles for unopened eggs. This insect can cause heavy defoliation on red, Scots, mugo, Japanese red, and jack pines. European pine sawflies are interesting to watch. Groups of sawfly larvae rear up their heads simultaneously (fig. 8) when disturbed, making the group appear to be one much larger organism. This is a great defense mechanism. When fully grown, the sawflies will be about $\frac{3}{4}$ - 1 inch long and will have several light and dark green stripes on each side of their bodies. Their heads and the three pairs of legs are black. Their mouths are so small after hatching that they can only eat one side of each needle, and therefore the chewed-on needles look like straw. Eventually as the insects mature, they are able to eat entire needles. The larvae feed for weeks on old conifer needles but are finished feeding before current year's needles emerge. They then drop down into the ground to pupate, emerging in September as adults to mate and lay eggs in the current year's needles.



Figure 8 European pine sawfly larvae

Management: Birds feed on the larvae, and rodents eat the pupae in the soil, but these predators are usually inadequate to control the larvae. Larvae can be removed by hand or washed off with a strong stream of water from the garden hose. They have no hooks on their feet like caterpillars do, so they can't hang on very well. Since European pine sawfly larvae are not caterpillars, *Bacillus thuringiensis* var. *kurstaki* (Btk) does not control them.

Good website:

<http://www.mortonarb.org/trees-plants/tree-and-plant-advice/help-pests/pine-sawflies>

Gypsy moth (serious)

Gypsy moth (*Lymantria dispar*) caterpillars are serious defoliators that feed on over 450 species of trees and shrubs. This is another pest that comes out at GDD 100-200. We have not found them yet this year, but it is wise to be scouting and catch them early as Gypsy moth populations have been rising in the last couple of years. Note that very young (early instar) caterpillars will not look the same as older caterpillars (fig. 9). As the caterpillars mature they will develop 5 pairs of blue bumps, followed by 6 pairs of red bumps. Their favorite trees are oak, crabapple, birch, linden, willow, and hawthorn. Although deciduous trees that are defoliated can put out a new set of leaves, the trees use a lot of resources to do so. Trees that suffer a lot of defoliation (greater than 50%) several years in a row may die. Severe defoliation also makes trees more susceptible to other problems. Needle-bearing conifers, including spruces and pines, cannot re-foliate and therefore may die after one season of attack.



Figure 9 Early instar gypsy moth caterpillar

Once active, the caterpillars will be actively feeding for a few weeks. They pupate around the end of June, generally emerging as adults in mid-July through mid-August. The adults will mate and lay eggs, then die.



Figure 10 Mature gypsy moth caterpillar

Management: *Bacillus thuringiensis* var. *kurstaki* (*Btk*) can control young larvae but is not as effective against mature larvae. Treat while larvae are still relatively small. The first three instars remain in the tops of trees, so detection may be difficult. Mature larvae (fourth instar and later) feed at night and crawl down from tree tops to hide during the day in protected spots.

Good websites:

<http://www.mortonarb.org/trees-plants/tree-and-plant-advice/help-pests/gypsy-moth>

Pest Updates: Diseases

Boxwood browning (potentially serious)

We are seeing a lot of browning on boxwood right now. There are a few possibilities here. It could be winter damage, it could be a disease called volutella blight (fungal disease), it could be stem cankers or a combination of any of these problems.

We are getting reports of plants that came out of winter green, and then browned or yellowed in the last 2 to 3 weeks. This would lead us away from winter damage which should have been apparent coming out of winter.

We have not confirmed any cases of *Volutella* (*Volutella buxi*) on boxwood, but you should be examining plants for symptoms. If volutella is present, the undersides of the leaves will show patches of fungal spores that might be white or orangish in color. Volutella can cause stem cankers. Fungicides are not very effective for this problem. Removal of infected tissue and regular watering to maintain health are best. Cut out affected branches and clean tools between each cut. Avoid excess fertilizer. It may make the problem worse.



Figure 11 A partially healed canker showing a roll of callus along the edge.

There are other diseases that can cause cankers, and canker diseases have been prevalent in recent years, due to so much environmental stress. If stem cankers are present, they cut off the water supply and leaves turn tan, but they may be clean (no fungal spores). The stems will be cracked (fig. 11) or sunken where the cankers are present. Bark may even be peeling (fig. 12). Of the shrubs I have personally examined, most have had cankers low on the stem, near the ground. Cut out affected branches and clean tools between each cut. Fungicides will not help. Regular watering will be useful here as well. Avoid excess fertilizer.



Figure 12 Canker with cracked and peeling bark

If the problems listed above are not seen, then this may be just winter kill. Boxwoods should put on new growth in mid-May and we may want to see where the new growth comes in before doing any pruning.

Here is a link to an excellent summary of boxwood problems, complete with photographs: <http://ccesuffolk.org/resources/photographic-guide-of-boxwood-pests-diseases-on-long-island> It was written for the East coast, but contains a great deal of useful information that can be used in our area.

At this time, we are NOT seeing any symptoms that indicate boxwood blight. That disease is not established in Illinois at this time, and so, new plants coming in from out of state would be the source of that disease, not established plantings. Symptoms for boxwood blight can be seen at this link:

https://portal.ct.gov/lib/caes/documents/special_features/boxwood_blight/boxwood_blight_identification_guide_11_x_17_final_300_dpi.jpg

Some symptoms may look similar to other problems, so do not jump to conclusions. If you have concern that you may actually have a case of boxwood blight, contact the University of Illinois Plant Clinic at 217-333-0519 or plantclinic@illinois.edu. Boxwood blight is a regulated pathogen in Illinois and the U of I Plant Clinic is the state lab that handles diagnosis of this problem.

Cedar apple rust (potentially serious, but not life-threatening)

Last week, our scouts found galls of cedar-apple rust on junipers. These galls had expanded their spore horns about 1/8 inch (similar to those seen in fig. 13). The rain this week could cause those horns to expand quickly, especially if the temperatures also warm. Cedar rust really does not harm the juniper host. We want to think about protecting the deciduous hosts (like crabapple and hawthorn). We want to be treating before the spores come in contact with the deciduous host's leaves, so treatment time should begin around the time when crabapple flower buds start to show color.



Figure 13 Telial horns beginning to expand on gall

Phomopsis tip blight (minor to potentially serious)

Phomopsis tip blight is a leaf and shoot infection that affects the new, young foliage of various evergreens. It is fairly common on certain junipers, but our scouts also recently found it on

arborvitae. The first symptom, yellow spots on young needles, occurs soon after infection. The fungus then enters young stem tissue causing dieback of the new shoot tips (fig. 14). Affected foliage turns dull red to brown and then ash gray. As the disease progresses, small lesions (cankers) form on the stems where infected and healthy tissue meet. Infection is spread primarily by splashing rain, wind, insects, or mechanical means. Repeated infections occur when temperatures are between 70 -80 degrees F, during periods of high humidity, and when foliage is wet. The fungus can persist in dead parts of infected plants for as long as two years.



Figure 14 Dieback due to Phomopsis

Severity of the disease is often tied to the age of the plant. Young plants may be seriously injured or even killed, while older plants are less severely injured. Repeated infections, year after year, may lead to decline.

Management: Cultural techniques, such as avoiding wetting of foliage, proper spacing of trees for good air circulation and sanitation (removal of dead tissue when feasible) will help reduce the incidence of disease. Small trees may need to be treated with fungicides in spring to protect them from damage.

Good websites: <http://www.mortonarb.org/trees-plants/tree-and-plant-advice/help-diseases/juniper-tip-blight>
<http://plantclinic.cornell.edu/factsheets/junipertipblight.pdf>

Pest Updates: Weeds

Bishop's weed (aggressive)

For many years, Bishop's weed (*Aegopodium podagraria*) was sold as a ground cover and some garden centers still sell it. The variegated cultivar (fig. 15) was especially popular. But times change and the biggest question that the Plant Clinic gets regarding this plant is "How do I get rid of this?" Why the change? Bishop's weed is a strong grower and is very aggressive, often covering a lot more territory than is desirable. This plant



Figure 15 Variegated Bishop's weed

spreads easily underground and can be difficult to control.

The leaves are compound with up to 9 leaflets. The arrangement of the leaves often leads people to mistake it for poison ivy. Leaves of the species are green, but the variegated cultivar has green leaves with creamy margins. The plants will produce clusters of white flowers that resemble Queen Anne's lace, followed by lots of seeds!

Management: Bishop's weed can be difficult to control. Remove flowers before they go to seed to minimize spread through that venue. Control of existing plants is difficult without herbicides because digging the plant seldom removes all the underground stolons. Glyphosate can be used to control this plant, but multiple applications may be needed. It is best to treat the plant when it is small, either at the time it is emerging from the soil or resprouting after being cut down. Glyphosate will be absorbed by the young leaves and transported down to the root system to kill out the entire plant. Glyphosate is a non-selective herbicide and can kill or damage any plant so care must be used to avoid getting it on desirable plants.

Miscellaneous

Wise use of pesticides

We get a lot of questions about pesticide use, especially in regard to safety (for humans, pets and bees). "Safe" is a difficult word to use when talking about pesticides (insecticides, fungicides, herbicides). With any chemical, whether it is a pesticide or a household cleaner, there is always some risk. If a pesticide is known to be toxic to bees, fish or birds, EPA mandates that information be noted on the product label in a section called "Environmental Hazards". There is ongoing research, however, that is indicating that some pesticides might not be toxic to bees, but may be detrimental to them in some way (see links below for research).

Many people are concerned about pesticides and cancer for both humans and pets. Many of these questions don't yet have an answer. Again, there is a lot of ongoing research about this topic. The purpose of this article is not to offer answers, but to remind people to be careful when using these products. Here are some tips to consider:

- If you are not comfortable using pesticides, don't use them.
- Evaluate the pest or disease. Is it serious enough to warrant treatment? Many problems are more cosmetic than harmful and don't really need treatment at all.
- Look for alternatives to pesticides. There are often non-chemical measures that can be used to minimize pests. These include pruning out affected parts, proper watering and fertilizing, and using traps or barriers. If you go this route, you will need to be able to live with a few weeds/pests.

- Always have a pest properly identified so that if you chose to use a pesticide, you can select the right one for the purpose.
- Use the pesticide at the right time so it is as effective as possible.
- Don't use more than the label calls for. More is not better.
- Limit exposure for yourself, your family and pets.
- Don't spray pesticides on plants that are in flower as this is when pollinators will be visiting and this may put them at risk.

Websites about pesticides and bees:

<https://pollinators.msu.edu/resources/growers/fungicidesafety/fungicides-during-bloom/>

<https://gpnmag.com/article/what-about-the-effect-of-fungicides-on-bees/>

<https://pollinator.cals.cornell.edu/threats-wild-and-managed-bees/pesticides/fungicides/>

<https://www.ars.usda.gov/news-events/news/research-news/2013/bees-exposed-to-fungicide-more-vulnerable-to-nosema-parasite/>

<http://news.psu.edu/story/301619/2014/01/27/research/common-crop-pesticides-kill-honeybee-larvae-hive>

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0077547>



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The Plant Health Care Report is prepared by Sharon Yiesla, M.S., Plant Knowledge Specialist and edited by Fredric Miller, Ph.D., Research Entomologist at The Morton Arboretum and Professor at Joliet Junior College; Julie Janoski, Plant Clinic Manager, 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 to the volunteers who will be scouting for us this season. The Scouting Volunteers include: Maggie Burnitz, LeeAnn Cospers, Ingrid Giles, Loraine Miranda, Mary Noe and Emma Visee. Your hard work is appreciated. Thanks also to Donna Danielson who shares her scouting findings.

Literature/website recommendations:

Indicator plants are chosen because of work done by Donald A. Orton, published in the book Coincide, The Orton System of Pest and Disease Management (<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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