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Kermes Scale

Kermes scales are occasionally found on pin, white, bur, and other oaks in Illinois. They are most common on or near the branch tips and appear gall-like, so they are commonly misidentified as galls. They also tend to feed in leaf axils, so they are sometimes misidentified as buds. The taxonomy of kermes scale species is uncertain because early work relied heavily on color patterns, which we now know are variable. There are approximately 30 species of kermes that occur in North America, but identification is difficult. This goes beyond academic gymnastics, as different species produce crawlers at different times during the growing season.

Control of scale insects relies on insecticide application to the unprotected newly hatched nymphs or crawlers. At least one species produces crawlers in July, but crawlers of other species hatch in September. However, all species overwinter as first stage nymphs on the bark of trunks and branches, making them susceptible to dormant oil application. Apply dormant oil when the tree is dormant and when the temperature does not drop below freezing for the next 24 hours after application.

On white and bur oak, kermes scale tends to cause twisting, crooking, and other distortion of the branch tip. Leaves are also misshapen and twisted,

and some of the leaves die. Damage is noticed from the ground as scattered branch tips appearing whitish and/or brownish due to dead leaves and the leaf distortion revealing more leaf undersides. The scales feed at the base of petioles, on leaf veins, and at twig crotches. The scale is rounded and about one-eighth inch in diameter. Although the scales are brownish, they frequently appear blackish due to a coating of sooty mold. Sooty mold is a black fungus that grows on the honeydew, the partially digested and concentrated plant sap excreted by many scale insect species.

Kermes scales have recently been seen on bur oak in Illinois. These scales tend to be located on the twigs at or near leaf buds and at twig crotches near branch tips. They are rounded and up to one-quarter inch in diameter. They vary in color from dark brown to tan with dark brown banding. Leaf and branch distortion is not evident, but they cause noticeable branch tip droppage.

Overall, infested trees grow slower and are twiggy and bushier due to terminal damage and subsequent lateral branch development. Kermes scales are native insects, and their populations are kept in check by several natural enemies including a parasitic wasp, a lady beetle, and a predatory caterpillar. Although almost all caterpillars are herbivorous, there are a few species of moths whose larvae feed on other insects. (*Phil Nixon*)

Aphids

Aphids are more noticeable this spring, particularly on linden and tulip poplar, than they have been for many years. Since the late 1990's when multicolored Asian lady beetles became numerous in the state, aphid numbers have tended to be low.

Aphids are soft-bodied, pear-shaped insects. There are many species of aphids, with adults ranging from pinhead-sized to 1/4 inch long. On trees, most are closer to pinhead-sized, but a common aphid on willow is one of the largest aphid species. Aphid species vary in color, with green being most common. Even a population of one aphid species on a plant may vary in color, apparently depending on factors such as temperature, crowding, and food quality. Aphids tend to have long, spindly legs and long, slender antennae.

Aphids overwinter as eggs, typically on a plant other than the one where they are common during the summer. These eggs hatch into all wingless females that feed on the winter host and give birth to more aphids. Usually after two to three generations on the winter host, the aphids mature into winged adult females that fly to the summer host. On the summer host, up to 30 generations of aphids are produced, all of them being females that give birth to living young without fertilization. Generations are commonly produced weekly, resulting in huge populations building up.

Aphid nymphs in crowded conditions are frequently bumped and jostled by nearby aphids. These aphids will mature into wingless females that give birth to nymphs that will develop wings as they

mature into adults, allowing them to fly to new, less infested hosts. Lengthening nights towards the end of the growing season cause females to give birth to nymphs that will mature as winged males and females that must mate to reproduce. The aphids fly to their winter host, where the females lay eggs that overwinter.

Typically, about 2 weeks after they become numerous, aphids that are exposed on the leaves and stems are usually controlled by natural enemies, making insecticide application unnecessary in most cases. Not only does the multicolored Asian lady beetle feed on aphids, but so do other lady beetle species, lacewings, syrphid flies, parasitic wasps, and other insects.

It is more common to control aphids due to their sticky honeydew coating sidewalks, cars, lawn furniture, and other objects under infested trees than to control tree damage. Aphids tend to feed near the tips of branches on the young leaves and stems. This feeding can cause the leaves to wrinkle, curl, twist, or become distorted in other ways. Similarly, young, green stems may curl or twist due to aphid feeding. If needed, contact insecticides such as insecticidal soap, summer spray oil, and pyrethroids are effective. The systemic insecticide, imidacloprid (Merit), is also effective against aphids. (*Phil Nixon*)

Japanese Beetle

Japanese beetle adults have emerged in Kentucky, so be watchful for emergence in southern Illinois. We continue to see insect emergence about two weeks ahead of schedule throughout Illinois.

With emergence in southern Illinois typically occurring around the middle of June, emergence is likely around the end of May.

Japanese beetle adults are present for about six weeks and fly to new hosts every three days. They are strongly attracted to previously attacked foliage, particularly that damaged by Japanese beetles. Season-long control involves at least three insecticide spray applications. If only one application is applied, it should be applied at early emergence to reduce overall damage.

Carbaryl (Sevin) and various labeled pyrethroids including cyfluthrin (Tempo) and permethrin (Astro) are effective, with each spray lasting about two weeks. Systemic insecticides such as imidacloprid (Merit, others) will provide control. Hand-picking in late afternoon and evening is also effective. Disturbed beetles will drop into a jar held under them. Add a couple of inches of rubbing alcohol or soapy water to the jar to kill captured beetles. (*Phil Nixon*)

Hosta Virus X

Hosta virus X (HVX) is a pathogen that has plagued gardeners worldwide. As with most viruses, HVX will not kill hosta; however it can cause a number of undesirable symptoms to appear on the host. HVX is also a difficult virus to pin down because symptoms can often take years to appear in infected hosts, and in some cases no symptoms may ever appear.

Some major symptoms to look out for include: rugose or wrinkled leaves, light green sections on leaves, ink bleed

symptoms along leaf veins, mottling on leaves, collapsed or sunken tissue, general stunting of growth, necrosis, and ring spots. Symptoms of HVX can be highly variable depending on infected cultivar. Symptoms of HVX are consistent for specific cultivars, so comparisons can be made for suspected infections.

HVX is normally transmitted from plant to plant through wound contact. Sap from infected plants can enter wounds on non-infected plants and quickly take up residence. The virus can also be spread when cuttings or divisions are made of infected plants. HVX can even be spread through tissue culture of infected hostas. Tissue culture is a common way of propagation for large hosta nurseries, so if an infected plant is chosen for culturing the spread of the virus can be extensive. The vector of transmission outside of this is unknown as of now (assuming there is one!), though it is known that the virus has no survivability outside of the living host.

A fun fact on HVX is that occasionally (and becoming more common) hostas are intentionally infected with HVX to produce cultivars with “cool” traits. While this might not sound like an awful idea, these cosmetic hosta cultivars can lead to the increased spread of HVX to hosta everywhere, which is definitely not “cool”. Some of these varieties include (but are not limited to): Leopard Frog, Blue Freckles, Lunacy, Eternal Father, Kiwi, Watercolours, and Breakdance.

The only way to be sure of the presence of HVX in a hosta is through a scientific analysis (ELISA test). If you suspect that

your hosta may be infected with HVX, you can submit a sample of leaves to the U of I Plant Clinic. The fee is \$25 for an ELISA test. Please be sure to include a sample submission form with provided information with your sample.

Sadly there is no easy fix for HVX. Once a hosta has been diagnosed as a host for HVX, it should be eradicated immediately. When removing infected hostas they should not be composted, as this can only increase spread. HVX hosts should be either burned or bagged. If the infected hostas are container grown and the container is to be reused, it should first be washed and rinsed in a 1:10 solution of bleach to water. Infected landscape hostas should be dug out and disposed of in the same manner. As much of the root material as possible should be removed, and that spot in the garden should remain vacant until all root material has decomposed in the soil. When working in the garden with hostas, some techniques can be used to reduce the chance of spreading. Ideally, knives or other tools used to split or cut hosts should be disinfected after use with each plant. Of course one of the best management practices for new buyers: only buy your hostas from trusted nurseries or other sources. (Stephanie Porter and Sean Mullahy)

Oak Anthracnose

After an abnormally warm, dry spring in Illinois, anthracnose might still be rearing its head. Anthracnose is a disease caused by a variety of fungi, all morphologically similar and with similar symptoms: tan to brown or black lesions

on the leaves, stems, flowers, and fruits of various plants. Anthracnose infections occur during rainy, spring weather, and usually subside by mid-summer. Oaks are specifically infected by a form of *Discula anthracnose*, *Discula quercinia*. Over 20 species of oak are prone to varying degrees of infection. White oak (*Quercus alba*) is a highly susceptible species.

Fungal spores of *Discula quercina* are present on the tree year round, inhabiting the buds, twigs and leaves. The infection process is initiated during wet conditions in spring as spores are splashed onto developing leaves. Ascospores, produced on fallen leaves, also contribute to new infections.

There are three main types of symptoms related to oak anthracnose: twig and leaf dieback, leaf distortion, and angular necrotic spots on the mature leaf. Symptoms are usually heaviest on the lower branches. Fungal fruiting structures can be observed on leaves when viewed under a magnifying lens or microscope. The fungus also produces ascervuli, which look like brown to orange pustules on the twigs. The leaf infections continue along the leaf veins into the twigs. The fungus can be actively producing conidia within 2 weeks after the initial infection. New conidia will contribute to further rounds of infection. If conditions are highly favorable and the trees are stressed beforehand, the infection may cause defoliation and twig dieback. Do not be alarmed by the defoliation. In most cases, the infection is not harmful to the long-term health of the tree. The oak can recover by producing new leaves to replace dead ones.

There are several methods of control for oak anthracnose:

1. Large trees can be pruned to improve air circulation. Improved air circulation will lessen the amount of time the foliage remains wet, thereby reducing the likelihood of infection.
2. Sanitation can be helpful, especially on smaller trees. Removal of cankerous twigs to lower the spore numbers can reduce the infection rate. It is also recommended to remove infected plant debris during the winter so that primary inoculum is reduced during the spring.
3. Proper watering and fertilization of the tree to reduce stress can make the tree less susceptible to infection in the upcoming spring.
4. Fungicides are not usually recommended for anthracnose diseases. The damage caused by the disease is mostly aesthetic. Additionally, spraying a large tree with fungicides may be cost prohibitive. Specific chemical options are provided within Pest Management for the Home Landscape. Apply a suggested fungicide two or three times, at 14-day intervals, starting at leaf emergence. Thorough coverage is required. The manufacturer's directions should be carefully followed. Spraying after the disease is evident will only protect healthy new leaves.

It is common to mistake the symptoms of oak anthracnose with other *Quercus* (oak) disease. Below is a more comprehensible chart listing some of the disease that it might be confused with:

Disease / Pathogen	Symptoms
Oak Anthracnose (<i>Discula quercinia</i>)	Defoliation, twig dieback, necrotic spots of leaf tissues. These symptoms usually appear in the lower section of leaves because it is most damp there. Symptoms appear during spring when conditions are wet. The host, however, can recover from the disease.
Bacterial Leaf Scorch (<i>Xylella fastidiosa</i>)	Chlorosis and discoloration, stunted growth and scorching patterns of necrosis present on leaves. The symptoms start on the upper layer of leaves, but leaves continue to remain intact throughout the season. As the years pass, the infection can continue until finally the host is dead.
Oak Wilt (<i>Ceratocytis fagacearum</i>)	Symptoms emerge around spring and summer. They first appear at the top of the tree. Symptoms include wilting, chlorosis along the veins of leaf tissue, leaf cast and discolorations in the xylem. Because the fungus attacks the vascular system, it can kill the host.

For more information, visit:
<http://www.extension.umn.edu/distribution/cropsystems/M1288.html>
 (Travis Cleveland and Zu Dienle Tan)

Catchweed Bedstraw – A Catchy Little Weed

I've had a few queries about catchweed bedstraw lately. *Galium aparine* is an annual weed that has been quite

prevalent this spring. It has a semi-prostrate habit and is commonly found in shaded or wooded areas climbing up over the top of surrounding vegetation. It is primarily found in landscapes, nurseries, small grains, and meadows. It earned the name bedstraw when it was used to minimize matting in mattress filling. This weed may also be known by other names including cleavers, Velcro plant, stickywilly, goose-grass, grip-grass, snatch-grass, and catch-grass. The leaves are narrow, but it's not a grass at all. Stickywilly? That's just a good name.

The leaves are sessile in whorls of 6-8 at the nodes. The leaf blades are lanceolate in shape. Overall, the plant is fairly hairy or prickly allowing it to "catch" easily on skin, clothing, or fur so that seeds are disseminated. The stems have recurved prickles on the ridges and leaves; they are square shaped and break easily. The upperside of the leaves are hairy. The underside has short prickly hairs which allow you to perform magic tricks to impress young children. I'd advise against it though. Recently, I stuck one to my arm in order to demonstrate my profound ability to make it "hang magically" from my arm. Pulling it off hurt quite a bit and surprisingly the pain lasted for a couple of days. My 5 year old was only slightly impressed with my super powers. But what else is new?

The flowers of catchweed bedstraw are produced in May-June in clusters near the axils of the whorls. They are white with 4 petals and 4 stamens. Flowers can occur in only 8 weeks after germination. The seeds are small (2-3 mm in diameter) and typically covered

in small hooks, again to aid in dissemination. Seeds are capable of germinating over an extended period of time. One plant will typically produce 100 to 400 seeds, but occasionally 3,000 or more can be produced according to IPM specialists at the University of California. Seeds can remain viable in the soil for up to three years.

Catchweed bedstraw can be found across North America. It appears to be a more serious problem in the Northwestern states. It can be pulled fairly easily especially in moist soil as it has short roots. Blooming plants should then be discarded so that seed development does not continue. The preemergent herbicide oryzalin can provide fair control of catchweed bedstraw. Postemergent herbicide options include glyphosate, oxyfluorfen, quinclorac, carfentrazone, and diclofenil. This list is not all inclusive but is provided as a starting point. Always be sure to read and follow all label directions. Prevention of seed dispersal is likely the best way to prevent future infestations of this plant.

A similar species is smooth bedstraw (*G. mollugo*) which is a perennial and is smooth overall except at the leaf margins. Carpetweed has a similar growth habit and leaf arrangement, but the stem is round and it is more branched.

Photos of catchweed bedstraw can be found here:

http://www.inhs.illinois.edu/animals_plants/plants/ilgallery/ThePlants/GGenera/GalApa/GalApa.html

(Michelle Wiesbrook)