

Plant Health Care Report

Scouting Report of The Morton Arboretum

May 1– May 7, 2009

Issue 2009.04

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?

Redbuds (*Cercis canadensis*) are in full-bloom.

Accumulated Growing Degree Days (Base 50):116.5



Insects

- Gypsy moth
- European elm flea weevil
- Juniper webworm
- Spruce needleminer

Diseases

- Cedar rusts

Sightings Elsewhere

- Tulip fire

Weed Note

- Shepherd's purse
- Henbit

Degree Days and Weather Information

As of May 7, 2009 we were at 116.5 growing degree days. The historical average (1937-2008) for the same date is 201 degree days. Last year we were at 178 growing degree days on May 7.

Location	Growing Degree Days through May 7	Precipitation between May 1 to May 7 in inches
The Morton Arboretum (Lisle, IL)	116.5	1.05
Chicago Botanic Garden (Glencoe, IL)*	91	.56
Chicago O-Hare Airport*	109.5	.67
Aurora, IL	117	
Champaign, IL	239.1	
DuPage County Airport (West Chicago, IL)	155.3	
Decatur, IL	262.4	
Moline, IL	177.4	
Peoria, IL	221	
Quincy, IL	271.9	
Rockford, IL	134.6	
Waukegan, IL	76	
Wheeling, IL	110.5	

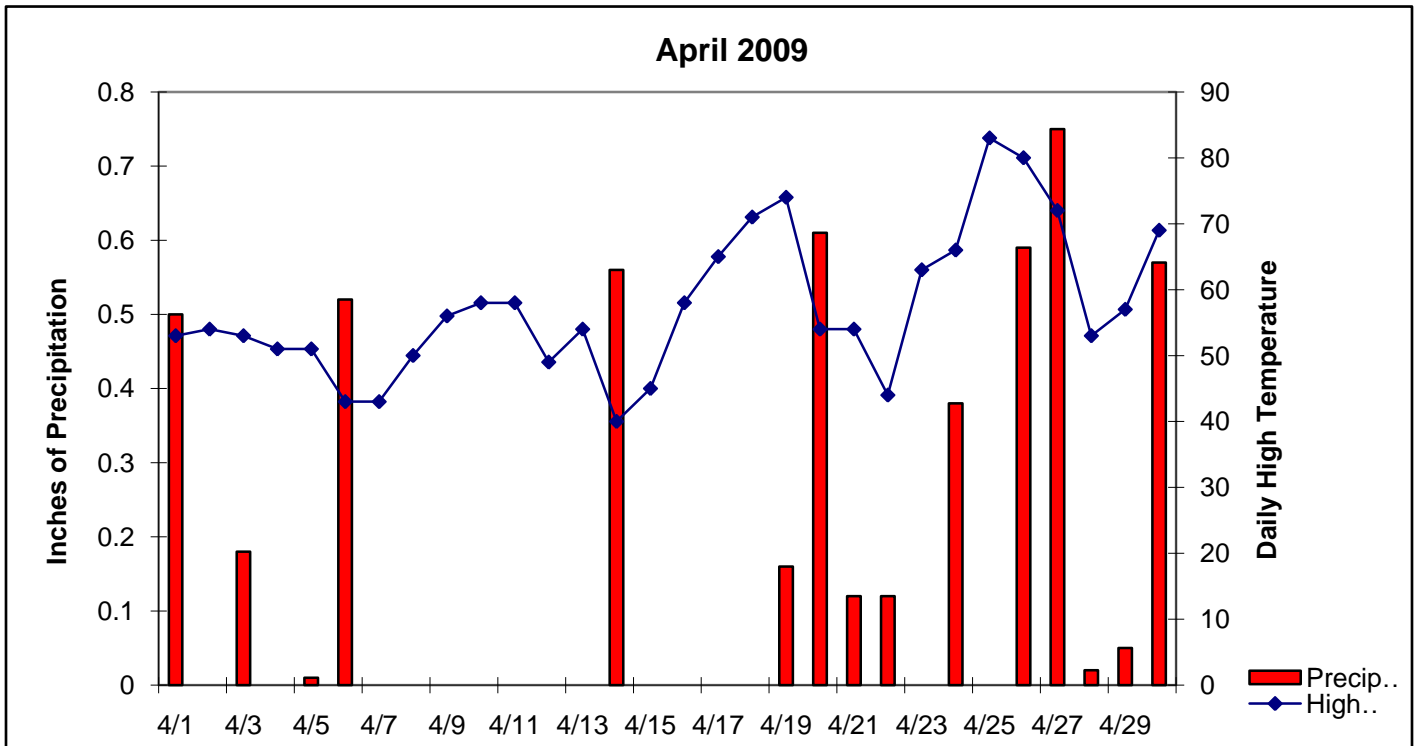
**Thank you to Mike Brouillard, Green Living, Inc., and Chris Yooning, Chicago Botanic Garden, for supplying us with this information.*

April Weather

Our April weather was cooler than the average. The average temperature was 3.5 degrees cooler than our historical average (1937-2008). It was much wetter with 1.51 inches more of rainfall than in the average April. The chart on the next page provides daily precipitation and temperature highs for April.

Summary of April Temperature and Precipitation Data

	April 2009
Average Daily Temperature	46.4° F
Historical Avg. Daily Temp.	49.9° F
High Temperature	83.0° F
Low Temperature	25.0° F
Total Precipitation	5.14 in.
Historical Avg. Precipitation	3.63 in.
Total Days with Precipitation	15



This Week's Sightings

Gypsy moth



Gypsy moth larvae have hatched on our grounds. Gypsy moth caterpillars are serious defoliators that feed on over 450 species of trees and shrubs. A mature caterpillar can eat one square foot of foliage per day. Their favorite trees are oak, crabapple, birch, linden, willow, and hawthorn. Although deciduous trees that are defoliated can put out a new set of leaves, the trees use a lot of resources to do so. Trees that are severely defoliated (approximately greater than 50%) several years in a row may die. Severe defoliation also makes trees more susceptible to other problems such as Armillaria root rot. Needle-bearing conifers, including

spruces and pines, cannot re-foliate and, therefore, may die after one season of attack. In addition, gypsy moths create a lot of frass (insect excrement) which drops into yards and patios and is quite a nuisance.

Some information on insect growth: Insects have exoskeletons (a thick skin that serves as a skeleton) on the outside of their body. As they grow and get larger, they outgrow their exoskeleton. Through a process called molting, their exoskeleton splits apart and the insect wiggles out. The new skin soon dries and hardens to become a new exoskeleton. Each stage of the insect between molts is called an instar.

The first instar of gypsy moth caterpillars is black, hairy, and only about one quarter of an inch long. Their head is black, shiny, and large compared to the rest of the body. The second instar has a brown stripe down its back. By the third instar, the caterpillar develops orange spots. Mature gypsy moth larvae (fourth, fifth, and, if female, sixth instars) have five pairs of blue spots on one end and six pairs of red spots on the other end. All instars are hairy. By the time they reach their last instar, the caterpillars are two to two and a half inches long.

Each gypsy moth caterpillar consumes a large amount of leaves for about six weeks. Then they pupate at the end of June for one to two weeks, emerging as adults in mid-July through mid-August. The adults mate, lay eggs on the lower 20 feet of the tree, and die. For more information about gypsy moth egg masses, read the Plant Health Care Report, Issue 2009.01.

Control: The gypsy moth is attacked by a number of natural predators and pathogens. The insecticidal bacterium, *Bacillus thuringiensis* var. *kurstaki* (*Bt*), can control young larvae but is not as effective against mature larvae. Other natural enemies include an introduced fungus, *Entomophaga maimaiga*, which builds up in gypsy moth infested areas and has led to major gypsy moth reductions in the East during wet weather.

Gypsy moth eggs are killed in winter when the temperature reaches -20° F or colder for at least three consecutive days. In our area this past winter, we did have temperatures go to -20°F and lower but *not* for the three consecutive days that was needed. We have not achieved those conditions since the mid-1980s.

Knowing some gypsy moth biology is helpful for control. The first three instars remain in the tops of trees, but mature larvae (fourth instar and later) feed at night and crawl down from the tops of trees to hide during the day in protected spots. A homeowner can trap gypsy moth caterpillars by wrapping a layer of burlap around an infested tree trunk with the top folded over. The folded flap captures the caterpillars as they ascend the tree, and they can then be discarded into a container of soapy water. The burlap also traps female moths as they climb trees to lay eggs (female moths don't fly). Barrier bands act similar to burlap. They consist of double-sided sticky tape or a sticky material such as Tanglefoot™. Tanglefoot™ discolors bark when applied directly to it so should be applied to the surface of material such as duct tape or tar paper that is wrapped around the trunk. Duct tape alone does not work as the stickiness is washed off in the rain (we

tried this). Both the burlap and the barrier bands should be removed after August. The bands should not be so tight as to girdle the tree.

If you travel in an infested area such as Michigan or Wisconsin during the egg-laying period (July and August), take care to examine the bumpers and underside of your vehicles for egg masses. Scrape off any you find. If you find gypsy moth caterpillars, you can verify their identification at your county extension office or The Morton Arboretum Plant Clinic.

Good websites:

<http://www.na.fs.fed.us/spfo/pubs/fidls/gypsymoth/gypsy.htm>

<http://www.fs.fed.us/ne/morgantown/4557/gmoth/>

<http://web.aces.uiuc.edu/urban/gypsymoth/>

European elm flea weevil

The European elm flea weevil (*Orchestes alni*) adults and damage from their feeding, has been found on newly emerging leaves of elms at the Arboretum. This pest first appeared in Northern Illinois in 2003 and has caused significant foliage damage to elms (particularly Siberian) during the past five years.

Adult feeding results in tiny shotholes in the leaves, and heavy feeding can cause newly expanding leaves to wither and turn brown. After feeding, the female weevil cuts a cavity into the leaf mid-vein and inserts an egg. The hatching larvae create blotch mines at the leaf tips. Larvae feed for about two to three weeks, and then pupate within the mined leaf. The significant feeding can reduce photosynthetic capacity of the tree, thereby impacting overall tree vitality.

Control: Insecticides are effective in controlling adults and could be applied now. According to Phil Nixon, Ph.D., Extension Entomologist at the University of Illinois at Urbana-Champaign, adults can be controlled with a spray of acephate, imidacloprid, bifenthrin, or cabaryl. The acephate and imidacloprid should also prevent the larval mines from appearing later. Depending on how long the insecticide is effective, several applications may be needed. However, spraying a large elm may not be practical. A systemic soil drench of imidacloprid applied in fall after leaf drop will control early spring feeding of adult elm flea weevils. A systemic soil drench of imidacloprid applied in early spring will help with the leafminer stage in late spring and the adults feeding later in the season. This drench does not help with the over-wintering adult feeding early in the season as it takes about two months for the insecticide to be taken up throughout the tree.

For further information on the European elm flea weevil, refer to the feature article by Dr. Fredric Miller in PHC 2005.02

(<http://www.mortonarboretumphc.org/PHC%20report%20pdfs/042205%20Issue%202.pdf>).

Good website:

<http://extension.osu.edu/~news/story.php?id=4169>



Juniper webworm



The overwintering juniper webworm (*Dichomeris marginella*) larvae have begun feeding on green carpet common juniper (*Juniperus communis* ‘Green Carpet’). Infestation is evident by brown needles bound together with silk, primarily in the thick, inner foliage of the tree. The larvae are small, light brown caterpillars, with dark reddish-brown stripes and dark brown heads. At maturity they can reach three quarters of an inch in length. The adult moths will emerge in June and lay eggs on current year’s growth. Young larvae feed as needleminers and often build silken tubes around their feeding sites. Juniper webworm prefers *Juniperus horizontalis*, *J. depressa*, *J. aurea*, and many of the Chinese junipers.

Control: Prune out and discard webbed needle masses now and whenever you see them. Pfitzer juniper (*Juniperus chinensis* var. *pfitzeriana*) and Savin juniper (*J. sabina*) are reportedly immune. Insecticides are most effective against young larvae in June and July but can be applied in April and early May. For further information about chemical control and timing, refer to the *2007 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.

Good website:

<http://www.ces.ncsu.edu/depts/ent/notes/O&T/shrubs/note14/note14.html>

Spruce needleminer

Overwintering spruce needleminer (*Endothenia albolineana*) larvae are feeding on spruce (*Picea gemmata*). Infested needles turn yellow and have round entry holes at their bases. Larvae overwinter in nests formed from silk, dead mined needles and frass. 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 (*P. abies*), white (*P. glauca*), and Colorado (*P. pungens*) 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. Gather and discard the resulting debris.

Good website:

<http://cru.cahe.wsu.edu/CEPublications/eb1089/eb1089.pdf>

Cedar rusts

All three cedar rusts have started sporulating on common juniper (*Juniperus virginiana*) with the spring rains that arrived. There are three main rusts on juniper: cedar-apple, cedar-hawthorn, and cedar-quince. Cedar-apple rust and cedar-hawthorn rust both form brain-shaped “galls” on junipers, with the cedar-apple rust galls being much larger than the cedar-hawthorn galls. During spring rains, gelatinous tendrils called telial horns expand from the galls. Spores are released from the telial horns as they dry and are blown to a host in the Rose family, e.g., apples, crabapples, and hawthorns. Orange leaf spots subsequently develop on the Rose family plants. Spores from the large galls, the cedar-apple rust,



Damage and webbing on spruce



create orange spots on the leaves of apples and crabapples. Spores from the smaller galls, the cedar-hawthorn rust, create orange spots on hawthorn leaves.

Cedar-quince rust is not well-named. Of the three cedar rust diseases, cedar-quince rust can cause the most damage by infecting fruits and twigs on trees in the Rose family, especially hawthorns. Although cedar-quince rust spends part of its life cycle on junipers similar to cedar-apple and cedar-hawthorn rust, it does not form galls on the junipers. Cedar-quince rust appears as spindle-shaped swellings on twigs and branches of junipers. In spring, the swellings turn orange and release spores. If you get a chance to come out to the arboretum during a rainy day, look at our Junipers on the conifer walk. These rusts are just amazing - don't be afraid to touch them. We will discuss symptoms on the alternate host in a later issue.

Control: The disease is usually not serious on the juniper host. Control is usually based on the tree in the Rose family. The best control is to plant resistant varieties of crabapples and hawthorns. Remember, resistance is not the same thing as immunity. Resistant does not mean that the tree will never get rust. It only means that in an average year, it is not likely to have much problem with the disease. In a year that is very favorable to the fungus, even "resistant" trees may show some signs of disease. Following is a list of cultivars that show resistance to rust. As many lists offer contradictory listings, we have chosen to present those trees that appear on at least two lists and that also show resistance to apple scab (crabapples):

Crataegus crus-galli
Crataegus laevigata
Crataegus pruinosa
Crataegus viridis 'Winter King'
Malus 'Beverly' *
Malus 'Bob White' **
Malus baccata 'David' **
Malus 'Dolgo' *
Malus 'Donald Wyman' **
Malus 'Indian Summer' ***
Malus 'Liset' **
Malus 'Mary Potter' ***
Malus 'Prairifire' *

Malus 'Professor Sprenger' *
Malus 'Profusion' ***
Malus 'Red Jewel' **
Malus baccata 'Jackii' *
Malus sargentii *
Malus sargentii 'Tina' *

* also shows excellent resistance to apple scab
 ** also shows good resistance to apple scab
 *** shows fair resistance to apple scab



Cedar-apple rust



Cedar-hawthorn rust



Cedar-quince rust

It is also helpful to remove one of the two host plants or separate one host from another (be aware, spores can be blown a mile or so), and to not plant junipers near rosaceous trees. This isn't very practical in an urban environment where there is a juniper or crabapple in nearly every yard. You can also physically remove galls from the juniper twigs. This is only effective if a few plants are infected and there aren't a lot of galls on each plant.

Chemical control for rosaceous hosts, if used, needs to start as leaves are emerging and when the telial horns are expanding on junipers (now). For chemical recommendations, refer to the CPM if you are a commercial applicator or the HYG if you are a homeowner.

Web sites:

<http://plantclinic.cornell.edu/FactSheets/cedar-applerust/cedar-applerust.htm>

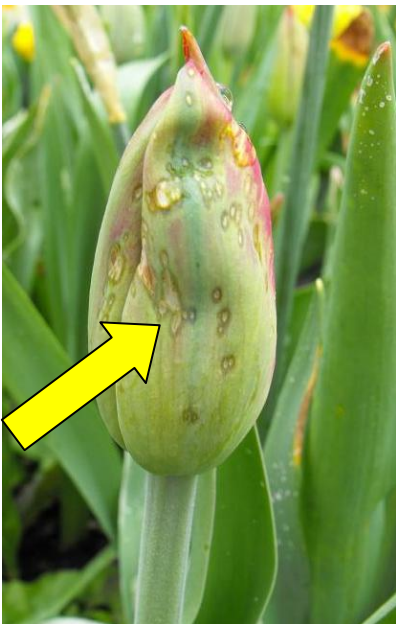
<http://www.urbanext.uiuc.edu/focus/cedarrustdiseases.html>

Sightings Elsewhere

Tulip fire

Botrytis blight or tulip fire caused by the fungus *Botrytis tulipae* has been reported from The Chicago Botanic Gardens. This fungus attacks all plant parts of tulips. Infections occur during cool (60°F), rainy spring weather. Spores spread rapidly by wind or rain.

Symptoms of infection appear in spring as stunted distorted growth and/or light tan to gray-brown spots that can be somewhat sunken on flower petals and leaves. These lesions can coalesce to cover the entire flower or leaf. In severe cases tulips will fail to open. Infected stems will collapse. In damp conditions the fungus may penetrate the bulb. Bulbs will have slightly sunken, yellow to brown circular lesions and may completely rot. This fungus overwinters as small black sclerotia (resting structures) in infected flower, leaf, stem, and bulb tissue.



All pictures are courtesy of Chris Yooning at The Chicago Botanic Gardens

Control: Remove faded or blighted flowers, leaves or entire plants. To stop further spread of the fungus, do not handle infected plants during wet and rainy conditions. Avoid overhead watering or misting of plants. Provide good air circulation by properly spacing plants.

Apply a fungicide spray when *Botrytis tulipae* has been a problem the previous year and/or spring weather is continuously cool and wet. For further information on chemical treatments and a suggested spray program to control this disease, refer to the University of Illinois CPM or HYG.

Good website:

<http://www.ext.vt.edu/pubs/plantdiseasefs/450-607/450-607.html>

<http://ipm.illinois.edu/diseases/series600/rpd609/index.html>

Weed Note

Shepherd's purse (*Capsella bursa-pastoris*)



Shepherd's purse is a cool season broadleaf annual that can grow up to 24 inches tall. This weed has basal leaves (leaves that grow at the base of the plant and are often different in size and shape from the leaves on the stem) that are two to five inches long and arranged in a rosette. The leaves on the slender stem are alternate (leaf attachments that are singular at node and alternate direction up the stem) and are one to four inches long. Flowers are small, white, and have four petals that are arranged in a shape of a cross. Bloom time is from March until frost. Shepherd's purse reproduces by seed. Seed capsules are heart-shaped, a distinct identification character. It is salt tolerant and grows in thin turf or newly seeded areas.

Control: Mechanically remove or hand pull before flowering. Apply a post-emergence broadleaf herbicide in mid spring and again in the fall. For further information on chemical control, refer to the University of Illinois CPM or HYG.

Henbit (*Lamium amplexicaule*)



Henbit is a cool season broadleaf annual that can grow up to 12 inches tall. One to one and a half inch long leaves are opposite (leaf attachments are paired at each node), dark green, pubescent above and lighter in color underneath. This weed has square stems. Two-lipped pink to purple-colored tubular flowers are arranged in whorls between the stem and the upper leaves. It blooms from April through June and occasionally will re-bloom in September. Henbit reproduces by seed and can root at the stem where the stem touches the ground. It grows in moist fertile soils.

Control: Mechanically remove or hand pull. Apply a post-emergence herbicide from mid-late spring and again from mid-late fall. A pre-emergence herbicide can be applied in late summer before germination. For further information on chemical control, refer to the University of Illinois CPM or HYG.

What to Look for Next Week

We will be looking for the leaf crumpler and euonymus web worm.

For all the Moms out there, Happy Mother's Day!!

Quote of the week: “Gardening is the art that uses flowers and plants as paint, and the soil and sky as canvas.”-Elizabeth Murray



The Plant Health Care Report is prepared by Trica Barron, Plant Health Care Technician, and edited by Donna Danielson, Plant Clinic Assistant; Fredric Miller, PhD, 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.

The *2007 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). You may also purchase them online at <https://pubsplus.uiuc.edu/ICLT-07.html> (commercial handbook) and <https://pubsplus.uiuc.edu/C1391.html> (homeowners' guide). One further source is your local county extension office.

This report is available on-line at The Morton Arboretum website at <http://www.mortonarboretumphc.org/>.

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 Trica Barron at tbarron@mortonarb.org.

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