Plant Health Care Report

The Morton Arboretum

Scouting Report of The Morton Arboretum

May 7, 2010 **Issue 2010.04**

Our report includes up-to-date disease and insect pest reports, as well as color images, for northeastern Illinois. You'll also find a table of accumulated growing degree days throughout Illinois, precipitation, and plant phenology indicators to help predict pest emergence.

Quick View

What Indicator Plants are in Bloom at the Arboretum?
Bridal wreath spirea (*Spiraea x vanhouttei*) (Figure 1)

Accumulated Growing Degree Days (Base 50): 246
Accumulated Growing Degree Days (Base 30): 1240

Weekly reminder
What to look for in the next week

Insects

- Euonymus webworm
- European pine sawfly
- Elm leafminer
- Spittle bug
- Hemlock needle miner
- Wooly alder aphid
- European fruit Lecanium scale
- Erineum gall
- Bronze birch borer

Diseases

- Oak leaf blister
- Peach leaf curl
- Powdery mildew
- Phomopsis tip blight
- Rose rosette disease
- Black spot on rose
- Oak anthracnose
- Maple anthracnose

Fungus of the week: *Schizophyllum commune*

Figure 1 Bridal wreath spirea (*Spiraea x vanhouttei*)

Degree Days and Weather Information

As of May 5, 2010, we are at 246 base 50 growing degree days (GDD), which is approximately seven calendar days (54 GDD) ahead of the historical average (1937-2009) and sixteen calendar days (134 GDD) ahead of last year.

Location	Growing Degree Days through May 5	Precipitation between April 30 – May 5 in inches
The Morton Arboretum (Lisle, IL)	246	3.44
Chicago Botanic Garden (Glencoe, IL)*	240	1.38
Chicago O-Hare Airport*	264	1.10
Aurora, IL**	263.7	
Champaign, IL**	352	
DuPage County Airport (West Chicago, IL)**	261.3	
Decatur, IL**	376.1	
Moline, IL**	345.5	
Peoria, IL**	373.4	
Quincy, IL**	384	
Rockford, IL**	255.2	
Waukegan, IL**	192.3	
Wheeling, IL**	228.1	

*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:

After you've planted your last Arbor Day tree, remember to continue to water your tree throughout the growing season until the trees have gone dormant for the year. Trees need about an inch of water a week, which is more water than turf grass needs. When watering make sure the water goes through the mulch and reaches the root-ball, ensuring that the roots are getting adequate water. The first few years after planting trees they need more care and attention to become established in the landscape. A helpful hint with transplant shock is that for every inch caliper of the tree's truck will equal the number of years the tree will be undergoing transplant shock.

What to look for in the next week:

Oak leafroller, black spot on elm, fireblight of rosaceous trees, spindle gall on *Tilia*, *Aesculus* leafminer, spiny witch hazel aphid, frogeye leaf spot, apple scab, sumac flea beetle, and spruce spider mite

Thank you…

I would like to thank the volunteers that scouted and found most of the insects and diseases that are in this report. The Scouting Volunteers include: Fritz Porter, Laurie Blackmon, Betsy Morton, Ann Klingele, Loraine Miranda, Bill Coates, Davida Kalina, and Mary Carter Beary. Your hard work is appreciated.

This Week's Sightings…

Euonymus webworm

Figure 2 Euonymus webworms (*Yponomeuta cognatella*)

Euonymus webworms (*Yponomeuta cognatella*) (Figure 2), also known as euonymus caterpillars, are feeding on running strawberry-bush (*Euonymus obovatus*). Larvae are pale yellow with black spots, eventually reaching 2.54 cm (one inch) at maturity.

They are leaf-feeding insects that live in colonies within thin webs at branch ends. The web increases with size as the larvae feed on the leaves and continue to grow themselves. Euonymus webworm also attacks spindle tree (*E. europaeus*).

Control: Small populations can be managed by pruning out webs now and soaking them in soapy water. *Bacillus thuringiensis* var. *kurstaki* (*Btk*) will control young larvae, although it is less effective on mature larvae. Spray the web thoroughly with Btk, as the insects must eat the Btk in order for it to work.

Suggested reading: http://hyg.ipm.illinois.edu/pastpest/200806g.html

European pine sawfly

European pine sawfly (*Neodiprion sertifer*) larvae (Figure 3) are just hatching and are feeding on needles of red pine (*Pinus resinosa).* As a defense mechanism, groups of sawfly larvae rear up their heads simultaneously when disturbed, making the group appear to be one much larger organism. Right now the larvae are less than 0.65 cm (0.25 in) long, but already you can see their black heads. When fully grown, the sawflies will be about 1.9 – 2.54 cm (0.75 - 1 in) long and have several light and dark green stripes on each side of their bodies. Their heads and the first three pairs of legs are black. Their mouths are so small after hatching, 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. Then they drop down into the ground to pupate, emerging in September as adults to mate and lay eggs. The eggs look like small gold dots along the needles. In an extremely heavy infestation, trees could be entirely defoliated or stunted. But because new growth is rarely attacked, the trees survive.

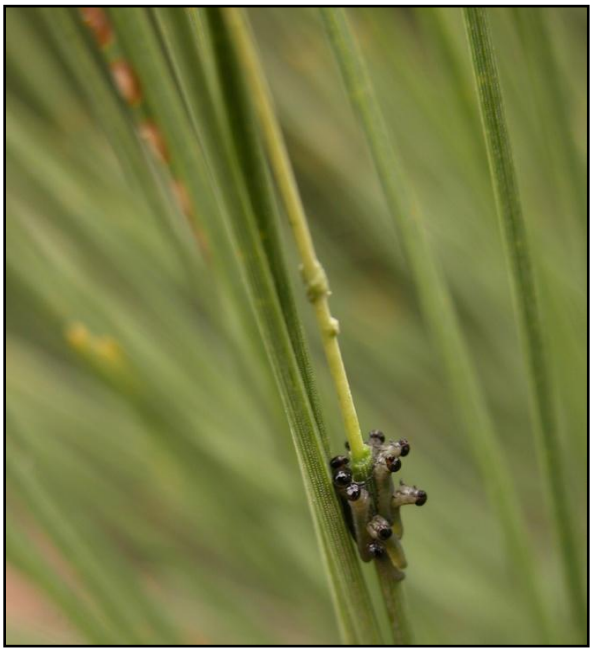

Figure 3 European pine sawfly (*Neodiprion sertifer*)

Control: Birds feed on the larvae and rodents eat the pupae in the soil, but these predators are usually inadequate to control the larvae. At the Arboretum, we usually pick off the larvae and squish them for control. If you can find the needles before the larvae hatch, remove the needles. European pine sawfly larvae are not caterpillars, thus *Btk* does not control them. In severe infestations, insecticides are also effective if applied early. For chemical recommendations, refer to the *2010 Commercial Landscape and Turf Management Pest Handbook* (CPM) from

the University of Illinois if you are a commercial applicator in Illinois or *Home, Yard and Garden Pest Guide* (HYG) from the University of Illinois if you are a homeowner.

Suggested reading: http://woodypests.cas.psu.edu/factsheets/insectfactsheets/html/European_Pine_Sawfly.html

Elm leafminer

Figure 4 Elm leaf miner (*Fenusa ulmi*) larvae

First instar elm leaf miner (*Fenusa ulmi*) larvae (Figure 4) are starting to form mines on Weeping American elm (*Ulmus americana* f. *pendula*) (Accession number 678-70) and Small Fruited elm (*U. microcarpa*) (588-2006). The adults emerge in spring to lay eggs in elm leaf tissues. After about a week, the eggs hatch and young larvae begin to make mines in the leaves. The sawfly larvae are feeding on the leaf tissue between the upper and lower epidermis of the leaves. The mines at first look like U-shaped brown spots between veins in the leaf (Figure 5). Eventually the insects will eat a hole through the leaf epidermis, fall to the ground, and excavate a hole in the soil to overwinter. Severe damage can result in defoliation. To test a leaf for miners, hold the leaf up to the light. If the insect is still in the leaf, you can see it. You will also be able to see frass (insect feces) which looks like pencil shavings within the mined area. Other susceptible elms include the American elm (*U. americana),* English elm (*U. procera*), and Armenian elm (*U. elliptica*). They spend most of their life cycle burrowed about an inch in the ground.

Figure 5 Mines created by elm leaf miner (*Fenusa ulmi*) larvae

Control: We are unaware of any nonchemical control. There is only one generation per year, and the leaves that emerge later will not be infested.

Suggested reading:
http://www.ext.colostate.edu/pubs/insect/05548.html

Spittle bug

Spittle bugs (*Aphrophora* sp.) are now active on European larch (*Larix decidua*). You can identify them by the frothy white mass found on foliage and twigs (Figure 6). It looks like tiny areas of dish soap bubbles. The spittle, consisting of plant juices, is made by the immature bug to keep it moist and protect it from its enemies. Spittlebugs suck plant sap but inflict little damage on mature plants. There are a number of species of spittlebugs that feed on both deciduous and evergreen plants in our region.

Figure 6 Spittle bug (*Aphrophora* sp.) on geranium

Control: Control is rarely necessary, but according to Michigan State University, hosing the plants down forcefully with water is usually sufficient to remove most of the insects. This may need to be repeated a few times.

Suggested reading: http://urbanext.illinois.edu/focus/spittlebug.cfm

Hemlock needle miner

Figure 7 Hemlock needleminers (*Coleotechnites macleodi*)

Hemlock needleminers (*Coleotechnites macleodi*) (Figure 7) were found on Eastern hemlock (*Tsuga canadensis*) (169-U). The term "needle miner" describes the larval feeding habits of insects that bore into and feed on the soft internal tissue of evergreen needles. These tiny caterpillars hatch in July, enter leaves near the base, and feed on green tissue inside the needle, leaving the epidermis of the needle intact. They bind needles together with webs, so you see clusters of brown, mined needles throughout the tree (Figure 8). The insect overwinters as a larva and resumes feeding in the spring.

Control: Hemlock needleminer is considered a minor pest and control is usually not necessary.

Figure 8 Damage due to hemlock needleminer activity

Suggested reading:
http://www.forestpests.org/caterpillars/brownhemlock.cfm

Woolly alder aphid

Small masses of woolly alder aphids (*Paraprociphilus tessellates*) (Figure 9) have been found on the lower trunks of European alder (*Alnus glutinosa*) (490-85). Aphids are small, 2.1 mm (0.083 in) long, and are identified by their sucking mouthparts, long, thin legs, long antennae, pear-shaped body, and pair of tube-like structures (called cornicles) emerging from their abdomen that look somewhat like tailpipes. Two hosts are needed to complete their life cycle: alders and silver maples. The eggs are usually laid in fall in the bark of the maples. When the young hatch in spring, they collect on leaves and reproduce. Their offspring fly to alders and collect on the twigs where new generations develop. They are small and covered with white waxy filaments. In fall, they will fly back to the silver maples to lay eggs. They do little damage.

Control: Aphids can be dislodged from plants using a strong jet of water from the hose (syringing). Periodic syringing will keep the aphid populations low and allow the parasites and predators to build up to effective control levels.

Suggested reading:
http://www.ipm.iastate.edu/ipm/hortnews/2000/7-21-2000/woollyaphid.html
http://www.entomology.umn.edu/cues/Web/223WoollyAlderAphid.pdf

Figure 9 Woolly alder aphids (*Paraprociphilus tessellates*)

European fruit Lecanium Scale

Figure 10 European fruit Lecanium scale (*Lecanium* sp.)

European fruit Lecanium scale (*Lecanium* sp.) (Figure 10) were found on trailing juniper (*Juniperus horizontalis*) (526-81) and Chris Henning, Chicago Botanic Gardens, has reported seeing Lecanium scale on maples (*Acer* sp.). Lecanium scales are common pests in North America and include about a dozen species that attack a wide variety of shade and fruit trees and ornamental trees and shrubs. They vary in size, color, and shape, depending somewhat on the host plant they attack. The adult scale length varies from 3 mm - 12 mm (0.125 to 0.5 in).

Most species of Lecanium scales have similar life cycles. Eggs are laid beneath the females beginning in late spring to early summer. After egg laying, the female's body dries, becomes brittle, and turns brown. This "scale" covering provides protection to the developing eggs. Crawlers emerge soon after and migrate to leaves to feed on plant sap. Infested plant leaves are often covered with sooty mold, a black fungus that grows on the honeydew excreted by the scales as they feed. In severe infestations, Lecanium scales will cause some twig dieback and premature leaf drop.

Control: Prune out heavily infested branches. Control heavy infestations with summer oils, insecticidal soaps, or insecticidal sprays. Beneficial insects, such as ladybird beetles and parasitic wasps, help control these pests so use insecticides sparingly and only if less toxic means don't work. Applications should be made when crawlers are present. Repeat applications will likely be needed. Dormant oil sprays can be applied next year in early spring, prior to leaf emergence, to control overwintering females. Note – some summer and dormant oil applications may be toxic to certain maple species, including Japanese and sugar. Also, oils should not be used on plants when wilting or under drought stress, or during excessive heat and humidity conditions. For chemical control recommendations refer to the CPM or HYG.

Suggested reading: http://www.mortonarb.org/plantinfo/plantclinic/pests_scaleinsects.pdf
http://www.ipm.uiuc.edu/greenhouse/insects/lecanium_scales/

Erineum gall

Figure 12 Erineum gall

Erineum galls have been found on bur oak (*Quercus macrocarpa*) (316-85). These galls are formed due to the feeding of Eriophyid mites (Family Eriophyidae), which are microscopic (0.05 – 2 mm; 0.002 – 0.008 in). The velvety red patches (Figure 12) are found on the underside of the leaves, while the upper surfaces show slight disfiguring due to feeding damage. Erineum galls are found on several plant species including maples, beech, and birch, even though the mites are host specific. The mites overwinter as adults under the bark of the host trees and emerge in the spring and immediately begin feeding. Although the galls are very visible due to their bright colors, the hosts are rarely harmed enough for treatment.

Suggested reading:
http://www.entomology.umn.edu/cues/Web/167MapleVelvetgallMites.pdf
http://www.ipm.iastate.edu/ipm/hortnews/node/2105

Bronze birch borer

As the leaves have begun to emerge this spring we're seeing the damage due to the bronze birch borer (*Agrilus anxius*). This insect overwinters in the larval stage in tunnels beneath the bark of its host. Adults emerge in late May to early June and continue into August leaving characteristic D-shaped exit holes in the bark. About one week after emergence, females begin laying eggs in crevices and cracks in the bark. The eggs hatch in 10 to 14 days, and the larvae immediately bore into the cambium layer, and occasionally into the sapwood, where they feed and tunnel in a zigzag manner. Larva tunneling severely injures the tree's vascular system, disrupting the flow of water and nutrients. Girdling of the cambium of a branch or trunk by tunneling larvae results in sudden wilting and death of the branch or entire tree, which we're seeing now.

Early symptoms of infestation are sparse chlorotic foliage in the upper crown followed by leaf wilting and branch dieback (Figure 13). Ridges and bumps caused by tunneling can often be seen on branches (Figure 14).

The bronze borer is considered a secondary pest that attacks stressed trees. Larvae have been reported to be unable to survive in healthy trees. All birches can be attacked but paper, white, and water birch are among the preferred species.

Figure 13 Symptoms of bronze birch borer infestation include sparse chlorotic leaves, wilting, and ridges or bumps in the branches

Control: The most important factor in managing the bronze birch borer is to maintain tree vigor through proper fertilization, watering, and controlling aphids and leafminers. Do not prune susceptible birches during the adult flight period from late May through August since this may attract more egg-laying females. Prune off dead and dying branches in fall and winter. Systemic insecticides provide protection and should be applied in early spring. Refer to the CPM and HYG for chemical recommendations.

In the future, plant resistant birches and site them properly. Birches should be planted in shady, cool, and moist wooded areas; otherwise they are more likely to become stressed, lose vigor, and succumb to attack. River, monarch, and heritage birch have shown resistance to this borer.

Figure 14 Ridges and bumps caused by tunneling of the bronze birch borer

Suggested reading: http://www.ag.ohio-state.edu/~ohioline/hyg-fact/2000/2018.html
http://www.na.fs.fed.us/spfo/pubs/fidls/br_bir_bor/bbbfidl.htm

Oak leaf blister

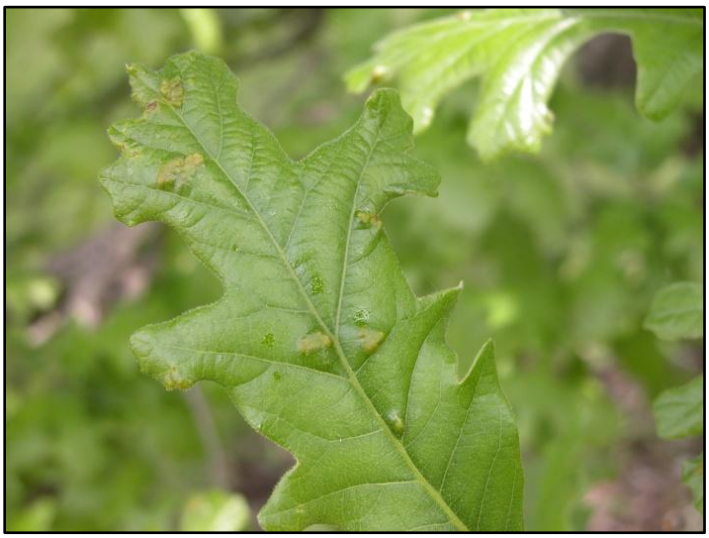

Figure 15 Early symptoms of oak leaf blister, caused by the fungus *Taphrina caerulescens*, on red oak

Early oak leaf blister symptoms (Figure 15) caused by the fungus, *Taphrina caerulescens*, have been found on bur oak (*Quercus macrocarpa*). In spring and early summer, leaves develop wrinkled, raised, pale whitish-yellow blisters on their upper surface and corresponding pinkish-gray depressions on the lower leaf surface. Blisters range from 0.254 – 2.54 cm (0.10 – 1 in) in diameter. As they age and merge, the blisters turn red brown with pale yellow margins and the leaf may become distorted. Red oak (*Quercus rubra*) is the most susceptible species. Oak leaf blister, like other *Taphrina* diseases (e.g., peach leaf curl and plum pockets), usually develops only during cool, wet springs and is more homely than harmful to the oaks. Infected leaves become distorted and may prematurely drop. The disease usually dissipates during the summer.

Control: The fungus survives the winter on twigs and bud scales. On oak, leaf blisters are more unsightly than harmful, so control is not a high priority. However, a single, dormant season application of fungicide can help; fungicides applied after budbreak are useless. Refer to the CPM or HYG for chemical control information.

Suggested reading: http://ipm.illinois.edu/diseases/rpds/663.pdf

Peach leaf curl

Peach leaf curl (*Taphrina deformans*) (Figure 16) was diagnosed at the plant clinic this week. This fungal disease is most severe when cool, wet weather is prevalent when the leaves are first emerging. Young, succulent leaves become puckered and deformed as they develop. The puckered areas turn yellow and then red. A white bloom appears on the deformed part of the leaf. Shortly after, the leaves turn yellow and fall off. Diseased twigs become swollen and stunted. Diseased fruits also become distorted and swollen with discolored areas on the skin. Peach leaf curl generally does not kill the tree, but annual infections may weaken a tree and predispose it to other problems.

Figure 16 Peach leaf curl (*Taphrina deformans*)

Control: The fungus overwinters in buds. Fungicides are only effective when applied in fall after leaf drop or in spring before buds swell. Once the leaves have emerged, fungicides are no longer effective. For specific chemical recommendations, refer to the CPM and HYG.

Suggested reading: http://urbanext.illinois.edu/hortanswers/detailproblem.cfm?PathogenID=35
http://www.agcom.purdue.edu/AgCom/Pubs/BP/BP-54.pdf

Powdery Mildew

Powdery mildew is appearing on the leaves of Diablo ninebark (*Physocarpus opulifolius* 'Monlo'), turf grass, and currant (*Ribes* sp.). Hundreds of plant species are susceptible to powdery mildew, but the disease is caused by many different fungal species, which are host specific. This means that the powdery mildew on coralberry will not infect lilacs and so forth.

Figure 17 White patches are signs of powdery mildew infections

Powdery mildew appears as a superficial white to gray coating over leaf surfaces, stems, flowers, or fruits of affected plants (Figure 17). Initially, circular powdery white spots appear. These spots coalesce producing a continuous patch of "mildew." Later in the season, cleistothecia (fungal fruiting bodies that look like black pepper under a hand lens) will appear. Warm days and cool nights favor this fungal disease. This disease is one of the few that is deterred by free water since spores will not germinate in free water on leaves. However, the disease still needs high humidity to infect the plant. Leaf curling and twisting result, and in severe infestations you may see premature defoliation and deformed flower buds. Although unsightly, powdery mildew is usually not fatal in the landscape.

Control: Infected plant parts should be removed as soon as symptoms appear. Dispose of fallen leaves, and do not handle plants when foliage is wet. Water plants during periods of drought to keep them healthy. High humidity can increase disease severity so avoid overhead watering in late afternoon or evening. Provide proper plant spacing for good air circulation. Powdery mildew on some plants can result in significant damage and fungicides may be needed. To obtain optimum results, spray programs should begin as soon as mildew is detected. For chemical recommendations, refer to the CPM or HYG. There are several ornamental plants that are resistant to powdery mildew. In the future, plant resistant cultivars and species.

Suggested reading: http://ohioline.osu.edu/hyg-fact/3000/3047.html
http://plantclinic.cornell.edu/FactSheets/powdery/powdery.htm

Phomopsis tip blight

We are seeing Phomopsis tip blight damage, caused by the fungus *Phomopsis juniperovora*, from last year's infection (Figure 18) on several juniper species (*Juniperus* sp.) and arborvitae (*Thuja* sp.). Phomopsis tip blight damages new growth and succulent branch tips of junipers from mid-April through September. However, new symptoms don't occur until late in the growing season and during winter on the terminal four to six inches of branches. Foliage turns yellow, then brown and eventually gray as the fungus girdles branches and causes blighting of foliage beyond the infection point. In the advanced stage, pinhead-sized black pycnidia, the reproductive structures of the fungus, can be found on blighted twigs, particularly the gray colored areas. Old, mature foliage is resistant to infection. Note that similar branch tip dieback symptoms may result from winter injury, frost damage, and drought; however, injury from abiotic sources will be more uniformly dispersed on a plant and may not result in black fungal fruiting bodies. Also, there are a handful of other juniper twig and foliage diseases, but these are not as harmful or prevalent as Phomopsis. Repeated blighting of junipers in early summer can result in witches' broom, stunting and, in severe cases, plant death.

Figure 18 Phomopsis tip blight symptoms on *Taxus*

Phomopsis tip blight affects many different members of the cypress family but is most severe on junipers, especially eastern red-cedar (*Juniperus virginiana*), Rocky Mountain (*J. scopulorum*), and creeping junipers (*J. horizontalis*). Phomopsis blight has also been found on various species of cypress, false cypress, fir, larch, and white-cedar.

Control: Spores of *Phomopsis* are produced on the blighted twigs throughout the summer so infection can occur whenever succulent foliage and twigs are available and moisture or humidity is high. Eliminate the source of the spores, which are found on blighted twigs, by pruning dead and dying tips now. Remove tissue four to six inches below the symptoms and restrict pruning to dry weather.

Avoid excessive shearing and high nitrogen fertilizers that encourage succulent growth. Space plants to provide good air circulation and avoid heavily shaded areas. Water plants in early morning so the foliage dries before nightfall. If you've had severe problems in the past, chemical sprays should be applied when new flushes of growth appear later this spring. Refer to the CPM, for commercial applicators, and the HYG, for homeowners, for specific chemical recommendations.

The following junipers have been found to be resistant to Phomopsis tip blight:

- *Juniperus chinensis* cultivars 'Hetzii'*, 'Ketelerri'*, 'Mas'*, 'Mountbatten'*, 'Robusta Green'*
- *Juniperus communis* 'Depressa', 'Oblonga pendula'
- *Juniperus horizontalis* 'Douglasii', 'Procumbens'
- *Juniperus sabina* 'Arcadia', 'Broadmoor'
- *Juniperus scopulorum* 'Moffettii'*
- *Juniperus squamata* 'Fargesii'
- *Juniperus virginiana* 'Cineracscens', 'Globosa', 'Peptans'

*Plants are also resistant to *Kabatina*, which is another fungal infection of junipers. More information on *Kabatina* can be found: http://www.mortonarb.org/component/content/article/193-insects-diseases/725-juniper-tip-blight.html

Suggested reading: http://plantclinic.cornell.edu/FactSheets/junipertipblight/juniper.htm
http://ohioline.osu.edu/hyg-fact/3000/3056.html

Rose rosette disease

Rose rosette disease has been found causing tiny, stunted leaves on several various rose cultivars (*Rosa* sp.) (Figure 19). Rose rosette is believed to be caused by a virus or virus-like organism and is vectored by a small eriophyid mite. It can also be spread through grafts. *Rosa* sp. are the only known hosts, and all types of roses are infected, though multiflora is the most common host. Plants often die within one to two years after infection.

It is not always easy to diagnose this disease as symptoms vary depending on the species or cultivar infected. When all of the symptoms listed below are present, diagnosis is relatively straightforward. However, a diseased plant usually exhibits just a few of these symptoms, especially in the early stages of the disease.

SYMPTOMS

- Rapid elongation of new stems, followed by development of witches' brooms that appear as numerous red side shoots growing in different directions.
- Tiny and distorted leaves that often, though not consistently, have a red coloration or a mosaic of green, yellow, and red.
- Thorns that are much more abundant than normal, often giving a somewhat hairy appearance to the cane.
- Canes that are thicker than the parent cane from which they emerged.
- Short, deformed shoots, often with red blotches.
- Distorted flowers with fewer petals than normal and abnormal coloration.
- Aborted buds, deformed buds, or buds that are converted to leaf-like tissue.

Figure 19 Non-infected rose (top) and rose showing symptoms of rose rosette disease (bottom)

Control: Infected plants cannot be cured and should be dug up and destroyed (including roots) when symptoms first appear.

Suggested reading: http://hyg.ipm.illinois.edu/article.php?id=101
http://ipm.illinois.edu/diseases/series600/rpd666/index.html

Black spot on rose

Figure 20 Black spot is caused by the fungus *Diplocarpon rosae*

The early symptoms of black spot of rose have been found on rugosa rose (*Rosa rugosa*) (Figure 20). Black spot is caused by the fungus *Diplocarpon rosae*. Round to irregular black leaf spots with fringed margins appear on either leaf surface but primarily on the upper surface. When infection is severe, the entire leaf will turn yellow and drop. Repeated defoliation will lead to reduction in flower quality and quantity, stunting and weakening of the plant, and increased susceptibility to other diseases.

The fungus overwinters on fallen leaves and diseased canes. Spores are splashed by water or wind-blown rain from fallen leaves and cane lesions to newly emerging leaves and succulent stems in the spring. Warm temperatures, combined with wet leaves and high humidity, will result in abundant spore germination and infection in about one day. Black spots become evident 3 to 16 days later.

Control: Remove infected leaves and canes to reduce inoculum. Plant roses in sunny locations with good air circulation and avoid overhead watering. Avoid planting them too densely. Fungicides should be applied as soon as leaves emerge and continued, at labeled intervals, until leaves drop in the fall. Lengthen spray intervals or skip applications during dry weather. For specific chemical recommendations, refer to the CPM or HYG. Planting resistant varieties is the best way

to prevent this disease. The Purdue University Extension has listed many varieties of roses that are reported to be resistant. See http://www.ppdl.purdue.edu/ppdl/weeklypics/3-22-04.html for more details.

Suggested reading: http://urbanext.illinois.edu/hortanswers/detailproblem.cfm?PathogenID=6
http://www.extension.iastate.edu/news/2007/may/071101.htm

Oak anthracnose

Oak anthracnose, caused by *Discula quercina*, has been found on bur oak (*Quercus macrocarpa*) (Figure 21). Symptoms on trees in the white oak subgenus follow one of three patterns: 1) Early infection in which young leaves turn brown and shrivel during leaf expansion (this is what we are seeing now) 2) A later infection in which large, irregular blotches develop and distort leaves. The lesions then dry, become papery, and may turn tan to white and 3) A third pattern occurs when mature leaves are infected and develop small necrotic spots. All three patterns typically start at the bottom of the tree because of high moisture and rainfall flow.

Figure 21 Oak anthracnose symptoms on chestnut oak (*Quercus prinus*)

Control: In most years, control of anthracnose on oaks is unnecessary because the disease does not affect the long-term health of oak trees. Collecting and destroying fallen leaves and twigs, and pruning dead twigs, will help reduce the overwintering population of the pathogen. Pruning during the dormant season will also increase air circulation and lower humidity within the canopy. Mulching and watering (not overhead) during dry periods will help keep trees healthy. Chemical sprays to control anthracnose are rarely justified except when the disease occurs in stressed or recently transplanted trees, or when the disease causes repeated defoliations. Refer to the CPM or HYG for information on chemical control.

Suggested reading: http://ohioline.osu.edu/hyg-fact/3000/3048.html
http://www.na.fs.fed.us/spfo/pubs/fidls/anthracnose_east/fidl-ae.htm

Maple anthracnose

Figure 22 Tan anthracnose symptoms on sugar maple (*Acer saccharum*)

Early maple anthracnose symptoms were reported by David Conrad of Nels Johnson Tree Experts, Inc. in Lake Forest, IL. There are three types of foliar symptoms that are caused by two or more different fungi: (1) elongate lesions that form initially along the vein and extend into interveinal areas; (2) irregularly shaped necrotic spots that are often centered on veins; and (3) necrotic blotches that cover large areas of the leaf. We are seeing both necrotic spots and elongated lesions. The disease is typically more severe during cool, wet weather, sometimes even causing defoliation.

Anthracnose necrotic spots can be mistaken for early leaf spots caused by *Phyllosticta minima*, a fungus that causes leaf spots on several species of maples. *Phyllosticta* lesions are initially brown; however, as they age, they develop tan centers and usually form distinct red to purple borders. Unlike anthracnose, black pycnidia (fruiting bodies) are produced in the *Phyllosticta* lesions.

Control: Maple anthracnose is primarily an aesthetic problem. Proper fertilization and irrigation of trees that have considerable disease may help trees refoliate and maintain their vigor. Because spores overwinter in infested fallen leaves, remove these leaves from the property to prevent next year's infection.

Suggested reading: http://urbanext.illinois.edu/hortanswers/detailproblem.cfm?PathogenID=5
http://ohioline.osu.edu/hyg-fact/3000/3048.html

Fungus of the week: *Schizophyllum commune*

David Arora, author of *Mushrooms Demystified*, states that *Schizophyllum commume* (Figure 23) is a cosmopolitan fungus, meaning that it is found all over the world. This small (1-4 cm (0.38 – 1.6 in)) leathery shelf-fungus is covered in hairs, which gives it a fuzzy appearance. Its color ranges from white to medium gray and the gills radiate out from the point of attachment.

Figure 23 *Schizophyllum commume*

Observing the color of a fungus's spores in mass is a diagnostic characteristic that aids in fungal species identification. To obtain a spore print, take the mature fungal thallus (fruiting body) (mushroom cap, fungal shelf) and lay it on a pure white sheet of paper. Allow the thallus to sit on the paper for several hours. In this time the spores will fall to the paper. Caution: spores are easily disturbed by small movements and breezes, so take care when moving them around. Once the spores are collected their color can be observed. Once the spore color has been determined, reference materials will aid in fungal identification.

The spore print of *S. commune* is white. It's commonly found on hardwood sticks, stumps, logs, and dead branches Some of the more common hosts include hickory, elm, walnut, and elm. At The Arboretum it has also been found on dying peach tree branches. It has been known to cause white rots in trees. White rot is a type of wood decay when lignin, cellulose, and hemicelluloses are broken down, which results in a bleached appearance. During dry periods the thallus (body) shrivels up and remains attached to the substrate. Then when exposed to water it resumes a more shelf-like appearance.

Suggested reading: http://www.mushroomexpert.com/schizophyllum_commune.html
http://botit.botany.wisc.edu/toms_fungi/feb2000.html

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; Doris Taylor, Plant Information Specialist, and by Carol Belshaw, Plant Clinic 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:

Indicator plants are chosen because of work done by Donald A. Orton, and are published in *Coincide, The Orton System of Pest and Disease Management*. This book may be purchased through the publisher at: http://www.laborofloveconservatory.com/

The *2010 Commercial Landscape & Turfgrass Pest Management Handbook* (CPM), for commercial applicators, and the *Home, Yard & Garden Pest Guide* (HYG) for homeowners from the University of Illinois, are available by calling (800-345-6087).

National Audubon Society: *Field Guide to Mushrooms.* 1981. Published by Alfred A Knopf, Inc. ISBN: 0-394-51992-2

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

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.