Plant Health Care Report

Scouting Report of The Morton Arboretum

June 25, 2010 **Issue 2010.11**

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.

What indicator plant is in bloom at The Arboretum?
Bottlebrush buckeye (*Aesculus parviflora*) (Figure 1)

Accumulated Growing Degree Days (Base 50): 968
Accumulated Growing Degree Days (Base 30): 2910

Quick View

Weekly reminder
What to look for in the next week

This week's sightings:

Insects
- Rose curculio
- Japanese beetle
- Gypsy moth update
- Hedgehog gall

Diseases
- Thyronectria Canker
- Rose rust
- Guignardia leaf blotch
- Diplodia Tip Blight
- Brown rot of stone fruit-update

Physiological
Remontant flowers

Woody of the week: Nikko Maple (*Acer maximowiczianum* formerly *A. nikoense*

Fungus of the week: Coral fungi (Family Clavariaceae)

Figure 1 Bottlebrush buckeye (*Aesculus parviflora*)

Degree Days and Weather Information

As of June 23, 2010, we are at 968 base-50 growing degree days (GDD), which is approximately 2 calendar days (55 GDD) ahead of 2009 at this time, and ahead of the historical average (1937-2009) by 235 GDD (ten calendar days). In the past week it has rained 6.5 cm (2.56 in), 16.61 cm (6.54 in) precipitation in June, and 42.24 cm (16.63 in) for the year.

Location	Growing Degree Days through June 23	Precipitation (in) Between June 17 – 23
Aurora, IL**	1036.1	
Cahokia, IL**	1526.3	
Carbondale, IL **	1628.8	
Champaign, IL**	1316.3	
Chicago Botanic Garden (Glencoe, IL)*	960	1.87
Chicago Midway	1111.9	
Chicago O'Hare*	1029	1.09
Decatur, IL**	1369.5	
DuPage County Airport (West Chicago, IL)**	1025.4	
Lawrenceville, IL**	1631.0	
Mattoon, IL**	1392.0	
Moline, IL**	1223.4	
The Morton Arboretum (Lisle, IL)	968	6.54
Peoria, IL**	1294.1	
Quincy, IL**	1323.3	
Rockford, IL**	1025.5	
Springfield, IL**	1433.3	
Sterling, IL**	820.1	
Waukegan, IL**	820.1	
Wheeling, IL**	950.9	

*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:

Everyday more trees are becoming infested with emerald ash borer. If you have ash trees you want to save, prevention is the key to this insect problem. There are several chemical preventative measures available, but most need to be applied by someone with an Illinois pesticide applicator license. If your trees are not showing symptoms of an infestation (dying branches, woodpecker activity), there's still time to have your trees treated. Contact a reputable ISA Certified Arborist to come look at your trees and they'll help you determine what's best for your trees.

What to look for in the next week:

Island chlorosis, sooty mold, rust on goldenrod, rust on bee balm, measles on peony, apple and thorn skeletonizer, mossy rose, leaf blotch of American linden (Asteroma), yellow bear caterpillar

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: Loraine Miranda, Ann Klingele, LeeAnn Cosper and Fritz Porter. Your hard work is appreciated.

This Week's Sightings…

Rose curculio

Figure 2 Rose curculio (*Merhynchites* (=*Rhynchites*) *bicolor*)

Rose curculios (*Merhynchites* (=*Rhynchites*) *bicolor*) (Figure 2) were found on Frau Dagmar Hastrup rose (*Rosa rugosa* 'Frau Dagmar Hastrup') on our grounds this week. This is a red weevil with a black snout, head, and legs. The snout is ideal for drilling small holes into flower buds and hips for feeding and egg laying. The curculio is about 0.16 cm (0.25 in) long. Damaged flower buds that bloom will appear ragged and unsightly. Larvae that feed within rosebuds sometimes kill them.

Control: Adults can be handpicked. Like Japanese beetles, adults fall from the plant when they are disturbed. You may be able to catch many of the insects by shaking rose canes over a bucket. Remove spent flowers to eliminate larvae.

Suggested reading: http://oregonstate.edu/dept/nurspest/rose_curculio_weevil.htm

Japanese beetle

We have found the first Japanese beetle (*Popillia japonica*) (Figure 3) adults of the season. Japanese beetles are up to 1.27 cm (0.5 in) long, and have oval, metallic green bodies with coppery brown wing covers. They appear to 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 white hair.

Figure 3 Japanese beetle (*Popillia japonica*)

Adult beetles feed on nearly 400 different species of ornamental plants with about 50 species being preferred. Highly preferred hosts include rose, crabapple, Norway maple, apple, cherry, grape, and linden. The adults feed on leaf tissue between veins, resulting in skeletonized leaves that soon wither and die (Figure 4). Severely infested plants may be almost completely defoliated.

Figure 4 Skeletonized leaves due to Japanese beetle feeding

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 (usually mid-April), the grubs move upward and feed on plant roots. Adults emerge in late June through July. Within a few days after emergence they mate and the females burrow into the soil to lay eggs at a depth of two to four inches. Nearly all eggs are laid by mid-August. In sufficiently warm and moist soil, eggs will hatch in about ten days. Larvae feed on plant roots until cold weather forces them to greater depths in the soil for the winter. There is only one generation of this beetle per year.

Adult Japanese beetle control:

Adult Japanese beetles can be handpicked; this is the control we use here at the Arboretum. It is easiest to catch them by placing a container directly under the leaf that they are chewing on and then shaking the leaf. For reasons known only to Japanese beetles, they nearly always fly straight down, right into the collecting container. Be careful that you aren't also collecting bees, which are also found on roses this time of year.

Sometimes pheromone traps are used to collect Japanese beetles. It is a bad idea to use the pheromone traps anywhere that you don't want Japanese beetles, because they attract so many extra beetles.

In severe infestations, insecticides can be used. Foliar applications should be made when adults are most active—mid-July through early August, soil drenches should be done 3-4 weeks before the beetles are found. For information about chemical control, refer to the *Commercial Landscape Turfgrass Pest and Management Handbook 2010* (CPM) if you are a commercial applicator, or the *Home, Yard and Garden Pest Guide* (HYG*) if you are a homeowner.*

When choosing new plants, select resistant species. For a list of susceptible and resistant plants see: http://msucares.com/pubs/publications/p2333.pdf

Larvae (grub) Japanese beetle control:

The underground larvae populations can be found by identifying areas of turfgrass that are dying. Simply peel the turfgrass back and look underneath the sod to assess the population. Treatment for grub infestations in turfgrass is not considered necessary unless the population exceeds 10 to 12 grubs per square foot. Eggs and first instar larvae require moisture to survive; therefore, the easiest way to reduce grub populations is to limit turfgrass 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. But if you insist on growing turfgrass and have a bad grub infestation, insecticide applications are effective in controlling young larvae. To achieve the most effective control, insecticides should be applied when grubs are small and feeding near the soil surface. Insecticide applications in spring are often ineffective since the grubs are quite large or, in late spring, they could be pupating. Refer to the CPM and HYG for specific chemical recommendations.

Although not too effective in colder climates, the most commonly used biological control is a milky spore pathogen (*Bacillus popilliae*). This is a bacterium that is specifically toxic to the grub stage of the Japanese beetle and is applied to the soil. However, if you are using this to kill white grubs in your lawn, the first step is to be positive that the problem is caused by Japanese beetle grubs. In this area, more lawn damage is caused by southern masked chafer grubs (also known as annual white grubs) than by Japanese beetle grubs. There is a simple way to distinguish between the two.

You need to look at the underside of the posterior end of the grubs. Grubs have a pattern of hairs on the last abdominal segment called rasters. You need at least a 10X lens to see the hairs. The rasters on the Japanese beetle grubs are in a distinct inverted "V" shape, while the raster pattern on the southern masked chafer grubs is random. Ohio State University has a really neat web site that shows the different common grubs and their "raster patterns": http://ohioline.osu.edu/hyg-fact/2000/2510.html

Beneficial nematodes are now available that can be watered into turf where they infest and kill grubs. Products containing *Heterorhabditis* spp. appear to be more effective than those containing *Steinernema carpocapsae*. Beneficial nematodes are not available in stores; they are only available through mail order sources. Ohio State University keeps a web site listing good mail order sources of beneficial nematodes at: http://www.oardc.ohio-state.edu/nematodes/nematode_suppliers.htm

Suggested reading: http://www.ag.ohio-state.edu/~ohioline/hyg-fact/2000/2504.html
http://ohioline.osu.edu/hyg-fact/2000/2001.html

Gypsy moth update

First some good news--Gypsy moths have predators, including a fungus called *Entomophaga maimaiga*. *Entomophaga* is not native to this continent, but was brought to this country from Japan to control gypsy moths. The fungus has spread to Illinois naturally. The really good news is that there were several sightings in DuPage County of large numbers of gypsy moth caterpillars being killed by the fungus last month (Figure 5). It is a fungus that is most damaging to caterpillars in the Lymantrid family, such as gypsy moths and tussock moths. Caterpillars killed by *Entomophaga* usually hang upside down in a vertical position (heads down) and look dried up. Whitish-grey spores can sometimes be seen on the hairs of the caterpillar cadavers. *Entomophaga* is not the total answer to gypsy moth control, but can kill a lot of the caterpillars during wet springs.

Later in the season the adult gypsy moths will be emerging, mating, and the females are laying eggs. The males are fairly inconspicuous moths and have brown wings with black markings and a wingspan of about 3.8 cm (1.5 in). They have feathery antennae. Female moths are white to cream-colored with black markings on their wings and have a wingspan of about two inches. Although winged, the females are too heavy to fly, because they are so laden with eggs. Females lay egg masses in July and August on lower branches and trunks of trees, and in sheltered locations such as under loose bark, in woodpiles, on outdoor furniture, or the undersides of vehicles. The egg masses are buff colored, covered with hairs, and about 3.8 cm (1.5 in) long. Each female usually lays one egg mass, which could contain as many as 1,000 eggs. Egg masses can be carefully scraped off bark and destroyed before they hatch in spring. We wait until the leaves fall off the trees to search for egg masses.

Figure 5 Gypsy moth larvae infected with *Entomophaga maimaiga*

Suggested reading: *http://www.na.fs.fed.us/spfo/pubs/fidls/gypsymoth/gypsy.htm*
Time lapse photography of an infected gypsy moth: http://blog.mycology.cornell.edu/?p=293

Figure 6 Hedgehog galls

Hedgehog gall

Oaks are more prone to insect galls than any other tree. One of our favorites is hedgehog galls (definitely not aesthetic eyesores like the other galls are) (Figure 6). We're seeing them on white oak (*Quercus alba*). There are numerous galls of oaks, and many are named according to the way they look. So, with a stretch of the imagination, this one looks a bit like a hedgehog. Some of the other oak galls include spiny, fuzzy, wooly, horned, gouty, button, cola nut, wool sower, apple, bullet, pea, potato, and the jumping oak gall (yes it does jump). When this gall falls from its host, the larvae inside causes the gall to jump up to several inches off the ground. Hedgehog galls are produced by the cynipid wasp, *Acraspis erinacei*, and are usually attached to the leaf midvein. They range in size from 1/4 to 1/2 inch in diameter and are yellow with red and pink 'bristles'. They are absolutely adorable and quite soft.

Control: The galls, like most leaf galls of oaks, cause no significant harm to the tree. Therefore, no controls are recommended

Suggested reading: http://www.ipm.uiuc.edu/landturf/insects/plant_galls/index.html

Thyronectria Canker

Branch dieback symptoms of Thyronectria canker on Caspian-locust (*Gleditsia caspica*) have recently been found. This disease, caused by the fungus *Nectria austroamericana* (Figure 7), is a common and serious canker disease of honey-locust. It is a major cause of decline of thornless honey-locusts in urban plantings in Illinois. The disease is minor in natural woodland areas.

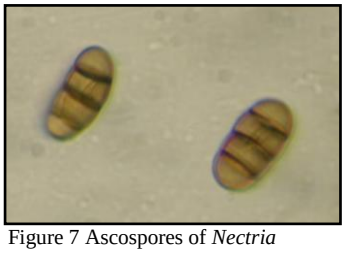

Figure 7 Ascospores of *Nectria austroamericana* (mag 40X)

Thyronectria canker causes girdling branch and trunk cankers that result in branch dieback, reduced foliage, yellowing and wilting of foliage, premature fall coloration, and early leaf drop. Cankers are elongated and slightly sunken with callus ridges sometimes developing with age (Figure 8). The surface of killed bark may have a red-yellow discoloration (Figure 9). Reddish brown discoloration develops in sapwood beneath, and near the cankers, and may extend to the heartwood. Note that the reddish color associated with the center of honey-locust stems is not related to this disease.

Figure 8 Ascomata of *Nectria austroamericana* on a dead honeylocust branch

Control: Prune out dead branches to a branch junction in dry weather and at least one foot below the visible margin of the canker. Clean pruning tools with 70% alcohol or a similar disinfectant between cuts to reduce spread of the fungus. Eliminate drought stress by mulching trees and watering during dry periods. Avoid physical damage to the trees.

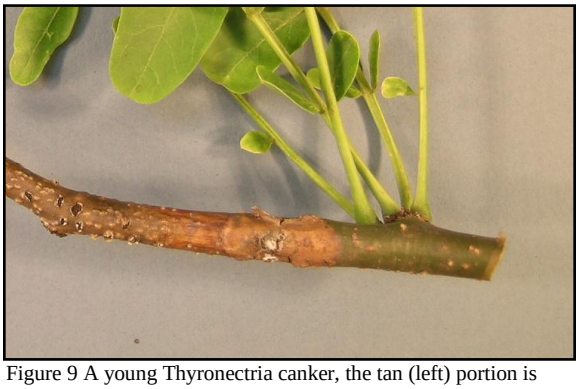

Figure 9 A young Thyronectria canker, the tan (left) portion is infected, the green portion (right) is healthy

Honey-locust cultivars vary in susceptibility to Thyronectria canker. An Illinois test found that canker incidence on inoculated stems was least on cultivars Holka, Imperial, and Shademaster; greatest on Sunburst; and intermediate on Moraine and Skyline.

Suggested reading:
http://www.ext.colostate.edu/pubs/garden/02939.html

Rose rust

Rose rust has been found on Illinois rose (*Rosa setigera* var. tomentosa) leaves (Figure 10). Bright orange powder appears initially as spots on the leaves and later may coalesce as the disease worsens. This powder is actually a cluster of aeciospores of the fungus (*Phragmidium* sp.). These spores reinfect other roses and cause orange-red spots on the leaves and long, narrow lesions on the stems. Leaves may wither and fall off and shoots may become distorted and reddish. Plants infected by this obligate pathogen will gradually decline in vigor.

Control: Infected plant parts should be pruned out and destroyed immediately. After pruning infected mater be sure to sanitize your pruning tools in isopropyl alcohol or a 5% bleach solution. Do not work with the plants in wet weather and provide ample air circulation in plantings. Planting disease-resistant roses is the best prevention. Tea roses are considered highly resistant, while hybrid teas, ramblers, and polyantha types are moderately resistant. For chemical control, refer to the CPM or HYG.

Suggested reading:
http://ohioline.osu.edu/hyg-fact/3000/3063.html

Figure 10 Rose rust foliar sign

Guignardia leaf blotch

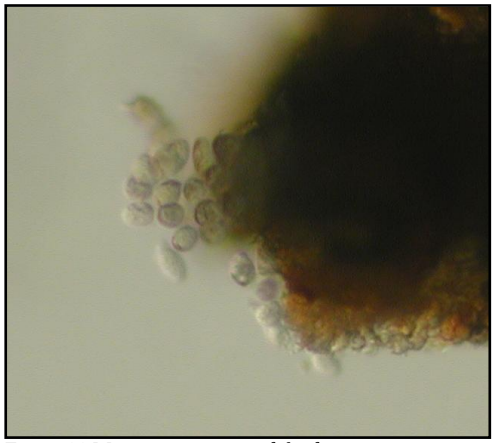

Figure 11 Mature ascospores of the fungus *Guignardia aesculi* emerging from the pseudothecium

The initial stages of Guignardia leaf blotch, caused by *Guignardia aesculi* (Figure 11), were found on horsechestnut (*Aesculus hippocastanum*). Right now the reddish-brown to brown lesions with a yellow border blend into the normal green leaf tissue. Upon closer inspection with a hand lens, you will soon be able to see the dark pycnidia (fungal fruiting bodies), which look like black pepper on the lesions on the upper surface of the leaf. The blotches will enlarge, coalesce, and may cover the entire leaf by the end of summer (Figure 12).

Premature defoliation may follow on the most susceptible hosts. This disease eventually decreases a tree's ability to photosynthesize, but generally the disease doesn't become severe until the tree's annual growth has slowed or is complete. Therefore it does not do much harm to trees in the landscape, but it does make them unsightly. It can be a major problem in nurseries. This is so common, that we've starting thinking that the fall color of the horsechestnut is brown. A few years ago, we rated our *Aesculus* trees for susceptibility to *Guignardia*. We found that in addition to bottlebrush buckeye (*A. parviflora*) being resistant, Japanese horsechestnut (*A. turbinata*), and some Ohio buckeyes (*A. glabra*) show tolerance.

Figure 12 Early symptoms of Guignardia leaf blotch on Ohio buckeye

Control: Removing fallen leaves may help to destroy the overwintering inoculum. Pruning trees to improve air flow may also help, since the spores are spread and germinate under moist to wet conditions.

Suggested reading:
www.umassgreeninfo.org/fact_sheets/diseases/**guignardia_leaf_blotch**.pdf

Diplodia Tip Blight

Symptoms of Diplodia tip blight (*Diplodia pinea*) (also known as Sphaeropsis tip blight) infection on current year needles have been found on pine (*Pinus* sp.) (Figure 13). It is a common disease of two- and three-needle pines in our region. Austrian, mugo, and Scots pines seem to be a magnet for this disease, especially if they are stressed by insufficient water. The fungus infects needles as they are expanding, thus causing stunting and turning the needles straw-colored or brown. Some resin may appear dripping from infected needles.

The disease frequently starts on lower branches and moves upward as spores are spread by splashing rain

Figure 13 Diplodia (Sphaeropsis) tip blight on red pine

and wind. The fungus can also invade woody tissue and cause branches to die. Dead shoot tips and needles from previous years are often found throughout the canopy of larger trees. Black pepper-like fruiting bodies form at the base of the needles (look underneath the needle sheath) soon after the needles die.

Control: Other than proper siting, there is little you can do to prevent the disease. Managing the disease is possible through sanitation, cultural, and chemical control practices. Rake up and discard infected cones and needles to remove inoculum sources. Also, keep trees mulched (do not use diseased pine needles as mulch) and watered during dry periods. Avoid overhead irrigation which helps spread spores, and do not prune susceptible trees in wet weather. As soon as tip blight is noticed, prune out and destroy diseased tissue. Sterilize tools between pruning cuts with 70% alcohol, dilute Pinesol, or a similar disinfectant. Protectant chemicals are effective if applied when needles are first emerging. Chemicals are used commonly in nurseries and plantations, but should be a last resort in landscapes. Refer to the CPM or HYG for specific chemical recommendations. In the future, plant disease-tolerant species or alternative species in your landscape.

Suggested reading: http://na.fs.fed.us/spfo/pubs/factsheets/sphaeropsis/shootblight.htm

Brown rot of stone fruit-update

The peach trees that were reported in Issue 2010.10 with brown rot of stone fruit (Figure 14) have entered another stage of the disease, the pathogen, *Monilinia fructicola*, is infecting the peach fruit. The fungus infects peaches, plums, cherries, apricots, and other *Prunus* species. The disease is first seen as blossom blight – the browning and sudden collapse of blossoms. Leaves are not directly infected. The infection spreads into shoots and twigs during the next several weeks resulting in shoot and twig blight. Cankers, which may be accompanied by a gummy exudate at their margins, form on twigs often causing twig dieback. Powdery-gray masses of spores (conidia) may be observed under wet, humid conditions. The conidia are responsible for fruit infections later in the summer (Figure 13). Infections of fruit start as brown spots that rapidly consume the entire fruit. Infected fruits (mummies) decay and shrivel and generally remain attached to the tree throughout the winter, providing inoculum for the following spring.

Figure 14 A mummy (left) and a peach (right) infected with *Monilinia fructicola*

Remontant flowers

A few magnolias are flowering, such as sweetbay magnolia (*Magnolia virginiana*) (Figure 15). Magnolias are spring-flowering trees, but it's not uncommon that the plants get "confused" and bloom later in the season. Since only a few flowers on each tree are blooming, the remaining flower buds will remain dormant and should bloom at the normal time next spring.

Figure 15 Remontant flower of sweetbay magnolia (*Magnolia virginiana*)

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.

Nikko Maple (*Acer maximowiczianum* formerly *A. nikoense*) (Figure 16)

Family: Sapindaceae
Native: Japan, Central China. Introduced 1881.
Mature Size: 20-30', vase-shaped habit
Hardiness: Zone 5-7
Foliage: Opposite, trifoliate, emerge bronze in the Spring, turning green, fall color yellow, purple, or red. Leaflets are ovate with a coarsely dentate or entire margin, pubescent underneath, middle leaflet is the largest and is short-stalked.
Bud/stem: Typical of a maple, the brown imbricate buds are sharp-pointed and occur on slender brown stems dotted with prominent lenticels. Stems are pubescent near the tip turning glabrous with age.
Flower/fruit: Yellow flowers, occur in spring, in nodding cymes, non-showy. Fruits are a samara, densely pubescent, up to 2" long.
Bark: Attractive smooth gray bark.

Figure 16 Nikko Maple (*Acer maximowiczianum* formerly *A. nikoense*). Photo curtosey of MSU

Culture/Usage: Considered to be slightly more cold hardy than *Acer griseum,* the Nikko Maple prefers average, well-drained soil in part shade to full sun. It is an unusual tree that is an excellent addition to a small yard. It offers attractive foliage, fall color, and a beautiful habit. This tree is virtually problem-free, but it is not readily available in the trade (though it is worth seeking out)!
Get An Up-Close View!: What a beautiful day for a hike out to the Maple Collection! Find this week's WOW in the Maple Collection, located just off the mulch pathway at the grid location (labeled as *A. nikoense):* V-98/36-83. It's worth hunting for! While you're there, check out the other unusual Maples growing in this lovely collection!

Interesting fact of the week: While the botanic name is quite a mouthful, the common name simply honors the town of Nikko, Japan. *A. maximowiczianum* (formerly known as *A. nikoense)* is named for Russian botanist Karl Maximowicz, who discovered the plant in 1860. In his lifetime, he named over 2300 plants! Particularly interested in the plants of Japan, he became the Director of the herbarium at the Saint Petersburg Botanical Garden in 1869. His dedication to plant exploration and discovery led to a long list of plants named for him. Among these are: *Betula maximowicziana* (Monarch Birch), *Picea maximowiczii* (Maximowicz Spruce), and *Populus maximowiczii* (Maximowicz' Poplar).

Fungus of the week: Coral fungi (Family Clavariaceae)

This week an entire family of fungi are being recognized. The Clavariaceae is composed of several fungi that look like they belong in the Great Barrier Reef off the coast of Australia. These beautiful, and maybe a little bizarre-looking, fungi are common saprophytes and are commonly found in woodlands, in old damp mulch, on logs and stumps. The color of coral fungi range from deep purple, magenta pink, bright yellow, white, cream, and browns; they truly are a sight to see. Some species of coral fungi are edible, while others are edible and have a laxative-like effect on the consumer. With the deluge of rain the Lisle-area has gotten in the past week, several coral fungi have been found on the grounds of The Morton Arboretum. Happy hunting!

Clavaria vermicularis. Photo courtesy of Jason Sturner, taken at The Morton Arboretum

Clavulina amethystina. Photo courtesy of Jason Sturner, taken at The Morton Arboretum

Ramaria stricta. Photo courtesy of Stephanie Adams, taken at The Morton Arboretum

Clavulina amethystina. Photo courtesy of Jason Sturner, taken at The Morton Arboretum

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:

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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.