

# Plant Health Care Report

Scouting Report of The Morton Arboretum



THE  
CHAMPION  
of TREES

June 23, 2023

Issue 2023.7

For comments regarding PHCR, or to subscribe to email alerts regarding posting of new issues, contact me at [syiesla@mortonarb.org](mailto:syiesla@mortonarb.org). Our report includes up-to-date disease and insect pest reports for northeastern Illinois. Contact us via email at [plantclinic@mortonarb.org](mailto:plantclinic@mortonarb.org) or by phone at 630-719-2424 (Monday thru Friday, 10 am to 4pm). The Plant Clinic is also open to walk-ins, but a [timed entry](#) and payment of entry fee is required for non-members.

## Quick View

### What indicator plant is in bloom at the Arboretum?

Catalpa (*Catalpa* species) is in full flower (fig. 1)

**Accumulated Growing Degree Days (Base 50) at The Morton Arboretum: 769 (as of June 22).**

### Insects/other pests

- Japanese beetles and white grubs
- Bagworm
- Two-lined chestnut borer
- Viburnum leaf beetle update

### Diseases

- Where are all the diseases?
- Mushrooms on trees

### Miscellaneous

- Blossom-end rot on tomato
- Dieback, cankers, stress and weather



Figure 1 Catalpa (photo: John Hagstrom)

## Soil temperatures around Illinois (from Illinois State Water Survey)

This information will be provided all season. For data from other reporting stations, go to <https://warm.isws.illinois.edu/warm/soil/> (you will need to set up an account to access data.)

Max. Soil temps For 6/22/2023*	St. Charles reporting station (north)	Champaign reporting station (central)	Carbondale reporting station (south)
2-inch, bare soil	90.7	101.2	90.1
4-inch, bare soil	89.4	90.3	85.3
4-inch, under sod	82.6	86.5	80.1
8-inch, under sod	74.4	79.6	76.7

\* This is the maximum soil temperature recorded the day prior to publication of PHCR.

## Degree Days (current and compared to past years) and rainfall

As of June 22, we have 769 base-50 growing degree days (GDD) at The Morton Arboretum. The historical average (1937-2022) for this date is 789 GDD<sub>50</sub>. The table below shows a comparison of GDD in different years. We are comparing the GDD<sub>50</sub> reported in this issue with the GDD reported in the first issue of 2022, 2017 and 2016. These years were selected since publication dates of the first issue were within a day or two of each other. Glencoe, and Waukegan (60085) were not used in 2017 and 2016, so there is 'no report' from those stations.

Location	GDD as of 6/22/2023	GDD as of 6/23/2022	GDD as of 6/22/2017	GDD as of 6/26/2016
Carbondale, IL*	1389	1543	1643	1677
Champaign, IL*	1143	1234	1325	1388
Chicago Botanic Garden**	No report	928	826 (6/21)	775 (6/22)
Glencoe*	417	599	No report	No report
Chicago O'Hare*	964	1054	996	1156
Kankakee, IL*	973	1051	1112	1197
Lisle, IL*	985	1072	1032	1185
The Morton Arboretum	769	985.5	867.5	980
Quincy, IL*	1214	1298	1402	1527
Rockford, IL*	904	924	917	1019
Springfield, IL*	1169	1270	1369	1467
Waukegan, IL* (60087)	771	870	783	959
Waukegan, IL (60085)	844	939	No report	No report

\*\*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 <https://gddtracker.msu.edu/>

## Seasonal precipitation

Seasonal precipitation (rain and melted snow) in inches.			
	2023	2022	Historical average (1937-2022)
Jan	2.85	1	1.935
Feb	4.88	2.61	1.775
Mar	2.29	3.88	2.536
April	2.23	3.88	3.667
May	.79	6.1	4.206
June	.41 (thru 6/22)		
July			
Aug			
Sept			
Year to date	13.45 (thru 6/22)	17.47 (thru May)	14.12 (thru May)

### How serious is it?

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”. “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

Examples of insects that may emerge soon in northern Illinois (based on growing degree days)			
GDD (base 50)	insect	Life stage present at this GDD	Type of damage
700-800	<a href="#">Bagworm</a>	Caterpillars emerging	Chewing foliage
900-1200	Japanese beetle	adults	Chewing foliage; mating and laying eggs
1200-1800	Fall webworm	Caterpillars feeding, but webbing not seen yet	Chewing on leaves

### Japanese beetles and white grubs (Potentially serious)

That special time of year has arrived. It’s Japanese beetle (*Popillia japonica*) time. We have not had any reports of adult beetles out yet, but in the last few years they have been showing up around the third week of June and a couple of years ago, we had reports as early as June 16. It is hard to say how this year’s early drought might impact their emergence. We know they are coming, so we might as well discuss them now.

Japanese beetles are up to 1/2 inch long, and have oval, metallic green bodies with coppery brown wing covers (fig. 2). They have five white spots along each side and two additional white spots behind their wing covers. Upon examination under a hand lens, the spots are actually tufts of hair.



Figure 2 Adult Japanese beetle

Adult beetles feed on about 300 different species of ornamental plants with about 50 species being preferred. Highly preferred hosts include rose, crabapple, cherry, grape, and linden. In recent years, we have also found them feeding on basil and canna. The adults feed on leaf tissue between veins, resulting in skeletonized leaves (fig. 3). Severely infested plants may be almost completely defoliated. Early infestations of Japanese beetle may be missed since the insects often start feeding in the tops of trees.

Japanese beetles overwinter as larvae (grubs) about four to eight inches beneath the soil surface. In spring, as the soil temperatures warm to about 55° F, the grubs move upward through the soil to pupate. Adults normally emerge from late June through July. Within a few days after emergence, the adults mate and the females burrow into the soil to lay eggs. Nearly all eggs are laid by mid-August. In sufficiently warm and moist soil, eggs will hatch in about ten days. This year's drought may make egg-laying difficult, but lawns that are being watered regularly could become a prime target for egg-laying. Grubs feed on plant roots until cold weather forces them to greater depths in the soil for the winter. There is one generation of this beetle per year.



Figure 3 Japanese beetle damage

Japanese beetles are harmful as adults, but also in the larval or grub stage. Even if you do not see Japanese beetles in your yard, your lawn could still have grubs. Other species of beetles also have grubs as their larval stage. How do you know if your lawn needs grub control? Grubs eat grass roots, and this will lead to brown areas in the lawn. Unfortunately, other causes can lead to a brown lawn. Most lawns are brown right now

due to lack of rainfall. If your lawn has grubs, you will be able to pull the lawn up like a carpet since the roots are gone.

Is grub control a good idea for everyone? Not necessarily. If your lawn has never had grubs before and you are not irrigating, it would be best to skip the grub control. Usually control is not warranted unless 10-12 grubs are present per square foot.

**Management:** Adult Japanese beetles can be handpicked. It is easiest to catch them by placing a soapy-water filled container directly under the leaf that they are chewing on and then shaking the leaf. The soapy water ensures that the beetles die while you're collecting them. The beetles generally drop straight down into the collecting container. Sometimes Japanese beetle pheromone traps are used to trap them. We don't recommend these, as they will attract even more beetles to your property (more than the trap can collect). Insecticides can be used in the case of valuable plants, but even insecticides do not guarantee control. A soil drench of systemic insecticide in spring is sometimes recommended for control of Japanese beetles. **It should be noted that imidacloprid, chlothianidin and dinotefuran labels indicate that these products can no longer be used on lindens (*Tilia* species). That means it is illegal to use it on those trees. Some other systemic products have the same labeling. Be sure to check the label of any systemic product concerning its use on lindens.**

Managing the Japanese beetle grubs that will hatch out around late July may help to reduce populations of adult beetles for next year. Eggs and first instar larvae require moisture to survive; therefore, the easiest way to reduce grub populations is to limit lawn irrigation during the egg-laying period when beetle populations peak (mid-July through early August). Japanese beetles also avoid laying eggs in shade, which is another great reason to plant more trees and shrubs. Insecticide applications are effective in controlling young grubs.

If you plan to manage the grub stage with insecticides, know that the timing of application depends on the product selected. There are now many insecticides available to treat grubs, and they have different application times. Traditional grub control insecticides are applied to the lawn when young grubs are active (August and September). Other products may be applied in mid-summer or even late spring, but are still targeted at new grubs. The bottom line is to read the product label carefully and use it at the appropriate time. The information given here is very general. The product label will give specific information.

Biological insecticides that contain *Bacillus thuringiensis* var. *galleriae* are targeted toward beetles and their grubs. Other grub control insecticides are broad spectrum and may kill other insects besides beetles.

We receive a lot of questions about the use of the biological control milky spore disease. This is a bacterium that is specifically toxic to the grub stage of the Japanese beetle and is applied to the soil. This is a slow method at best in the warmer southern states (may take 3-5 years to build up in soil enough to be effective) and is often not very effective at all in colder, northern states. Also, if you have grubs that come from another type of beetle, it won't work on them at all. The product is specific to the grubs of Japanese beetles. This product is really not recommended for our area.

Beneficial nematodes can be watered into turf, again in late July, where they infest and kill grubs. Products containing *Heterorhabditis bacteriophora* nematodes are recommended by the University of Illinois. Beneficial nematodes are not always available in stores; they are available through mail order/internet sources.

Good websites:

<https://mortonarb.org/plant-and-protect/tree-plant-care/plant-care-resources/japanese-beetles/>

[https://www.canr.msu.edu/news/how\\_to\\_choose\\_and\\_when\\_to\\_apply\\_grub\\_control\\_products\\_for\\_your\\_lawn](https://www.canr.msu.edu/news/how_to_choose_and_when_to_apply_grub_control_products_for_your_lawn)

### **Bagworm (potentially serious)**

We are watching for bagworm (*Thyridopteryx ephemeraeformis*), but so far, have confirmed reports. This insect may be emerging right now, but it can be overlooked because, at this point, it would be very, very small. We need to catch them in the early stage of life, if insecticides are to be used. Now is the time to be scouting. In 2021, we did have some reports of heavy populations of bagworm devastating arborvitae. This pest is often on evergreen trees and shrubs, but does not feed on them exclusively. They are also known to attack a variety of deciduous trees.

Bagworms overwinter as eggs inside the female bag (fig. 4). The bag can contain between 300 and 1,000 eggs. The eggs hatch in early summer, and the young larvae suspend from a silk string and are often "ballooned" by wind to nearby plants. When a suitable host plant is found, larvae begin to



Figure 4 Bagworm bag

form bags over their bodies. The tiny cone-shaped bags are constructed from silk and camouflaged with bits of twigs and foliage from the host plant. Larvae stick their heads and front legs out of the top of the bags to feed and move (fig. 5). The feeding by young larvae results in holes in the foliage of deciduous plants and loss of needles on evergreens. As the larvae grow, they enlarge their bags and feed on the entire leaf, leaving only veins. They move

to a sturdy branch, attach the bag with a strong band of silk, and then pupate. By August the larvae have matured and are 1 to 1-1/2 inches in length, and their completed bags are 1-1/2 to 2-1/2 inches long. About four weeks later, adult males emerge and mate with the sedentary females. The female, which has no eyes, wings, legs, antennae, or functional mouthparts, lays eggs and is then mummified around the egg mass within the bag.



Figure 5 Bagworm larvae peeking out of the bag

Bagworm populations can build rapidly and quickly defoliate their hosts. Healthy deciduous trees can usually tolerate consecutive years of severe defoliation before they are killed. Evergreen trees, on the other hand, can be killed by just one year of severe defoliation. Bagworm larvae feed on over 120 species of trees and shrubs. Their bags are made of the foliage they're feeding on, so a bagworm feeding on pine will have pine needles in its bag, while a bagworm feeding on an oak tree will have pieces of oak leaves decorating its bag.

**Management:** We are in the early stage of development and insecticides may be very effective at this time. Once the larvae stop moving around and attach the bag to the stem, they are safe from insecticides. Handpicking bags from that time until early spring will help control populations for next year. If they can't hatch, they can't feed, so this is more effective than people think. Remove as many of the bags as possible later in the season.

Good websites:

<https://mortonarb.org/plant-and-protect/tree-plant-care/plant-care-resources/bagworms/#overview>

### Two-lined chestnut borer

We are getting a number of reports of two-lined chestnut borer (*Agrilus bilineatus*). This is not a new pest for our area, but it is worth discussing. In the title of this article, I did not rate this pest in terms of severity. Here's why. This borer attacks weakened oaks. This is a key point to understand. This borer is not usually the primary cause of decline of an oak. Unlike the emerald ash borer, this is NOT an aggressive pest targeting healthy trees. It is an opportunistic pest that takes advantage of an oak that is already under stress from some other problem or problems. On healthy oaks, the borer's activity is usually restricted to branches that died from some other cause.

Why is this worth noting? If we treat for the borer and do nothing else, we really have not solved the problem. We need to look to see if there is another insect or disease affecting the tree. We need to know if the tree has been affected by storm damage or nearby construction. We also need to consider the weather. For the last ten years or so, our weather has been less than good (several droughts, flooding spring rains, a couple of harsh winters, widely fluctuating temperatures). In short, we need to identify other stressors and see if we can do anything to mitigate them.

Larvae of this native borer feed in the tissues under the bark, like many other borers do, making galleries in the tissue. The larvae overwinter under the bark. They pupate in spring and begin to emerge as adults in late May. The emergence hole of the adult is similar to that of other borers in the genus *Agilus* (bronze birch borer and emerald ash borer). It is shaped like a capital 'D' and is about the size of half a pencil eraser. The adults mate and lay eggs over the next few weeks. The eggs hatch, and the new larvae enter the bark to feed.

**Management:** Treating this borer with systemic insecticides can be useful, if the decline of the tree has not gone beyond 40% loss of the canopy. As noted above, this is only part of the solution. New oaks need to be planted and cared for properly. This means planting at the right depth, using best practices, such as regular watering, mulching and pruning out dead limbs (in the dormant season only). All oaks should be protected from compaction and construction damage. Fertilizer should be considered carefully. It is a source of nutrients, not a magic elixir to fix all problems. Young trees that are putting on a lot of growth may need to be fertilized annually. Older, established trees may need it less frequently (maybe every 3 to 5 years). Trees under stress may not need it at all. Fertilizer applied to dry or damaged roots may do more damage. Fertilizer can push growth in a tree and lead to increased water needs. In a drought, this may also add stress.

Good websites: <https://extension.umn.edu/tree-and-shrub-insects/metallic-wood-boring-beetles>  
[https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5350723.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5350723.pdf)

### **Viburnum leaf beetle update (serious)**

The viburnum leaf beetle larvae are going underground and getting ready to pupate. At this point, we can do nothing to manage them. The adults should emerge in early July. The beetles are small (1/3 inch) and brown to golden brown (fig. 6). They are not easily noticed, but their feeding is. They will pick up where the larvae left off.



Figure 6 Viburnum leaf beetle

**Management:** Adults can be treated with a variety of insecticides. Insecticidal soap is **not** effective on the adults.



They have hard bodies and insecticidal soap works primarily on soft bodied insects. Do not spray for the adults until they are present. Insecticides are not preventative.

## **Pest Updates: Diseases**

### **Where are all the diseases?**

If you are wondering about the lack of diseases covered this year in the PHCR, here's what may have happened to limit disease development. The weather was extremely erratic in spring when new foliage was emerging (and was susceptible to infection). Temperatures went from way too hot to unseasonable cold on a regular basis through most of April and May. Rainfall was above average in February and March, then dropped to average or below in April. May produced less than an inch of rain at the Arboretum. Fungal diseases need the right temperature and the right amount of rainfall at the same time. It looks like that did not happen very often.

This does not mean a disease-free year. We are seeing canker diseases running rampant. These diseases do best when trees and other plants are under stress or wounded. That is happening all the time, due to the stressful weather of the last ten to twelve years.

Powdery mildew on ninebark is worse than it has been for years. This disease does not need water covering the leaves. It is favored by warm days followed by cool nights. Much of early May gave us exactly those conditions.

Root rots are happening on many trees, but they may not have started this year. We have had a few wet springs in a row and the rots may have started then.

For now, we may be looking at a year with fewer diseases. It seems like the insects, however, are making up for that by showing up in droves. Never a dull moment in the landscape.

### **Mushrooms on trees (serious)**

Mushrooms can be interesting to look at, and some are even very pretty. We need to remember, however, that the fungal organisms that cause wood decay in trees eventually produce mushrooms. These fungal organisms may enter a tree through a wound or through a crack in the bark that allows water to enter. The mushrooms produced by these decay organisms can take on a lot of different appearances. Sometimes it will be a group of mushrooms growing at the base of the trunk or out of the root system. We may see a typical-looking mushroom growing out of the trunk of the tree (fig. 7) or a shelf-like structure referred to as a shelf fungus. These all tend to look fairly minor, but we should pay close attention.

Any mushroom-like structure growing out of a tree is a sign that there is decay inside the tree. We often refer to this under the general term 'wood rot'. The mushroom growing out of the

trunk or stems is the tip of the ice berg. With wood rot, there is a fungal organism inside the wood causing it to decay. This decay process may continue, undetected, for years. At some point, in the life cycle of the fungal organism causing the decay, the reproductive structure (the mushroom) is produced and can be seen on the outside of the tree.



Figure 7 Mushrooms growing out of a tree trunk (photo: S. Yiesla)

Even though these appear minor, and many people just knock them off when they see them, we really should pay attention to this sign and call in a professional, certified arborist to examine the tree. When the wood inside a tree decays, that tree starts to lose stability. It may be one branch that is rotting and we can easily remedy that by removing that branch. If the rot is inside the main trunk, the whole tree may need to be removed. Any fungal structure growing on a tree should be taken seriously. Trees with rot inside may still leaf out fully and look great. The wood rot is often in the heartwood of the tree. Water is moved up through the sapwood, and when that wood is undamaged, the tree gets the water it needs and will still leaf out even if the core is rotting. To find a certified arborist, go to [illinoisarborist.org](http://illinoisarborist.org) or [treesaregood.org](http://treesaregood.org).

## Miscellaneous

### **Blossom-end rot**

You planted and tended your tomato plants. You are rewarded with flowers. The pollinators visit your flowers and before you know it there are tiny tomatoes forming. Then one day, you discover that the bottom of the tomato is turning black and sometimes almost leathery (fig. 8). This is blossom-end rot. The bottom of the tomato is called the blossom end, because that is where the flower or blossom was connected. That little dark dot on the bottom of the tomato marks the spot where the flower was.

This type of 'rot' is not a disease. It is caused by a calcium deficiency. Calcium is an important building block of the cell walls within every plant. When it is deficient, the cell walls don't form properly and the cells collapse. Blossom-end rot does not always mean that there is not enough calcium in the soil. It means that the calcium is not making it all the way to the bottom of your tomato. Our soils are generally not deficient in calcium.

Improper watering or very dry weather are often the reasons we don't get the calcium out to the bottom of the tomatoes. The water carries the calcium from the soil into the plant. If water is lacking, the calcium can't be delivered. Even though we had a lot of rain early in the year, that supply has dried up, and now it is up to us to give our plants what they need in terms of water. Often, gardeners are watering frequently, but not deeply. Watering every day is not needed for in-ground gardens. Water those plants when the top inch or so of soil is drying, and when you water be sure to water thoroughly. If you have to water every day or every other day, you are not watering thoroughly. Depending on weather, you should be watering every 4 to 7 days.



Figure 8 Blossom end rot damage. (Photo: Larry Williams, Okaloosa County Extension)

Container-grown tomatoes are the exception. They most likely will need to be watered every day due to the small volume of the container. Water containers enough so that some water comes out the drainage holes in the bottom of the container. Container-grown tomatoes often get blossom-end rot because it can be difficult to maintain adequate water in containers. Also, unlike our garden soils, potting mixes for containers may need to have calcium added.

Blossom-end rot is not only seen on tomatoes. It can be on other vegetables as well, including peppers and watermelons.

### **Dieback, cankers, stress and the weather**

That title has a lot going on, and those things often go hand in hand. One of the most popular questions in Plant Clinic is "Why is my (name of plant) leafing out slowly/having dead twigs/turning yellow"? Everyone expects the problem to be a disease or insect, but these days it is often a combination of weather-related events that cause stress. This stress can make plants more susceptible to canker diseases, and those cankers lead to dieback of branches. We have had stressful weather years since at least 2012. That year gave us early and extreme heat, coupled with a drought (which most likely led to some root damage). The next two years gave us extremely wet springs and flooded soils in many areas (more root damage). We have also had two polar vortices since then. We again had really wet springs in 2019 and 2020. Then 2021 gave us a dry spring and a dry summer. In recent years, we have had up-and-down springs, where the temperature was 80 degrees one week, and near freezing levels the next week. With 10-12 years of stressful weather extremes, it is no wonder that some plants are struggling.

Many trees and shrubs have cankered stems. Canker disease organisms are usually not very aggressive in healthy trees. They generally need an entryway, such as wounds, to infect the host. When trees are under the kind of stress we have been seeing for the last several years, the disease organism can get in to stressed trees through natural openings. The canker disease organism grows under the bark and destroys the tissue that moves water through the plants, cutting off the water supply. Cankered stems may have broken or peeling bark, sunken areas or discolored bark. These stems need to be cut out. Disinfect pruning tools between cuts to minimize spread of these diseases.

We can't control the weather, but we can give our trees and shrubs good care to help mitigate some of the effects of the weather. It is always a good idea to prune out dead wood and cankered branches. We do not recommend fertilizing these stressed plants. If the roots are compromised and not taking up water from the soil, they won't be able to take up nutrients either. Chemically, fertilizers are considered salts and may further damage stressed roots. Water is the best remedy for injured roots. We need to supply enough water to allow new roots to grow, but must be careful not to saturate the soil. Roots need water, but they also need air.

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## Presenting Sponsor of the Plant Clinic



The Plant Health Care Report is prepared by Sharon Yiesla, M.S., Plant Knowledge Specialist and edited by Stephanie Adams, Ph.D., Plant Health Care Leader; Fredric Miller, Ph.D., Research Entomologist at The Morton Arboretum; 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 all the staff and volunteers that report disease and pest problems when they find them. Your hard work is appreciated. Our volunteer scouts for 2023 are Deb Link, Maureen Livingston, Loraine Miranda, and Molly Neustadt.

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.](#)

Additional information on growing degree days can be found at:

[http://www.ipm.msu.edu/agriculture/christmas\\_trees/gdd\\_of\\_landscape\\_insects](http://www.ipm.msu.edu/agriculture/christmas_trees/gdd_of_landscape_insects)  
[http://extension.unh.edu/resources/files/Resource000986\\_Rep2328.pdf](http://extension.unh.edu/resources/files/Resource000986_Rep2328.pdf)

This report is available as a PDF at The Morton Arboretum website at <https://mortonarb.org/about-arboretum/plant-health-care-report/>

For pest and disease questions, please contact the Plant Clinic. You can contact the Plant Clinic via email at [plantclinic@mortonarb.org](mailto:plantclinic@mortonarb.org). Emails will be answered during business hours Monday through Friday. You can call the Plant Clinic by phone (630-719-2424) or visit in person, Monday thru Friday 10 am to 4 pm. On weekends and national holidays, Arboretum members need [a timed entry ticket](#) to enter the Arboretum and visit Plant Clinic in person. Non-members need [a timed ticket](#) every day and must pay the entry fee.

Inquiries or comments about the PHCR should be directed to Sharon Yiesla at [syiesla@mortonarb.org](mailto:syiesla@mortonarb.org).

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## 2023 Plant Health Care Report Index



THE  
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