OFFICE OF STATE ENTOMOLOGIST

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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)
- Woolly apple aphid (800-900)

2004-The Return of the 17 Year Cicada

Next year brood X of the 17 year cicada will emerge state wide. The following is an excerpt from an UK Entfact 446 about cicadas.

Damage
There are two aspects of periodical cicada damage. The most obvious occurs as females lay their eggs in small branches. A second, delayed effect can occur as the nymphs feed on sap that they remove from the roots during their long life below ground. Egg laying injury occurs when female cicadas slit the bark on pencil-sized twigs and lay their eggs inside the wounds. They prefer grapevines and oak, hickory, apple, peach and pear trees. This results in "flagging," or breaking of peripheral twigs on small trees or shrubs. Orchard and nursery owners probably should not plant young trees or shrubs in the years preceding an emergence of periodical cicadas, because young trees may be harmed by severe flagging. Young trees may be fatally harmed by severe flagging. More mature trees and shrubs usually survive even dense emergences of cicadas and continue to grow during subsequent years. This can be difficult to believe in the month or so following a large emergence because many deciduous trees will turn brown due to breakage and death of peripheral twigs.

Cicada damage can easily destroy the current year’s growth so increased pruning is required to get rid of damaged areas. The most serious consequence for nursery plantings will be the injury to usable living branches which provide the basic structure for the plant. These wounds cause a weak point so branches that are gathered together and tied during harvest and shipment are broken very easily. In order to have quality trees to harvest in a production nursery, one may have to remove 1 to 2 years of growth in order to develop usable branches on a finished product. This may mean that the trees near the end of their production cycle may be rendered useless.
as a marketable crop during the fall after emergence or during the next year. Below ground feeding by large numbers of nymphs can cause long-term damage. Once they have burrowed into the ground and reached the roots, no control method is available. During the first five years, feeding by the nymphs probably will not be noticeable. However for years 6 to 13 of the life cycle, cicada nymphs may be extremely destructive to plants, especially those that bear fruit. In general, cicada damage will not be of any importance on fully-grown shade trees, although the current year’s growth may be reduced.

Control
Because egg laying is the real danger from these insects, consider emergence as the signal to begin protecting plants. A week or so after emergence, females are ready to lay eggs. Plants can be protected in three ways: covering, spraying and pruning.

Small trees can be covered with a protective netting cheesecloth. Be sure to secure the bottom around the trunk to prevent the insects from crawling up from below. This covering will have to stay on for the next four to six weeks or until egg laying is complete. Insecticides can be used to reduce damage by cicadas but several applications may be needed. Dursban (chlorpyrifos) and Sevin (carbaryl) are labeled specifically for periodical cicada control. Several synthetic pyrethroid insecticides are labeled for landscape trees and shrubs. Often, these insecticides have a repellent effect that causes insects to leave treated surfaces shortly after landing on them. The following examples do not list the periodical cicada but are broad spectrum products that are effective against a wide range of insects - Astro (permethrin), Decathlon 20 WP or Tempo (cyfluthrin), DeltaGard T&O (deltamethrin), and Scimitar (lambda cyhalothrin). Several of these are available only to commercial applicators.

Nurseries under a routine spray schedule should be sprayed according to intensity of the outbreak, which can range from a few cicadas in some areas to massive numbers in other areas. During low level outbreaks application may be needed twice a week. During massive outbreaks, damage will potentially occur even with daily applications. Continued cicada flight to landscapes and nurseries from surrounding woods keeps reinestation pressure high for several weeks. Control is most effective when the insects are hit directly with spray droplets. Residual control must rely on cicadas sitting on treated surfaces long enough to absorb the insecticide. This can delay or reduce action on the insect.

The following are some of the products available to homeowners: Lawn and Garden Insect Killer (cyfluthrin) and Ortho Bug B Gone Spray (esfenvalerate). Spectracide Bug Stop Multipurpose Insect Control Concentrate and Total Pest Control Outdoor Formula contain (permethrin). Be sure to read the product label closely because many of these products are not labeled for fruiting plants and trees that are bearing.

A third alternative is to prune out egg-laying wounds before eggs hatch, especially in fruit orchards where juveniles feeding on roots may decrease fruit production. Although this is a time-consuming process, it may be a viable alternative considering the production life and long-term value of fruit trees.

**Oak Moth Caterpillar Attacking White Oaks**
Lee Townsend, Extension Entomologist, University of Kentucky

White oaks in several locations in the state are being fed upon heavily by the common oak moth caterpillar. This caterpillar wears camouflage on its back and moves like an inchworm. The body is brown with tan to black blotches on its sides; its back is checkered with diamond-shaped markings and slanted lines. Many are about 1-1/4 inches long now so they are nearly full-grown and will stop feeding soon. There is only one generation each year with the caterpillars active from May to June. Common oak caterpillars seem to be able to feed on many kinds of oaks but prefer white oaks. In many cases, trees can be severely or completely defoliated. While a single defoliation should not adversely affect established, healthy trees, previous droughts or other stresses can increase the impact of this damage. In general, an insecticide application is neither practical nor recommended, cultural measures to promote tree health are more likely to be beneficial.

**Galls Appearing**
Lee Townsend, Extension Entomologist

Galls are irregular plant growths, which are stimulated by the reaction between plant hormones and powerful growth regulating chemicals that can be produced by some insects or mites. Galls may occur on leaves, bark, flowers, buds, acorns, or roots. Leaf and twig galls are most noticeable. The inhabitant gains its nutrients from the inner gall tissue. Galls also provide some protection from natural enemies and insecticide sprays. Important details of the life cycles of many gall-makers are not known so specific recommendations to time control measures most effectively are not available. Gall makers must attack at a particular time in the year to be successful. Otherwise, they may not be able to stimulate the plant to produce the tissue, which forms the gall. Generally, initiation of leaf galls occurs around "bud break" or as new leaves begin to unfold in the spring. Oaks are susceptible to many gall makers. The woolly fold gall, caused by a small fly, is a striking example. A fuzzy white pubescence appears on the leaf and is associated with a pouch that contains the larval stage of the fly. Galled leaves are deformed but overall tree health is not affected adversely. More information on galls are available through the extension office.
# Seasonal Appearance of Ornamental Pests and Normal Time Frame to Apply Control Measures (for the month of June)

From The University of Tennessee Agricultural Extension Service PB 1589, Frank Hale, University of Tennessee

<table>
<thead>
<tr>
<th>Hosts</th>
<th>Pests</th>
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<tbody>
<tr>
<td>June (early)</td>
<td>Arboretus</td>
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<td>Ash</td>
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<td>Birch</td>
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<td>Flwr fruit trees</td>
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<td>Hemlock</td>
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<td>Hickory</td>
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<td>Oak</td>
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<td>Pine</td>
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<td>Rhododendron</td>
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<td>Spruce</td>
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<td>Sweet gum</td>
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<td>Sycamore</td>
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<td>June (mid)</td>
<td>Walnut</td>
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<td>Yew (taxus)</td>
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<tr>
<td>June (late)</td>
<td>Arborvitae</td>
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<td>Ash</td>
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<td>Rhododendron</td>
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<td>Shade trees</td>
<td>bagworms, leafhopper pers</td>
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<td>Shrubs</td>
<td>Japanese beetle</td>
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<tr>
<td>Spruce</td>
<td>spruce spider mite, spruce needle miner</td>
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<tr>
<td>Willow</td>
<td>walnut caterpillar</td>
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<tr>
<td>Yew (taxus)</td>
<td>Fletcher scale, black vine weevil</td>
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</tbody>
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## Yellow Poplar Weevil

Lee Townsend, Extension Entomologist

Yellow poplar weevils, also known as sassafras or magnolia weevils, are small black snout beetles that damage yellow poplar, sassafras, and magnolia. Adults chew distinctive holes in the leaves that resemble curved rice grains in size and shape. The larval stage, a white legless grub, develops and feeds inside the leaves of poplar and sassafras. The combined activity of adults and larvae can cause significant leaf loss. While injured leaves cause the trees to be unsightly, damage to established trees probably does not affect its overall health.

### Biology

There is one generation of this insect each year. Adults pass the winter in leaf litter. They become active and start to feed on warm days in late April and early May. Before bud break, the weevils attack the swelling buds leaving their distinctive feeding marks. As the leaves unfold and enlarge, they, too, are fed upon. Holes in the leaves, about 1/8” in diameter, result from adult weevils puncturing the buds or feeding on the lower surface of the leaves.

Mating and egg laying occurs in May and early June. The eggs are placed in the midrib on the underside of the leaves. This injury can break the leaf midrib. Newly-hatched larvae move from the midrib into the leaf where they feed as leaf miners. The mined portion of the leaf turns brown and takes on a scorched appearance. When ready to pupate, the larvae move to an inflated portion of the mine and spin a spherical silk cocoon. Duration of the different life stages varies from the midrib to the leaf.
with environmental conditions.

New adults begin to emerge from leaves during the second week of June and feed on the foliage. Sometimes they chew through the leaves, but more often they remove only the lower epidermis and mesophyll, leaving the upper epidermis intact. This produces many chlorotic spots and results in the scorched appearance of severely attacked trees. Feeding by the newly emerged weevils can be severe. Leaf drop occurs when damaged trees are also under drought stress. By mid-July the adults have disappeared to their hiding places in leaf litter and will remain inactive until spring.

Control

Insecticides such as acephate (Orthene), carbaryl (Sevin), or chlorpyrifos (Dursban) may be used to reduce damage to the foliage. Treat when feeding damage is seen on about 10% of the branches and repeat as necessary. Weevils arrive at trees over an extended period; treating at the very first sign of damage may be premature and require an additional application in a few days. While the damage may be unsightly, the injury to large, established trees in landscapes or wooded areas probably will not harm the tree.

Dead Branches in Trees

Bill Fountain, Extension Horticulture Specialist

There are many trees in the central Bluegrass with branches that are slow to leaf out or appear to be dead. While we are slightly behind on degree-day accumulations, it is not enough to account for this delay in shoot growth. The central Bluegrass experienced a devastating ice storm on 15 February 2003. It is my feeling that this meteorological event is the most likely cause for branch death and abnormally late leaf out.

The ice storm resulted in accumulations of 1.5 inches of ice, sometimes more on exposed twigs and branches. If we assume that this 1.5 inch diameter is all water, it amounts to almost 10.5 ounces of weight per linear foot of twig. When this is multiplied by hundreds of feet of twigs on every large branch, it is no wonder that these large structural branches bent and often broke under the ice load.

The temperature was cold prior to the onset of freezing rain and remained at or below freezing for several days. Normally this is not a significant problem and the freeze-thaw cycle occurs hundreds of times throughout a normal winter. It can be assumed that some liquids within xylem tissues were frozen prior to the ice storm. As branches were bent by wind and downward by the weight of ice as it accumulated on branch surfaces, ice crystals within the xylem broke rupturing these conductive tubes. As the temperatures rose and fell again, liquids refroze in the downward bent branches. As surface ice on branches began to melt, branches assumed a more upright position rupturing additional xylem (conductive) tissues. Add in the destruction to xylem tissue resulting from the sheer act of bending and the tree is left with an extensively damaged network of xylem tissue unable to move liquids upward from the root system to the buds.

As the ice melted the still living twigs and buds become upright only to die later as the plant was unable to transport water and mineral elements past the points of damage. Many of these branches are now dead and can not be expected to produce new leaves. Removal by pruning is the only beneficial treatment.

As we progress into the hot, dry summer months we can expect leaf scorch and additional twig death on severely damaged trees. Fertilization is not the answer. Spring fertilization may result in growth that the plant will be unable to support as the evapo-transpiration rate increases in summer and rainfall becomes limited. The best recommendation is to irrigate as necessary to insure that water does not become a limiting factor for trees and shrubs.

Insects and diseases are opportunistic, attacking plants that are stressed and less capable of producing defensive chemicals and compartmentalizing damaged tissues. Protective sprays should be used especially for species such as dogwood, redbud, ash and red maple that are especially susceptible to borers and other destructive pests. Anticipating potential insect and disease problems is the foundation of plant health care (integrated pest management) systems and is greatly superior to attempting to solve these problems after they become acute.

Extreme weather events make us realize that no matter how advanced we think we are, we are all at the mercy of our environment. Practicing sound management procedures in our urban landscapes will help to insure that we live in a safe, healthy, beautiful environment. Losses from wind and ice are not a total loss if we use these opportunities to learn and correct our past mistakes.

Calico Scale

Mike Potter & Dan Potter, Univ of Kentucky

Mature calico scales 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 adult female is the life stage now being observed attached primarily to twigs and stems. Underneath each female, however, are literally thousands of eggs which soon will be hatching into crawlers. The crawler stage prefers to suck plant juices from the leaves and also excretes large amounts of honeydew. Crawlers can become wind borne, spreading the infestation to other trees nearby.

It is too late to impact the mature females, which will soon be dying off. Monitor the status of egg hatch and crawler emergence by flicking off the adult scales and observing the eggs, which look like a mass of fine flour. The yellowish, newly-hatched crawlers are tiny but their movement will be visible to the naked eye.

Insecticide applications timed with emergence of young crawlers, will break the cycle of development. Insecticides labeled for crawler control include Dursban, Malathon, Orthene, Talstar, Scimitar, and Tempo (= Bayer Advanced Lawn & Garden Multi Insect Killer). Decent control of crawlers can also be achieved with 2% horticultural oil or insecticidal soap. Thorough coverage of infested twigs, branches and adjoining leaves is important, and since the hatching period often lasts about a month, a second application probably should be made 2 to 3 weeks after the first.

Calico scales overwinter on the bark as mid-sized nymphs. To further reduce the likelihood of problems occurring next year, it probably would be wise to follow up with a dormant oil application (in fall or winter) to trees that were heavily infested with calico scales this year.
Tree Leaf Spots Often Begin in Spring
John Hartman, Extension Plant Pathologist

The most obvious and visible diseases of trees are those affecting the leaves. The effect of each leaf spot disease on tree health varies with the disease and tree affected. In general, those leaf spots that result in premature defoliation will cause the most harm to the tree, and those that appear late in the season or that cause very little death of leaf tissue will only slightly harm the tree. Thus, it is important to diagnose leaf spots correctly and to know how a particular tree is going to respond to the disease.

Symptoms. Leaf spots are usually thought of as well-defined lesions or dead areas on leaves or needles. They may be circular or angular on broad-leaves, or band-like on needles. Because there are so many different fungi and bacteria that cause leaf spots, and there are so many different ways that tree species and cultivars react to the diseases, the symptoms will vary considerably.

---Scab disease spots are somewhat circular, superficial and sometimes roughened lesions. Flowering crabapple scab spots are visible now on susceptible crabapples in Kentucky. Crabapple leaves often respond by turning yellow and falling from the tree.

---Conifer needle spots often appear as yellow or brown bands on the needle. Infected needles usually fall from the branch.

---Leaf blisters are swollen or raised blister-like spots on the leaf surface. Oak leaf blisters may become dead but they rarely cause much harm to the tree.

---Anthracnose leaf spots tend to spread into surrounding tissues so it may be referred to as a blotch. These spots-turned-blotches finally may progress to extensive dead areas that involve the whole leaf and shoot. Anthracnose can also cause shoot dieback because the causal fungus can attack small twigs and branches. Such anthracnose symp-
Clover Mites
Donald Lewis, Ext. Entomologist, IA State Univ.

Clover mites are very tiny arachnids that live and reproduce outdoors, but are frequently encountered as a household pest in early summer and in the fall when they migrate into dwellings by mistake. They are only 1/64th inch long, soft, oval, and flattened from top to bottom. They vary in color from rusty brown to dark red. A distinguishing characteristic is the very long pair of front legs that extend forward like antennae as the mites crawl.

Clover mites are harmless. They cannot bite or sting; they do not infest stored foods; they cannot attack the house structure and furnishings. They are an annoyance and nuisance because of their presence and tremendous numbers. Clover mites reproduce outdoors. Every mite seen indoors has wandered in from outside.

Clover mites are plant feeders only. They feed on sap from grasses and clover, and are especially numerous in lawns with a heavy growth of succulent, well-fertilized grass. They do not cause any apparent harm to turfgrass.

In some situations it may be practical to reduce migration of clover mites into the house by removing the turfgrass and leaving a bare strip 18-24 inches wide next to the foundation. This technique is not always successful, as the clover mites may migrate over woodchip and rock mulches and through flower beds.

The traditional control for clover mites is to apply an insecticide spray as a chemical barrier around the house. Spray the bottom of the foundation, the crevice between the foundation and the ground and the lawn for a distance of 6 to 10 feet out from the foundation. Successful chemical control requires a very thorough treatment. Materials labeled for this use include diazinon, Isotox, kelthane, and malathion. Application should be made as directed on the label and repeated after 2 weeks if mites persist.

Clover mites already indoors can be removed from surfaces with a vacuum cleaner. Avoid wiping the clover mites as crushing them often creates an undesirable and durable brown stain. Household insecticide sprays containing pyrethrins can be used for short-term, contact control of wandering mites.

Degree Day Totals through May 27, 2003
Bardstown—796
Bowling Green—921
Covington—666
Henderson—837
Huntington WV—774
Lexington—744
London—788
Louisville—788
Mayfield—828
Paducah—904
Princeton—919
Quicksand—865
Somerset—889

Degree Day Totals through May 25, 2002
Bardstown - 726
Bowling Green - 814
Covington - 527
Henderson - 763
Huntington WV - 720
Lexington - 707
London - 742
Louisville - 804
Mayfield - 849
Paducah - 860
Princeton - 1022
Quicksand - 789
Somerset - 820