Pests susceptible to control-based on degree day forecasts

( )=Degree day ranges

- Bagworms (700-800)
- Birch leaf miner (500-1000)
- Bronze birch borer (500-1000)
- Euonymus scale several overlapping generations (500-2100)
- European elm scale (900-1200)
- European pine shoot moth (900-1000)
- Flat headed apple tree borer (500-1700)
- Fletcher scale (900-1200)
- Japanese beetle emergence (900-1200)
- Lecanium scale (900-1200)
- Lilac borer (900-1200)
- Taxus mealybug repeat applications necessary (700-2100)
- Peach tree borer (500-2100) 2-4 sprays during this period
- Round headed apple tree borer (500-1700) 3 applications at 3 wk intervals
- San Jose scale (500-2900) repeat applications necessary
- Two spotted spider mite (900-2100)
- Wooly apple aphid (800-900)

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Left: Ash tree declining from emerald ash borer attack. Above: D-shaped exit holes. Below: mealybugs on juniper. May also occur on arborvitae. This was sent in to UK insect diagnostic laboratory 5/25 and the crawlers were still active which is the ideal time to use an insecticide.

Above: Cottony maple scale (NC State Univ); Right: calico scale; Bottom San Jose Scale.
Emerald Ash Borer Found in Cincinnati
Ohio Dept of Ag News Release
On May 23, the Ohio Department of Agriculture added Hamilton County (Cincinnati) to the list of Ohio’s emerald ash borer (EAB) quarantined counties, after discovering the insect in Anderson Township. The quarantine, designed to slow the spread of EAB, prohibits the movement of ash trees, parts of an ash tree, and all hardwood firewood out of Hamilton County.

Department officials, after receiving a call from a concerned homeowner, discovered an infested ash tree off of Newtown Road in Anderson Township. The landscaped tree showed visible signs of EAB, including the insect’s distinctive D-shaped exit holes in the bark. This marks the state’s most southern point of infestation and illustrates the insect’s inadvertent movement through infested ash tree materials.

All of Hamilton County is now quarantined, making it illegal to take hardwood firewood and ash tree materials into neighboring uninsected counties. These materials can move freely between Hamilton and Warren counties but cannot leave the two infested counties. Violators face fines up to $4,000.

Firewood dealers, businesses, or woodlot owners interested in marketing and transporting ash trees or firewood out of quarantined areas can do so only with a department-approved compliance agreement. These agreements stipulate handling practices that mitigate the spread of EAB.

Since it was first discovered in Ohio in 2003, EAB has been identified in 28 counties: Allen, Auglaize, Cuyahoga, Delaware, Defiance, Erie, Franklin, Fulton, Hamilton, Hancock, Hardin, Henry, Huron, Logan, Lorain, Lucas, Marion, Medina, Mercer, Miami, Sandusky, Seneca, Ottawa, Paulding, Warren, Williams, Wood, and Wyandot counties. All or parts of these counties have been quarantined to stop the movement of firewood and ash logs, which are the largest contributors to the spread of EAB. For the latest quarantine map, go to www.ohioagriculture.gov/eab. For the most comprehensive on emerald ash borer go to www.emeraldashborer.info

Ash trees infested with EAB typically die within five years. The pest belongs to a group of metallic wood-boring beetles. Adults are dark green, one-half inch in length and one-eighth inch wide, and fly only from early May until September. Larvae spend the rest of the year beneath the bark of ash trees, and when they emerge as adults, leave D-shaped holes in the bark about one-eighth inch wide.

Kentucky’s Plans For EAB
Joe Collins
To date, emerald ash borer HAS NOT been found in Kentucky. Furthermore, the find of EAB in Cincinnati should not impact Kentucky.

Our office is working to schedule a meeting with USDA-APHIS-PPQ (Animal & Plant Health Inspection Service, Plant Protection & Quarantine) to finalize how things will be handled in Kentucky once EAB is found in our state if which agencies are involved, public relations etc. We are also interested in hearing the plans for the Cincinnati area. More information will be available in subsequent newsletters and on our website www.KyStateEnt.org

Gypsy Moth Traps Going Up
As you travel throughout Kentucky this summer, you may notice some green or brown colored triangular traps on the sides of trees. These traps are used by the University of Kentucky Entomology Department, and the USDA to detect Gypsy moths within the state. This year nearly 7,800 traps will be placed in 104 counties. The number of traps this year has decreased by approximately 2,200 due to budget concerns the Kentucky Division of Forestry was unable to help us place traps this year.

These traps contain a pheromone lure which attracts the male gypsy moths. The pheromone is a mimic of the natural pheromone that virgin female moths use to attract males. Under ideal conditions, male gypsy moths are able to detect the pheromone at distances up to one mile. As the male moths fly around they detect the “scent” of the pheromone with their antennae. They will then fly towards the source and try to mate with the female. However, in the case of the artificial pheromone, as the moths fly toward the scent they fly into a trap and then become entangled on the sticky sides of the trap.
Cottony Maple Scale
Lee Townsend, Extension Entomologist, University of Kentucky

A mature female cottony maple scale is 1/8" long, and has a brown, flat, oval body. Infestations are most easily noticed during the summer when females produce white, cottony egg sacs that resemble pieces of popcorn on twigs. These scales also produce large amounts of liquid waste (honeydew) so leaves may be shiny and sticky and black sooty mold fungus may cover branches and the trunk.

Cottony maple scales commonly infest silver maple but can feed on several species including other maples, boxelder, basswood, birch, elm, and linden. They spend the winter in an immature stage on twigs or branches and complete development in June when the egg sacs appear.

Eggs hatch during June and July and crawlers move to the lower surface of leaves where they settle on sap for the rest of the summer. Just before leaf drop, the small insects will move back to twigs and branches to spend the winter. There is one generation each year.

Scale control can be challenging and may need to be repeated over several seasons. This is due in part to the protection from contact insecticides provided by the waxy coverings over immobile, mature scales. Proper timing of insecticide applications is a major key to success. Applications must target newly hatched scale crawlers which are active in June and July. Crawlers are very susceptible to control measures as they move over plant surfaces to find a feeding spot. Once settled on the plant, they begin to secrete a covering and are protected by it.

Alternatives for crawler control

Cultural control
Scales then to thrive on stressed plants. Follow a recommended fertility program and watering regime to promote plant health. If practical, improve plant sites to reduce stress and promote growth. Prune out heavily infested branches, if possible.

Insecticidal Sprays
Horticultural oils kill by suffocation or after penetrating over-wintering stages of the insect. Dormant oils are typically applied during February or March. Highly refined supreme, superior, or summer oils can be used on many trees and shrubs during the growing season. Read the product label for guidelines on plant sensitivity and temperature restriction before buying and using these products. Insecticidal soaps are long chain fatty acids that kill susceptible insects through direct contact. Like horticultural oils, they require thorough coverage. Soaps leave no residue so repeated applications may be needed for some pests. These products may burn the foliage of sensitive plants, such as Japanese maple, so check the label for information about the plant species that you intend to treat. A variety of natural and synthetic insecticides are labeled for use as sprays to control scale crawlers on landscape trees and shrubs. While the residual life of these products is generally longer than oils and soaps, timing, coverage, and precautions on damage to some plant species are very similar to those for oils and soaps. Systemic insecticides Imidacloprid (Bayer Advanced Garden Tree & Shrub Insect Control Concentrate) is applied as a drench around the root zone of infested plants. This water soluble insecticide is taken up by the roots and transported throughout the plant where it is ingested by sap feeding insects. This provides a means of scale control without reliance on sprays. This product may need to be applied in early spring to control crawlers.

Products for Scale Crawler Control

Acephate: Orthene Turf, Tree & Ornamental Spray; Ortho Systemic Insect Killer

Azadiractin: Bon-Neem; Gordon's Garden Guard Liquid Insecticide
Carbaryl: Sevin
Cyfluthrin: Bayer Advanced Garden Multi-Insect Killer Concentrate
Lambda-cyhalothrin: Spectracide7 Triazicide7 Soil & Turf Insect Killer Concentrate
Dimethoate: Dragon Cygon 2E Systemic Insecticide
Esfenvalerate: Ortho Bug-B-Gon Garden & Landscape Insect Killer Concentrate
Malathion: Ortho Mosquito-B-Gon Tree & Shrub Spray; Bonide Malathion Insect Control Permethrin: Ortho Mosquito-B-Gon Tree, Shrub & Lawn Spray; Spectracide7 Bug Stop7 Multi-Purpose Insect Control Concentrate Bonide Borer-Miner Killer

All insecticides have unique common names that can be found on just below the brand name on the product label. You may be able to find other brand name products for scale control that contain these active ingredients.

Be sure that the product you select is labeled for the plants that you intend to spray.

Systemic insecticides
Imidacloprid (Bayer Advanced Garden Tree & Shrub Insect Control Concentrate) is applied as a drench around the root zone of infested plants. This water soluble insecticide is taken up by the roots and transported throughout the plant where it is ingested by sap feeding insects. This provides a means of scale control without reliance on sprays. This product may need to be applied in early spring to control crawlers.

Evaluating Control

The success or failure of control efforts may not be readily apparent but here are some things to check.

Dead soft scales often fall off the plant. Live scales should produce a liquid when mashed, dead scales will be dry and not “bleed” when crushed.
New foliage of infested plants should have a healthier appearance once the scale burden has been removed. Buds should break a little earlier than when the plant was infested and expanded leaves should have normal color and turgor. Sooty mold and shiny leaves should gradually disappear from plants that were infested with soft scales.

**Natural Enemies**

Scale insects can be attacked by a variety of lady beetles, predatory mites, and small parasitic wasps. Lady beetle adults and larvae can be seen but mites and parasitic wasps are very difficult to see. You can conserve natural enemies by using insecticidal soaps and oils which have limited impact on beneficial species in comparison to other control alternatives.

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**Daylily Leaf Streak and Rust**

John Hartman, Extension Plant Pathologist, University of Kentucky

The foliage of many daylilies (Hemerocallis spp.) grown in Kentucky was injured by the cold temperatures of early April. Portions of leaves were bleached out and necrotic due to the freeze. Daylilies have largely recovered from the freeze damage, and thanks to dry spring weather, are mostly relatively disease-free. However, there is still a need to be wary of daylily leaf streak, a persistent and damaging disease of daylilies in Kentucky, and to a lesser extent, daylily rust disease. These diseases have been addressed over the years in this newsletter. For example, a more complete description of daylily leaf streak and its management was printed in the June 2004 issue of Inspector Findings.

At that time, it was noted that daylily leaf streak susceptibility varied but that none were identified as being resistant. Recent experiments published in Plant Disease Management Reports, Volume 1 suggests that daylily cultivars vary in susceptibility to daylily leaf streak. Researchers G. E. Holcomb, A.D. Owings, and C.A. Broyles at Louisiana State University published an article entitled “Reaction of daylily cultivars to leaf streak infection, 2006.” To simplify their results, cultivars could be grouped as follows.

1. Resistant (1-10% of leaves with symptoms): Buttered Popcorn, Little Business, Oliver Langdon, Pandora’s Box, and Prairie Blue Eyes.
3. Most susceptible (more than 25% of leaves with symptoms): Bayou Bride, Daring Dilemma, Frans Hals, Green Eyes Wink, Happy Returns, Major Blue, Miss Mary Mary, and Perfect Peach Glory.

In these same plots, the researchers also evaluated daylilies for reaction to daylily rust disease and published their results in the same on-line journal. In Kentucky, rust is less common, but could occur if the fungus is introduced by way of new plants.

The authors of the daylily disease evaluation results from Louisiana indicate that the following cultivars are least susceptible to both daylily leaf streak and daylily rust diseases: Bitsy, Black Eyed Stella, Frankly Scarlet, Lullaby Baby, Pandora’s Box and Prairie Blue Eyes. Kentucky gardeners with these cultivars may want to compare them to other cultivars growing in the garden. In the research reported here, the cultivars Lady, Orange Crush, and Rose Pink could not be evaluated for leaf streak disease because of severe rust infection. Kentucky gardeners looking for an efficient way to maintain the health of daylilies in the garden would be wise to avoid highly susceptible daylily cultivars.

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**San Jose Scale Crawler Emergence**

Ric Bessin, Extension Entomologist, University of Kentucky

Editor’s Note: San Jose Scale has many hosts including apple, pear, peach, plum and many ornamental trees and shrubs.

While most of our fruit trees don’t have much of a crop to manage this year due to the late freeze in April, there are a few insect pests that can affect the health of the trees and should be managed. San Jose is one of those pests. While feeding these scale insects inject enzymes into the wood that are toxic and can cause limb dieback or even death of some peach and apple trees. Late May and early June is when the eggs of the first generation hatch and crawlers emerge. During most of the year, the scale nymphs and adults are protected from most insecticides underneath a waxy cap. During the motile crawler stage they are more vulnerable. This is one of the key periods for control of the scale. There is an emergence of crawlers later in the summer, but that generation is not synchronized, emerging over several weeks making control difficult.
In recent years, calico scales have become rampant on several landscape plants, including honeylocust, hawthorn, hackberry, sweet gum, yellowwood, dogwood, flowering crabapple, zelkova, and sugar and Norway maples. Infestations are so heavy in some cases that entire twigs and stems are covered by the scales and the trees are in decline.

Mature calico scales, *Eulecanium cerasorum*, are large, black and white globular-looking insects about the size of a pencil eraser. They have a soft, leathery body and when crushed ooze a gummy, wax-like fluid. The immobile, adult female is the life stage observed during the spring, attached to twigs, branches, and trunks. Some people mistake them for ladybugs, which are roughly the same size. Like other scale insects, the calico scale feeds by sucking plant juices. Heavy infestations can cause premature leaf drop, branch dieback and, coupled with other stresses, eventual tree death. During April and May the maturing female scale produce copious sticky honeydew (sugary liquid excrement) that glazes vehicles and other objects under infested trees, attracts wasps and other nuisance pests, and promotes growth of black sooty mold on infested trees.

The mature females are now dying. Underneath them are thousands of eggs which have begun hatching into crawlers. The crawler stage moves to prefers to the leaves where it settles along veins and sucks juices until moving back to the bark to overwinter. Another reason to take action against the crawlers is that they can become wind borne, spreading the infestation to other trees nearby.

Management

It’s too late to impact the mature females, which turn brown and die just before crawler hatch. However, the underlying eggs are hatching, and the crawlers will be settling on the leaves. The yellowish, newly-hatched crawlers are tiny, but under close inspection their movement will be visible to the naked eye. Insecticide applications, timed to coincide with emergence of young crawlers, will break the cycle of development and reduce the infestation. The most effective insecticides for crawler control are pyrethroids such as TalstarOne, Tempo (= Bayer Advanced Lawn & Garden Multi Insect Killer), and Scimitar (= Spectracide Triazicide). Sevin also can be used. So-so control of crawlers can also be achieved with 2% horticultural oil or insecticidal soaps. Thorough coverage of infested twigs, branches and adjoining leaves is important. The hatching period lasts several weeks. Pyrethroids have sufficient residual to control them with one application, but a second treatment, 2 weeks later, may be needed if using Sevin, soaps, or oil.

Calico scales overwinter on the bark as flattened, grayish nymphs. Treating with a pyrethroid in late March, or early April, as soon as the scales begin to swell, has been very effective in controlling calico scale infestations. That timing prevents the tree stress and honeydew problems caused by the maturing females in the spring.

**Calico Scale Alert**
Mike Potter & Dan Potter, University of Kentucky

Dr. Jamee Hubbard studied Calico scale for three years in Dr. Dan Potter’s Turf and Ornamental Laboratory while working on her doctorate degree. In that time, she has made several interesting discoveries about this insect. First, unlike most other scales, oils do not seem to be very effective at controlling this pest. This is true of both the summer oils and dormant oils. Jamee said that oils will give some control in the spring when the crawlers first hatch but the rate is low. The best products that she has found are Talstar (and other pyrethroids) and Orthene. Sevin also provides good control but caution needs to be taken when using sevin because it is extremely toxic to bees. Control is easier when the crawlers are small but control measures can be effective until the crawlers move off the leaves in the fall. The key to good control is getting the insecticide to the underside of the leaf where the crawlers are feeding.
May Beetles
Lee Townsend, Extension Entomologist,
University of Kentucky

May beetle is a generic term for a large group of 3/4 inch long light brown to dark brown beetles that emerge in May or early June. The adults of many species don’t feed but those of other species can strip the foliage from oaks, and some other trees. The adults feed at night eating the leaf tissue and leaving only veins. This means the damage appears suddenly with no apparent cause. Caterpillars can cause this type of injury but they should be found on or near damaged leaves. The beetles fly in, feed, and move away with no trace. Small trees can be protected with an application of Sevin, if necessary.

Reminder:
Nursery license renewals are due June 15, 2007
(not nursery dealer)