

# Plant Health Care Report

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Scouting Report of The Morton Arboretum

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**April 16, 2010**

**Issue 2010.02**

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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?

*Amelanchier grandiflora* 'Autumn Brilliance' (Figure 1)

**Accumulated Growing Degree Days (Base 50): 109**

**Accumulated Growing Degree Days (Base 30): 710**

### Insects

- Euonymus scale on Daphne
- Eastern tent caterpillar on Cotoneaster
- Hemlock rust mite
- Spruce needleminer

### Diseases

- Verticillium wilt on Magnolia
- Cedar apple and hawthorn rusts
- Cryptodiaporthe canker on dogwood

### Weekly reminder

#### What to look for next week

**Fungus of the week:** Jelly fungus (*Exidia glandulosa*)

**How to use the accession numbers and grid locations to find the plants at The Morton Arboretum**

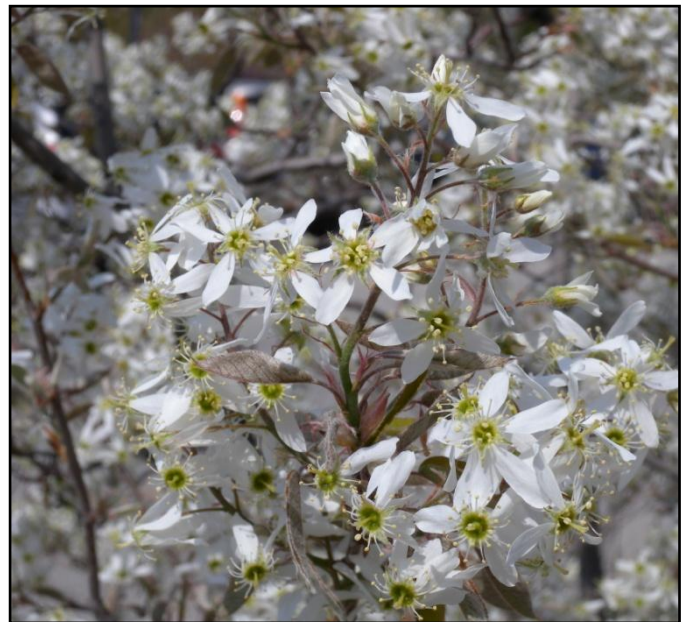


Figure 1 *Amelanchier grandiflora* 'Autumn Brilliance'

## Degree Days and Weather Information

As of April 14, 2010, we are at 109 growing degree days, which is approximately ten calendar days ahead of the historical average (1937-2009) and twenty-one calendar days ahead of last year.

| Location                                   | Growing Degree Days through April 14 | Precipitation between April 4-14 in inches |
|--------------------------------------------|--------------------------------------|--------------------------------------------|
| The Morton Arboretum (Lisle, IL)           | 109                                  | 1.49                                       |
| Chicago Botanic Garden (Glencoe, IL)*      | 101                                  | 0.25                                       |
| Chicago O'Hare Airport*                    | 119                                  | 0.51                                       |
| Aurora, IL**                               | 127.6                                |                                            |
| Champaign, IL**                            | 175.5                                |                                            |
| DuPage County Airport (West Chicago, IL)** | 123.4                                |                                            |
| Decatur, IL**                              | 187.5                                |                                            |
| Moline, IL**                               | 160.9                                |                                            |
| Peoria, IL**                               | 191.1                                |                                            |
| Quincy, IL**                               | 196.1                                |                                            |
| Rockford, IL**                             | 116.1                                |                                            |
| Waukegan, IL**                             | 75.5                                 |                                            |
| Wheeling, IL**                             | 96                                   |                                            |

\*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>

## This Week's Sightings...

### *Euonymus* scale on *Daphne*



Figure 2 *Euonymus* scale adults and nymphs

*Euonymus* scale (*Unaspis euonymi*) males and females have been found on *Daphne alpina* (670-79\*1; AA-32/31-67). Infested leaves develop small yellow or white spots and heavy infestations can cause complete defoliation or even plant death. *Euonymus* (*Euonymus* spp.) and pachysandra (*Pachysandra* spp.) are the principle hosts.

*Euonymus* scale overwinter as mated females on plant stems (Figure 2). Eggs develop beneath the scale and hatch during late spring. The crawlers move to new succulent leaves to feed on plant sap. As the crawlers mature they secrete a waxy protective coating or "armor". Adult females are dark brown or gray, about 2 mm (1/12 inch) long, and shaped like an oystershell. Males are smaller, narrow and white (Figure 3). There are usually two generations per year in our area. The second generation hatches in late July or early August.

**Control:** Heavy infestations should be pruned out. For chemical recommendations, refer to the *Commercial Landscape and Turfgrass Pest Management Handbook 2007* (CPM) if you are a commercial applicator or *Home, Yard and Garden Pest Guide* (HYG) from the University of Illinois if you are a homeowner. According to the CPM chemicals should be applied in June, or when there are active crawlers. A total of four applications will need to be applied to get control of an infestation.

Additional reading: <http://www.agnr.umd.edu/users/hgic/pubs/online/hg48.pdf>  
[http://www.mortonarb.org/plantinfo/plantclinic/pests\\_scaleinsects.pdf](http://www.mortonarb.org/plantinfo/plantclinic/pests_scaleinsects.pdf)

## Eastern tent caterpillar

Eastern tent caterpillars (*Malacosoma americanum*) have been found on hedge cotoneaster (*Cotoneaster lucida*) (700-80\*2; EE-69/33-94) (Figure 3) at The Morton Arboretum this week. The caterpillars ultimately grow to two inches long and are hairy with white stripes down their backs and blue spots between longitudinal yellow lines. The larvae gather at a fork in a tree and build a web or “tent”. They leave the web to feed during the day, but return at night. Since they create a strand of silk wherever they go, the web enlarges as the caterpillars eat. Severe defoliation only occurs when populations are high.

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



Figure 3 Eastern tent caterpillars (*Malacosoma americanum*)

**Control:** The safest way to control the caterpillar is by tearing out or pruning out the webs. This should be done on cloudy or rainy days or at night when the caterpillars are in the nest and not out feeding. Another option is to remove the overwintering egg masses before spring if you can find them (good luck with that – we’ve tried it and it isn’t easy). The egg masses are dark gray to black and are wrapped around twigs that are about the diameter of a pencil. *Bacillus thuringiensis* var. *kurstaki* (Bt) can also be sprayed on young larvae but will not kill mature larvae. For chemical control, refer to the *Commercial Landscape and Turfgrass Pest Management Handbook 2010* (CPM) if you are a commercial applicator or *Home, Yard & Garden Pest Guide* (HYG) from the University of Illinois if you are a homeowner.

Additional reading: <http://www.ca.uky.edu/entomology/entfacts/ef423.asp>  
<http://www.ag.ohio-state.edu/~ohioline/hyg-fact/2000/2022.html>

## Hemlock rust mites



Figure 4 Hemlock rust mite

Hemlock rust mites (*Nalepella tsugifolia*), an eriophyid mite, have been found on Eastern hemlock (*Tsuga canadensis*) (836-66\*1; D-47/40-95) (Figure 4). Rust mites suck the juices from conifer needles, causing the infested needles to turn yellow then brown. If the infestation is severe, mite-ridden needles will drop off the tree. The mites themselves are cigar-shaped, pale yellow, about the size of dust, and can only be viewed using a strong hand lens or dissecting scope. These cool season mites may also attack fir, yew, and spruce.

**Control:** We are unaware of any cultural controls. For severe infestations, insecticidal soaps, summer oils, or miticides should be applied after eggs hatch, which is usually when saucer magnolia is in the pink bud stage. For further information on chemical controls refer to the CPM or HYG.

Additional reading: <http://www.entomology.umn.edu/cues/Web/146HemlockRustMite.pdf>

## Spruce Needleminer

Overwintering spruce needleminer (*Endothenia albolineana*) larvae are active and are feeding on spruce (*Picea* spp.) (Figure 5). Infested needles have turned yellow (photo on right) and have round entry holes at their bases.

Larvae overwinter in nests formed from silk, dead mined needles and frass (Figure 6). In early spring, they emerge and begin mining needles until pupation in mid-May. Adult moths emerge in June, and the females lay pale green eggs at the base of needles. Typically in July, larvae hatch and begin mining and hollowing out needles; this feeding continues until frost. Each larva is capable of eating the insides of up to ten needles. Needleminers usually attack Norway, white, and Colorado spruces growing under adverse conditions in the upper Midwest. Infestations and damage is usually minor.

**Control:** To reduce the current year's infestation, wash away the nests with a forceful stream of water now. Gather and discard the resulting debris.



Figure 5 Spruce needleminer



Figure 6 Spruce needleminer symptoms

## *Verticillium* wilt

We are seeing the first symptoms of *Verticillium* wilt on Leonard Messel Loebner's Magnolia (*Magnolia x loebneri* 'Leonard Messel') (1345-2004; J-52/31-91) in the Children's Garden (Figure 7). The branch of the magnolia we saw were not producing flowers and leaves like their healthy counterparts. When we scraped the bark off the branch, we saw the characteristic light brown streaks in the sapwood (Figure 8). *Verticillium* wilt is a fungal disease that affects over 300 herbaceous and woody plants. The disease is caused by many host-specific strains of two soil-borne fungi, *Verticillium albo-atrum* and *V. dahliae*. *Verticillium dahliae* is believed to be the predominant species attacking trees in the Midwest. The disease attacks many herbaceous plants as well as woody plants and has both acute and chronic (long-term) modes of action.



Figure 7 Healthy magnolia (left) and magnolia with *Verticillium* wilt (right)

This is a soil-borne disease in which overwintering microsclerotia (microscopic asexual structures that are capable of surviving harsh environmental conditions) remain in the soil in a type of dormancy until unsuspecting roots cross their path. The fungus enters the root through wounds or direct penetration. Once inside a root, the fungus colonizes water-conducting tissue (xylem) and gradually spreads upward through the plant. The fungus produces toxins that cause the plant to block off the xylem in an attempt to limit the growth of the fungus. This also cuts off the flow of water which results in leaf wilting, yellowing and browning, branch dieback, and often plant death. The wood beneath the bark is streaked in many species because of the "plugging" response.

Typically when a wilting branch is cut in cross section, or the bark peeled back, brown streaks can be seen in the outer ring of sapwood. Not all plants, including ash and Japanese tree lilac, will show streaking.

*Verticillium* can be a chronic problem, that is, killing a branch or two annually, or it can kill the whole plant in one season. Chronic (long-term) symptoms may also appear such as: stunted, chlorotic, and deformed foliage; slow growth; and abnormal seed production. *Verticillium* can be spread to new plants and soils by seeds, tools, irrigation furrows, and the soil and roots of new transplants and nursery stock. Once the fungus is introduced into soil it can survive for several years as microscopic microsclerotia, even in unfavorable conditions.

Too often, arborists assume a maple with wilting branches is infected with *verticillium*, but a culture lab should be used to verify the diagnosis. In case the tree dies and needs to be replaced, you want to replace it with a tree resistant to the fungus.

**Control:** *Verticillium* wilt is difficult to control because of the pathogen's ability to survive in the soil with or without a host plant. Fungicides are ineffective in controlling *Verticillium*. The best course of action is sanitation and prevention. Dead branches should be pruned out as they occur to help overall plant vigor. Because the disease can be transmitted via sap, sterilize pruning tools with 70% alcohol (or a similar disinfectant) between cuts. Remove chronically infected trees.

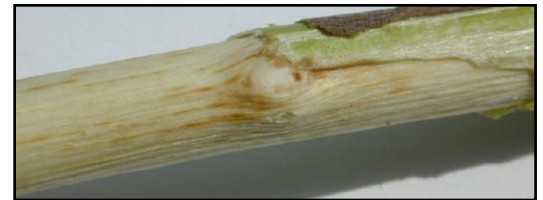


Figure 8 Vascular streaking symptom of *Verticillium* wilt

**Other control measures:**

- Start with clean plant materials and soil.
- Plant trees in sites that are appropriate for the plant.
- Water during dry periods. But do not overwater since the lower soil temperature may hasten disease in addition to creating plant stress.
- Use a three to four inch layer of organic mulch to retain moisture and prevent soil temperature fluctuation.
- Do not over fertilize. Maintain a balanced fertility and use an ammonium or urea source of nitrogen. Unbalanced nitrogen (too high or too low), too low potassium and too low phosphorous can lead to more disease. Nitrate sources of nitrogen have been correlated with the disease.
- Remove susceptible plants and plant debris or they will act as reservoirs of the fungus and increase the inoculum "load" of the soil.
- Avoid injuries to the roots, trunk, and branches.
- Plant resistant varieties.
- Remove severely infected trees and replace with plants that are not susceptible to *Verticillium*.

Some species with reported *Verticillium* resistance include:

|              |                                   |              |
|--------------|-----------------------------------|--------------|
| arborvitae   | hazelnut                          | pine         |
| bald cypress | hickory                           | rhododendron |
| beech        | holly                             | spruce       |
| birch        | honey locust                      | sweetgum     |
| boxwood      | hornbeam                          | sycamore     |
| crabapple    | ironwood                          | walnut       |
| dogwood      | Katsuratree                       | willow       |
| ginkgo       | red maple cultivars: 'Armstrong', | yew          |
| hackberry    | 'Autumn Flame', 'Bowhall',        | zelkova      |
| hawthorn     | 'October Glory', 'Red Sunset',    |              |
|              | 'Scarlet', and 'Schlessinger'     |              |

Additional reading: <http://www.ipm.iastate.edu/ipm/hortnews/1998/3-13-1998/verticil.html>  
<http://ohioline.ag.ohio-state.edu/hyg-fact/3000/3053.html>  
<http://www.extension.umn.edu/distribution/horticulture/DG1164.html>

## Cedar Apple and Hawthorn Rusts

Telial horns are just beginning to emerge from cedar-apple (Figure 9) and –hawthorn (Figure 10) rust galls on Eastern red cedar (*Juniperus virginiana*). The fungi causing cedar-apple and -hawthorn rusts (*Gymnosporangium juniperi-virginianae* and *Gymnosporangium globosum*, respectively) complete their life cycles on two different hosts, alternating between *Juniperus* species (such as red cedar or ornamental junipers) and *Malus* species, (eg. apple and crabapple), or *Crataegus* species (hawthorn). In spring, the brown galls (about 10-30 mm (0.39-1.18 in.) in diameter for apple rust, and about 3-15 mm (0.11-0.59 in.) for hawthorn rust) that formed the prior year begin to swell and produce orange, gelatinous tendrils (telial horns). At present, the telial horns are only about 3 mm (0.11 in.) long. The horns will elongate to up to 50 mm (2 in.) and release spores especially during dry, windy weather that follows spring rains. The spores (one of four different spore types formed by this fungus) are then blown to the apple or crabapple hosts when leaves are young (four to eight days old) and most susceptible to infection.



Figure 9 Telial horns of a cedar-apple rust gall

**Control:** The best control is to plant resistant cultivars or varieties of *Malus* and *Crataegus*. It is also helpful to remove one of the two host plants if they are in close proximity and avoid planting the alternate hosts near each other. You can also physically prune galls from the twigs of the juniper host. This is only effective if a few plants are lightly infected. Be sure to consider whether a cultivar or variety is resistant to other diseases. The following crabapples and hawthorns have been found to be resistant to cedar-apple and –hawthorn rust:

### Cedar-apple rust resistant crabapples (*Malus*)

|                  |                                        |
|------------------|----------------------------------------|
| 'Adams'*         | 'Profusion'                            |
| 'Beverly'        | 'Professor Sprenger'*                  |
| 'Bob White'      | 'Red Jewel'                            |
| 'Coralburst'     | <i>M. baccata</i> 'David'              |
| 'Donald Wyman'*  | <i>M. baccata</i> 'Jackii'*            |
| 'Dolgo'          | <i>M. floribunda</i> *                 |
| 'Indian Magic'   | <i>M. sargentii</i>                    |
| 'Indian Summer'* | <i>M. sargentii</i> cv. 'Tina'         |
| 'Liset'*         | <i>M. zumi</i> var. <i>calocarpa</i> * |
| 'Prairifire'*    |                                        |

\* also shows resistance to apple scab, powdery mildew, and fireblight

### Cedar-hawthorn rust resistant hawthorns (*Crataegus*)

|                                              |                              |
|----------------------------------------------|------------------------------|
| <i>Crataegus phaenopyrum</i>                 | <i>C. pruinosa</i>           |
| <i>C. viridis</i> 'Winter King'              | <i>C. douglasii</i>          |
| <i>C. crus-gallis</i>                        | <i>C. pentagyna</i>          |
| <i>C. crus –gallis</i> var. <i>inverness</i> | <i>C. sanguine</i>           |
| (thornless)                                  | <i>C. pseudoheterophylla</i> |
| <i>C. altaica</i>                            | <i>C. calpodendron</i>       |
| <i>C. marshallii</i>                         |                              |

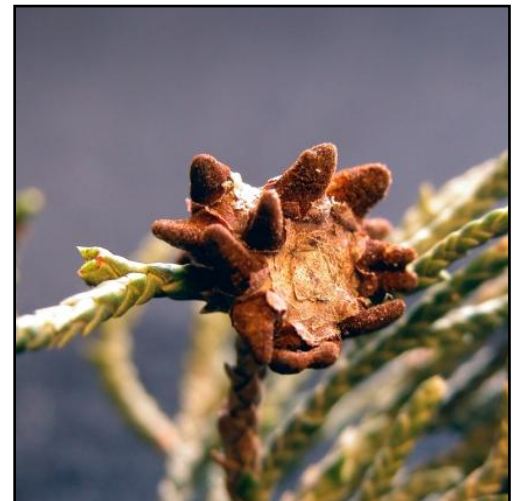


Figure 10 Telial horns of a cedar-hawthorn rust gall

The above list is by no means all-inclusive; there are hundreds of crabapple cultivars. For other resistant cultivars, see [http://www.mortonarb.org/index.php?option=com\\_content&view=article&id=858&Itemid=6](http://www.mortonarb.org/index.php?option=com_content&view=article&id=858&Itemid=6)

For chemical recommendations on the *Malus* and *Crataegus* host, refer to the CLTPMH or the HYGPG.

Additional information can be found at the following websites:

<http://www.mortonarb.org/component/content/article/193-insects-diseases/733-cedar-apple-and-related-rust-diseases.html>

<http://urbanext.illinois.edu/focus/cedarhawthornrust.cfm>

## ***Cryptodiaporthe* Canker**

Golden canker caused by the fungus, *Cryptodiaporthe corni*, was found on pagoda dogwood (*Cornus alternifolia*). The infected branches were golden-yellow (Figure 11) and speckled with orange fungal fruiting bodies (Figure 12). Other symptoms include wilting and death of leaves on infected branches, followed by branch dieback. This fungus can be fatal if the main trunk of a tree becomes infected. We have also seen golden canker on giant dogwood (*Cornus controversa*) in previous years.



Figure 11 Red-brown healthy branches of pagoda dogwood (*Cornus alternifolia*) compared to the light tan color of the branch infected with *Cryptodiaporthe corni*



Figure 12 Orange fungal fruiting bodies of *Cryptodiaporthe* canker

### **Control:**

The best control is prevention. *Cryptodiaporthe* canker is often the result of a stressed plant, so mulching and watering your plant can help prevent the initial infection. Prune the cankered branches during dry weather four to six inches below the discolored bark. The infected branches are the source of spores (inoculum). To prevent spread of the fungus, don't forget to disinfect pruning tools after each cut by dipping them in alcohol.

## **Weekly Reminder:**

When pruning your azaleas (Figure 13) and rhododendrons be sure to only remove the wilted flower, otherwise you may risk damaging next year's buds, which would result in a lack of flowering next year. For more information on how to prune rhododendrons visit the American Rhododendron Society website:

<http://www.rhododendron.org/v47n2p79.htm>



Figure 13 *Rhododendron* 'P.J.M. Compacta'

## What to Look for in the Next Two Weeks:

We will be looking for spruce spider mite, ash plant bug, *Cytospora* canker, cedar-quince rust, honeylocust plant bug, seasonal needle drop, and larch casebearers.

## Fungus of the week: *Exidia glandulosa*



Figure 14 Hydrated *Exidia glandulosa* on a dead elm branch



Figure 15 Dry *Exidia glandulosa* on a dead elm branch

After wet periods the jelly fungus, *Exidia glandulosa*, can best be described as a gelatinous mass of slimy blobs (Figure 14). This saprophyte, an organism that gets its nutrients from dead or dying organic matter, is commonly found on dead branches of hardwood trees (oak, elm, willow, etc.). When fully expanded it is 9.52- 19.05 mm (3/8-3/4 inch), but often many mushrooms grow together making it appear much larger. When the thallus, the body, dries up it shrinks significantly and looks like a small black crust on the branch (Figure 15). David Arora states in his book *Mushrooms Demystified*, that the edibility status is, "Unknown, and like most of us, likely to remain so." Once you touch this slimy specimen you'll want to question the texture before putting it in your mouth.

## How to use the accession numbers and grid locations to find the plants at The Morton Arboretum

The accession numbers and the grid locations of some of the reported plants have been recently included in the PHC Report so readers will be able to come to The Arboretum and find the plants, and see what the insect or disease problem looks like first hand. This was done because many people are hands-on learners and find it difficult to learn from photos and descriptions.

To learn how to use the accession number and grid location, get an Arboretum map, and learn how to read the tree tags please go to our website: <http://www.mortonarb.org/tree-collections.html>. Our friendly and knowledgeable staff in the Visitor's Center and Plant Clinic can also help you.



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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, which is published in the book *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 Knophf, Inc. ISBN: 0-394-51992-2

Arora, David. 1986. *Mushrooms Demystified 2<sup>nd</sup> 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](mailto:plantclinic@mortonarb.org). Inquiries or comments about the PHC reports should be directed to Stephanie Adams at [sadams@mortonarb.org](mailto:sadams@mortonarb.org).

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