

# Plant Health Care Report



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## Scouting Report of The Morton Arboretum

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June 5 – June 11, 2004

Issue 2004.10

The Plant Health Care (PHC) Program at The Morton Arboretum involves monitoring diseases and insects of woody plants at the Arboretum and alerting others about our findings. Each week during the growing season, we will provide timely information about what we are seeing and how you can identify and manage problems.

## Degree Days and Weather Information

As of June 8, 2004, we are 142 growing degree days (base 50) (GDD) ahead of average and 234 GDD ahead of last year. The National Oceanic and Atmospheric Administration is predicting normal temperatures and average precipitation for the upcoming week. In our region, average temperatures for next week are approximately 84° F (high) and 58° F (low).

Location*	Growing Degree Days through June 8	Precipitation June 2 – June 8	
		mm	inches
The Morton Arboretum (Lisle, IL)	754	13	0.51
Chicago Botanic Garden (Glencoe, IL)	556	3	0.12
Chicago O'Hare Airport	589	1	0.02
N. Barrington, IL	535	2	0.06
Orland Park, IL	728	11	0.45
Regent's Park (Rockford, IL)	651	1	0.03

\*Thank you to Mike Brouillard, Moore Landscapes, Inc.; Lee Miller, Chicago District Golf Association; Tom Tiddens, Chicago Botanic Garden; and Bill Kramer, University of Illinois Extension for supplying us with degree-day and precipitation information.

## Plant Phenology



### What's in bloom at the Arboretum?

Fuzzy deutzia (*Deutzia scabra*) (photo on left) and Northern catalpa (*Catalpa speciosa*) are in full bloom. Winterberry holly (*Ilex verticillata*) is in early bloom.

# This Week's Sightings

## Black Vine Weevil

Black vine weevil (*Otiorhynchus sulcatus*) damage has been seen on the leaves of purple rhododendron (*Rhododendron catawbiense*). Adult black vine weevils are nocturnal creatures that feed along leaf margins producing three mm (1/8 inch) crescent-shaped notches (photo on right). Moderate notching has little effect on plant health. The more serious damage is done by the larvae which consume tender feeder roots causing foliage of infested plants to turn yellow or brown. When young roots become scarce or the soil becomes excessively moist, the larvae will move to larger roots at the base of the plant. Severe larval infestations can ultimately kill the host plant.



Adult female weevils emerge from the soil in June and early July and feed for three to four weeks before laying eggs in the soil beneath the host plant. Eggs hatch in two to three weeks and the larvae feed on roots until late fall. With the onset of colder temperatures, larvae burrow deeper in the ground to overwinter. They resume feeding the following spring for a short while before they enter the pupal stage. Black vine weevils feed on a wide range of herbaceous and woody ornamentals. Preferred hosts are yew, hemlock, and various rhododendrons.

### Control:

Hand removal of weevils can be effective especially in small plantings or for individual plants. Insecticidal sprays can be used to treat for adult black weevils. Treatments should be made before egg laying occurs (**now**) and repeated twice at 2-week intervals. Soil drenches can also be applied from July to mid-October. For specific chemical recommendations, refer to the *2003 Illinois Commercial Landscape Turfgrass Pest and Management Handbook* (CLTPMH), for commercial applicators, and the *Home, Yard, and Garden Pest Guide* (HYGPG) for homeowners. Parasitic nematodes, *Steinernema feltiae* and *Heterorhabditis bacteriophora*, have been found to be effective in controlling black wine weevil larvae. They should be applied when larvae are present (in about five to seven weeks).

### Good websites:

<http://ohioline.osu.edu/hyg-fact/2000/2016.html>

[http://www.mortonarb.org/plantinfo/plantclinic/pest\\_blackvineweevil.pdf](http://www.mortonarb.org/plantinfo/plantclinic/pest_blackvineweevil.pdf)

## Oak Slug Sawfly



We've found oak slug sawfly (*Caliroa quercuscoccineae*) larvae feeding on pin oak (*Quercus palustris*). The larvae are about 12 mm (1/2 inch) long, pale yellow-green, and slimy (photo on left). The larvae eat one side of the leaf leaving the thin epidermis intact. This feeding creates a "window pane" look to the leaf (photo on right). Completely skeletonized oak leaves drop prematurely. Pin oak and scarlet oak are preferred hosts, but most oaks in the red oak family may be attacked. Normally, damage is an aesthetic problem.



#### Control:

This pest is generally kept in check by parasites, microbial disease, and other natural enemies. Even noticeable outbreaks are generally not dangerous to the health of the host oaks. If the window pane look doesn't appeal to your tastes there are chemical controls available. The University of Illinois states that many chemical insecticides used for caterpillar or beetle control will provide control.

#### Good website:

<http://www.fs.fed.us/na/morgantown/fhp/palerts/sawfly1.htm>

## Tilia Lace Bug

Tilia lace bug (*Gargaphia tilliae*) adults and young nymphs, and resultant feeding damage, were found on white basswood (*Tilia heterophylla*). Adult and nymphal Tilia lace bugs live on the lower surface of leaves and feed on leaf sap causing yellow and white stippling on the upper leaf surface. Heavy infestations may lead to complete stippling of the leaf and premature leaf drop. The undersides of leaves are covered with brown varnish-like excrement that look like black specks or tar spots.



Lace bugs overwinter as adults under loose bark of host plants and in leaf debris. Adults become active in late spring and females begin laying eggs around GDD 500 – 600. The eggs hatch about two weeks later. Adult lace bugs are three to six mm (1/8 to 1/4 inch) long with very ornate lace-like wings (photo on left). The nymphs are similar to adults in appearance but may appear darker.

Lace bug, spider mite and leafhopper damage appear very similar. Differentiation between the three critters is straight forward. There is webbing associated with spider mites, tar spots with lace bugs, and neither tar spots nor webbing with leafhoppers.

#### Control:

In most cases, lace bugs do not seriously harm plants so it is best to tolerate the damage where possible. According to The Ohio State University a hard jet of water (synergizing) applied to the leaf underside will dislodge young nymphs. The nymphs will often die before they find their way back to suitable leaves. **Synergizing should be done now.** If the lace bugs become intolerable, insecticidal soaps and sprays can be used and should be applied when nymphs are young (**now**). There are natural predators (e.g. lacewings, predaceous mites, assassin bugs, and spiders) that attack lace bugs; however, they generally do not appear in adequate numbers to offer sufficient control and their arrival is a tad late – after most of the damage has been done. Let's keep these natural predators around - insecticidal soaps are preferred over traditional chemicals since they are not as harmful to the "good guys". For specific chemical recommendations, refer to the CLTPMH or HYGPG.

#### Good websites:

<http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7428.html>

<http://ohioline.osu.edu/hyg-fact/2000/2150.html>



## Leaf Beetles

Leaf beetle larvae were found skeletonizing leaves of smooth sumac (*Rhus glabra*). The larvae were about six mm (1/4 inch) long, yellow with black legs (photo on right), and are voracious feeders. There are hundreds of kinds of leaf beetles and they are primarily aesthetic nuisances. Under normal circumstances damage from these pests is not detrimental to tree health.

### Control:

If there are extenuating circumstances (e.g. young trees, newly transplanted trees, or trees under stress from other factors) the bacterium *Bacillus thuringiensis* var. *tenebrionis* (M-Trak®) and insecticidal sprays, such as carbaryl and acephate, are listed as controls for leaf beetles. Applications should be made as soon as eggs hatch and larvae are small (**now**).



## Dutch Elm Disease

Brian Malatia, tree crew leader, found new Dutch elm disease (DED) infections on American elm (*Ulmus americana*). DED is caused by two closely related species of fungi: *Ophiostoma ulmi* (formerly known as *Ceratocystis ulmi*) and *O. novo-ulmi*. The American elm, *U. americana*, is extremely susceptible and the disease has killed hundreds of thousands of these elms across the U.S. All native elms are susceptible, Asian elms are resistant, and European elms are more or less in between.

There are two insect vectors responsible for transmitting DED: the native elm bark beetle (*Hylurgopinus rufipes*) and the European elm bark beetle (*Scolytus multistriatus*). The beetles carry the fungus to healthy trees as they feed on twigs and upper branches. Spores of the fungus cause the xylem to plug up and the tree to wilt. Beetles eventually lay their eggs in the bark of infected trees and tunneling larvae become coated with the fungus. The beetles typically have two generations per year in the Midwest and are present from late April through September.

DED can also be transmitted through root grafts. A network of roots allows the disease to move freely from one tree to the next and can result in a whole stand or parkway of trees becoming infected. Root grafts between trees are especially prevalent in cramped urban and suburban parkways.



Symptoms of new DED infections are yellowing, curling, and wilting of leaves on outer branches in the canopy. This is called “flagging” (photo on right). When the bark is removed, brown streaks can be found in the outer wood (photo on left). The fungus grows beyond the visible streaks and can rapidly spread to the trunk and kill the entire tree.



### Control:

Monitoring and sanitation are crucial to controlling DED. Elms should be inspected for flags weekly from now through July and every few weeks through September. If a tree is newly infected, pruning may successfully eradicate the disease if: 1) No more than 5% - 10% of the tree shows symptoms or, 2) At least seven to ten feet of clear wood occurs between the streaking and the main trunk. A final pruning cut, 7-10 feet beyond the streaks, is necessary to insure the fungus is removed. Sterilize pruning tools between cuts with 70% alcohol or a similar disinfectant. If a tree shows many flags or

completely wilts it must be removed quickly so that beetles and root grafts do not transmit the disease further. Root grafts should be severed before removal of a diseased tree. Girdling the tree by removing the bark/cambium in a strip near the base of the tree can be done temporarily before removal. Potential elm bark breeding material, such as elm logs and stumps with intact bark, should be chipped and destroyed, or at the very least, stripped of bark. A new biocontrol tool, Dutch Trig™, is available in Illinois experimentally and is effective, though, like most treatments including fungicides, it is not 100% effective. Valuable elms can also be injected with a fungicide. For further information about systemic fungicides that are probably the most reliable chemical control, refer to the CLTPMH or the HYGPG.

Plant resistant elm varieties. The Asiatic elms, lace bark elm (*U. parvifolia*) and Siberian elm (*U. pumila*), are highly resistant to the disease as are several hybrid selections including The Morton Arboretum's 'Accolade' elm.

Good websites:

[http://na.fs.fed.us/spfo/pubs/howtos/ht\\_ded/ht\\_ded.htm](http://na.fs.fed.us/spfo/pubs/howtos/ht_ded/ht_ded.htm)

[http://na.fs.fed.us/spfo/pubs/howtos/ht\\_save/ht\\_save.htm](http://na.fs.fed.us/spfo/pubs/howtos/ht_save/ht_save.htm)

<http://www.ag.uiuc.edu/~vista/abstracts/a647.html>

[http://www.mortonarb.org/plantinfo/plantclinic/diseases\\_dutchelm.pdf](http://www.mortonarb.org/plantinfo/plantclinic/diseases_dutchelm.pdf)

## Oak Wilt

Our tree crew found bronzed, wilted leaves of oak wilt on red oak (*Quercus rubrum*) in our east woods. The causal fungus, *Ceratocystis fagacearum*, invades the xylem and induces the tree to clog its own vessels. Water flow is stopped and dying cells appear. Oak wilt can spread from infected trees to healthy trees through root grafts and by insects, especially picnic beetles, that carry spores of the fungus from one tree to another as they feed and visit wounds.

Both the red and white oak groups are susceptible to oak wilt though, the former is most susceptible. Symptoms between the two groups are different. In red oaks death is rapid with wilt symptoms starting at the top of the tree and progressing inward and downward on the lateral branches within a few weeks. Near complete leaf drop usually occurs by the middle of summer making infected trees stand out. Leaves turn grayish-green and brown beginning at the tip and margin (photo on right). There is



profuse suckering at the base of the tree. If an infected branch is cut in cross section, or bark peeled back, brown streaking symptoms can be seen in the outer ring of sapwood (photo on left). Symptoms of the disease on white oaks are similar, but spread more slowly, may stay localized on individual branches, and complete defoliation does not occur. Trees infected for two years or more develop isolated dead branches in the crown, creating a "stag-head" appearance.



Control:

Monitoring and rapid removal (sanitation) is key to controlling oak wilt.

Remove trees as soon as you confirm the disease. Vector insects feed on fresh pruning wounds, so oaks should not be pruned during the growing season when the nitidulid beetles are active. Because the disease can spread to other healthy oaks about 25 to 50 feet away (depending on tree size) via root grafts, digging a trench to a depth of approximately three feet between infected and healthy trees will break root grafting and help halt the spread. Some systemic fungicides are labeled for controlling this disease. Refer to the CLTPMH or the HYGPG.

Good websites:

[http://www.mortonarb.org/plantinfo/plantclinic/diseases\\_oakwilt.pdf](http://www.mortonarb.org/plantinfo/plantclinic/diseases_oakwilt.pdf)

[http://na.fs.fed.us/spfo/pubs/howtos/ht\\_oaklab/toc.htm](http://na.fs.fed.us/spfo/pubs/howtos/ht_oaklab/toc.htm)

<http://www.ag.uiuc.edu/~vista/abstracts/a618.html>

## Sphaeropsis Tip Blight

We found initial symptoms on current year's needles of Sphaeropsis tip blight (Diplodia tip blight) on Scots pine (*Pinus sylvestris*). Sphaeropsis is a frequent disease of two- and three-needle pines. The fungus infects needles as they are expanding, causing stunted needles that turn straw or brown colored (photo below). Some "bleeding" or resin may appear dripping from infected needles.



The disease frequently starts on lower branches and is spread upwards by splashing rain and air currents. Black pepper-like fruiting bodies will form at the base of the needles (look underneath the needle sheath) a number of weeks after the needles die. Dead shoot tips and needles from previous years can also be found on large trees. The fungus may also invade woody tissue and cause whole branches to die.

### Control:

Some species are so susceptible (i.e. red, Austrian, mugo, and Scots pines) that there is little you can do to prevent the disease. Keeping trees healthy through good management and raking up infected cones and needles may help a little. Keep trees mulched and watered during dry periods. Avoid overhead irrigation, which helps spread spores, and don't prune susceptible trees in wet weather. As soon as tip blight is noticed, prune out and destroy diseased twigs and discard cones (they may also harbor overwintering inoculum) and needles that have fallen to the ground. Sterilize tools between pruning cuts. Chemical control is effective and is used commonly in nurseries and plantations. Refer to the CLTPMH or HYGPG for specific recommendations.

In the future, plant alternative species in your landscape.

Good websites:

<http://www.ag.uiuc.edu/~vista/abstracts/aSPHAERO.HTML>

<http://na.fs.fed.us/spfo/pubs/factsheets/sphaeropsis/shootblight.htm>

[http://www.mortonarb.org/plantinfo/plantclinic/diseases\\_sphaeropsis.pdf](http://www.mortonarb.org/plantinfo/plantclinic/diseases_sphaeropsis.pdf)

## Powdery Mildew

Powdery mildew is appearing on the leaves of Illinois ninebark (*Physocarpus intermedius*) and roses (*Rosa spp.*). Warm, humid, but rain-free days favor this fungal disease. Hundreds of plant species are susceptible to powdery mildew but the disease is host specific and many different fungal species cause it. Thus, infection of one plant species is unlikely spread to a different, unrelated species.

Powdery mildew appears as a superficial white to gray coating over leaf surfaces, stems, flowers (photo on right), or fruit of affected plants. Initially, discrete circular powdery white spots appear. These spots coalesce producing a continuous patch of mildew. Leaf curling and twisting result and in severe infestations, you may see premature defoliation and deformed flower buds. Though unsightly, powdery mildew is usually not a fatal disease in the landscape.





#### Control:

Infected plant parts should be removed as soon as symptoms appear. Rake fallen leaves and do not handle plants when foliage is wet. Direct watering of foliage can lessen infections. Water plants during periods of drought and avoid overhead watering, that creates high humidity, in late afternoon or evening. Plant in locations where there is good soil drainage, sufficient sunlight (for ninebark, this is at least six hours daily) and space plants 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 CLTPMH or HYGPG.

In the future, plant resistant cultivars and species.

#### Good websites:

<http://www.ianr.unl.edu/pubs/plantdisease/g1321.htm>

<http://ohioline.osu.edu/hyg-fact/3000/3047.html>

[http://www.mortonarb.org/plantinfo/plantclinic/diseases\\_powderymildews.pdf](http://www.mortonarb.org/plantinfo/plantclinic/diseases_powderymildews.pdf)

## Rose Rust



We're finding rose rust on *Rosa* sp. leaves. Bright orange "powder" emanated from the leaves (photo on left). This powder is actually aeciospores of rose rust fungus (*Phragmidium* sp.). The 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, while shoots may become distorted and turn reddish. Plants infected by this fungus will decline in vigor.

#### Control:

Infected plant parts should be pruned out and destroyed. Don't work with the plants in wet weather and provide ample air circulation in plantings. Plant resistant roses. Teas roses are considered highly resistant, while hybrid teas, ramblers, and polyantha types are moderately resistant. For chemical control, refer to the CLTPMH or HYGPG.

#### Good websites:

<http://ohioline.osu.edu/hyg-fact/3000/3063.html>

## Crown Gall



Crown gall was found on yellow and wilting leaves of big-leaved euonymus (*Euonymus fortunei* 'Vegetus'). Crown gall has a wide host range and attacks both woody and herbaceous plants, but is very common on euonymus. It is caused by several strains of a bacterium, *Agrobacterium tumefaciens*, that form brown, woody tumors and galls that girdle stems (photo on left). The galls appear near the soil line in euonymus. The bacteria overwinter in plant tissues and soil and not surprisingly, the disease is spread by soil or by rain splash.

#### Control:

Prune out and destroy infected plant parts. Seriously infected plants should be removed and destroyed. As the bacteria must enter the plants through wounds, avoid wounding stems and roots.

An *Agrobacterium radiobacter* strain K1026 (a different bacterial species) has been successfully used to prevent crown gall. The U.S. EPA has approved the use of K1026 as a cutting dip during propagation. It is being sold as NOGALL. In orchards and vineyards production and testing of several other *Agrobacterium* strains are in the pipeline to control crown gall.

#### Good websites:

<http://ohioline.osu.edu/hyg-fact/3000/3054.html>

<http://www.ag.uiuc.edu/~vista/abstracts/a1006.html>

## Guignardia

The initial stages of Guignardia leaf blotch were found on Ohio buckeye (*Aesculus glabra*). Right now we're seeing reddish brown to brown lesions with a yellow border that blends into the normal green leaf tissue (photo below). Upon closer inspection with a hand lens dark pycnidia (fungal fruiting bodies), that look like black pepper, occur on the lesions on the upper leaf surface. The blotches will enlarge, coalesce, and may cover the leaf by the end of summer. Premature defoliation may follow.



#### Control:

This disease eventually decreases a tree's ability to photosynthesize, and is unsightly, but the damage is minimal in landscapes. It can be a major problem in nurseries. We know of no chemical treatment. Pruning trees to improve air flow may help since the spores are spread and germinate under moist to wet conditions. We have been rating *Aesculus* species for resistance to this disease on the Arboretum grounds. In addition to *A. parviflora* being resistant, *A. turbinata* and select *A. glabra* individuals have been faring well.

## Guignardia Bidwellii (Black Rot)

Black rot caused by the fungus, *Guignardia bidwellii*, was found on leaves of Amur grape (*Vitis amurensis*). On the upper surface of leaves, circular to angular brown lesions about 12 mm (1/2 inch) in diameter and surrounded by dark brown margins developed. The lesions are studded with tiny black fungal fruiting bodies (pycnidia). Lesions coalesce and form irregular reddish brown blotches similar to those on buckeyes.

Fruit infection occurs when the fruit is half to nearly full size and will show symptoms ranging from small, brown, decayed spots to completely rotted, black, shriveled fruits (mummies). The fungus also infects tendrils, leaf petioles, and canes.

The fungi overwinters in infected canes and in last year's mummies. In the spring, spores are carried by wind and rain to succulent leaves and infections occur during periods of prolonged wet weather.

#### Control:

Proper cultural practices need to be implemented, such as plant spacing, site selection, mulching, pruning, and removing mummies, to help contain this disease. Fungicides are also important for disease control on fruit. According to the University of Illinois (UI): "Thorough coverage of all plant parts above ground with each application is essential for control of the disease." Application should target: New shoots about 1/2 inch long, and should be repeated at 7-14 days



intervals as well as just before and after bloom. The sprays can be discontinued when the weather turns dry. See <http://www.ag.uiuc.edu/~vista/abstracts/aGRAPE.HTML> for further information regarding cultural and chemical controls.

## Witches Broom on Hackberry



Witches' brooms were found on hackberry (*Celtis occidentalis*). This is a common, disfiguring disease of hackberry, caused by two organisms working together: a powdery mildew fungus and an eriophyid mite. Each broom is a compact cluster of twigs, caused by the repeated killing of twigs (photo on left).

### Control:

Pruning out the brooms is of limited value unless done before many brooms have developed. The brooms don't seem to hurt the tree, but are unsightly. Chinese hackberry (*Celtis sinensis*) and Jesso hackberry (*Celtis jessoensis*) are resistant.

## What's our Plant Clinic Seeing?

### Elm Leaf Tatter



We have been getting many reports of tattered elm (photo on left) and oak leaves this spring. The damage on both closely resembles insect damage. The frost that occurred on May 3<sup>rd</sup> when the temperature at the Arboretum dropped to -3 °C (26 °F) combined with the strong winds we have experienced this spring are the culprits behind leaf tatter. Succulent and emerging leaves are most susceptible and injury often isn't noticed until the leaves fully expand. Uneven growth of leaf cells results in the characteristic tattered appearance of the leaf. Tatter usually does not seriously harm ornamental trees.

## What to Look for Next Week

Next week we will be looking for two-marked treehoppers, verticillium wilt, cottony maple scale, and spiny elm caterpillars.

## Synopsis of Home, Yard and Garden Newsletter

The Home, Yard and Garden Pest Newsletter from the University of Illinois discusses verticillium wilt, rhododendron root rot, bagworms, and root rots. The newsletter also announces the upcoming Sixth Annual Greenhouse Management Workshop. The workshop will be held August 12, 2004, in Bloomington at the University of Illinois Extension office, 402 North Hershey Road. The workshop is scheduled from 9 a.m. to 4 p.m. The registration cost is \$30 per person for Illinois Greenhouse Association members and \$45 per person for nonmembers.

<http://www.ag.uiuc.edu/cespubs/hyg/html/>



*“Let us spend one day as deliberately as Nature.”*  
*Henry David Thoreau*

The Plant Health Care Report is prepared by Cindy Terrell of The Morton Arboretum, edited by Karel Jacobs, Ph.D., Plant Pathologist at The Morton Arboretum and reviewed by Fredric Miller, Ph.D., Research Associate, Entomology at The Morton Arboretum. Donna Danielson of The Morton Arboretum performed scouting and assisted in diagnostics. 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.

The CLTPMH and the HYGPG, from the University of Illinois, are available by calling (800-345-6087). You may also purchase them online at <http://webstore.aces.uiuc.edu/shopsite/browsecommhort.html>. One further source is your local county extension office.

The Plant Health Care program is partially funded by grants from the Illinois Arborist Association (<http://www.illinoisarborist.org/>) and the Illinois Landscape Contractors Association (<http://www.ilca.net/>).

This report can be viewed on-line at The Morton Arboretum website at <http://www.mortonarb.org/plantinfo/plantclinic/phc/index.html>.

Questions about pests and diseases should be directed to our Plant Clinic. Plant Clinic hours are 1 - 4 pm Monday through Friday (Tel. 630-719-2424) and 10-1 pm Saturdays (walk-ins only).

Please direct inquiries or comments about the PHC reports to Cindy Terrell (<mailto:cterrell@mortonarb.org>).

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