COOPERATIVE EXTENSION SERVICE
HOME, YARD & GARDEN PEST NEWSLETTER
College of Agricultural, Consumer and Environmental Sciences, University of Illinois at Urbana - Champaign
Illinois Natural History Survey, Champaign

Number 10 – June 25, 2012

Insect Galls

Insect and mite galls are numerous on trees throughout Illinois this year, as they are in most years. Oaks have the most galls, by far, with most of their galls being caused by tiny gall wasps in the Family Cynipidae. Galls are also caused by gall midges (flies), phylloxerans and psyllids (sucking bugs), and eriophyid mites.

Jumping oak gall infestations are more common this year than usual. These galls appear as green pimples on white and bur oak leaves. The galls turn brown later in the year. As the galls mature, they frequently break loose from the leaves and fall to the ground. On a patio or other hard surface, they quiver and jump slightly, hence their name. It is suspected that the gall wasp, Hymenoptera: Cynipidae, lays her eggs on dormant leaf buds, allowing them to appear very early on the leaves.

Hedgehog galls are common this year as they are in most years. There are several species that produce one-quarter inch to one-half inch diameter round, prickly galls on oak leaf midveins. The galls start off green, turning brown later in the summer.

Leaf galls rarely cause any serious harm to the tree as the unaffected tissue on even the same leaf continues to produce food for the plant. Some individual trees appear to be less susceptible to getting galls than others, with it being common for unattacked or lightly attacked trees to grow next to heavily attacked trees. Over the years, there is very little difference in growth in height and trunk diameter between these trees, indicating that leaf galls have little effect on tree heath. However, some stem and twig galls can hinder tree growth or kill heavily infested trees.

Horned oak galls and gouty oak galls continue to be numerous, particularly in southern Illinois. These are woody galls that are brown and coalesce into large galls up to golf ball size that girdle and kill twigs and small branches on pin, shingle, and other oaks. Horned oak galls have one-eighth inch horns protruding from the gall through which the adult gall wasps emerge. Gouty oak galls do not have horns, and the gall wasp adults emerge through holes that they chew through the gall surface.

Horned and gouty oak galls can become numerous enough to weigh down and break branches. Their girdling can debilitate trees to the point of killing them. Their numbers seem to be somewhat less in the last year or two compared to previous years. We may be starting to see the ending of the current infestation.

Most galls are caused by native insects and mites. As such, they are attacked by

parasitic wasps and other natural enemies that tend to keep them under control. Infestations typically follow the course of other native insects and mites, being common for about three years followed by low numbers for about eight years, creating an eleven year cycle of boom and bust. (*Phil Nixon*)

Insect Galls and Insecticides

Insecticide applications rarely provide adequate control of gall insects and mites. Basic to this is an understanding of how galls form and their internal structure.

Insect and mite galls form in meristematic plant tissue. Meristems are areas where the cells are undifferentiated in the growing areas of the plant. They include areas of leaf, stem, and flower buds, root tips, and stem cambiums. Based on chemical messengers, hormones, produced by the plant, these cells will develop into those of leaves, stems, flowers, fruit, roots, xylem, phloem, or bark. They are referred to as embryonic or undifferentiated cells as well as meristematic cells, which indicate their plasticity to form various mature tissues.

Gall-making insects and mites produce chemicals during their feeding or other activities which cause these meristematic cells to form galls rather than the plant tissues they were originally likely to produce. It is thought that physical damage by the gall-maker may cause the gall to form in some cases. Although caused by the insect or mite, the gall is plant tissue similar to a tumor in its creation and make up.

From the plant's perspective, it is walling off and compartmentalizing the attacking insect or mite from the rest of the plant. Plants use various methods to isolate themselves from injury or attacking organisms. From the gall-making insect's or mite's perspective, the plant gall provides an adequate supply of food protected from predator attack. Galls are excellent examples of the co-evolution between plants and insects.

In the plant's effort to compartmentalize the gall-maker, the nutrient and water conducting vessels, phloem and xylem, do not run through the gall tissue. With systemic insecticides being transmitted within the plant primarily via the xylem, the flow of them into gall tissue is greatly reduced. Thus, systemic insecticides typically provide little gall control.

The tissue within the gall is composed of cells that are not typical of those found in other areas of the plant. This results in locally systemic or other insecticides that move or disperse through cells to move even less in gall tissue. The outside covering of the gall is not structured like other plant tissue as well, resulting in low chemical absorption rates.

Adult gall-making insects and mites are the only life stages that occur outside of the gall, so they are the only ones exposed to insecticide or miticide residues on the outside of the plant. The majority of gall-makers are parasitic wasps, and adult wasps have hard, thick exoskeletons that do not absorb insecticides and other external chemicals very rapidly.

In summary, neither systemic nor contact insecticides typically provide

much control of gall-makers. Some gall numbers can be locally reduced by pruning off and destroying the galls, but we typically have to rely on nature in the form of parasitic wasps and other natural enemies to control galls. (*Phil Nixon*)

Emerald Ash Borer

Emerald ash borer has been found in Champaign, IL along Market Street, just south of Interstate 74. This is the second infestation known in Champaign County with it being found in Rantoul a couple of years ago.

The infested tree in which it was found is almost completely dead with only live suckers at the base and a few live water sprouts. This indicates that the borer has been present for at least six years and probably eight to ten years in the tree. Surveys of nearby trees have not been completed.

Emerald ash borer adults continue to be present in all of the infested areas of the state and will persist for the next few weeks. Although each adult lives only two to three weeks, emergence over several weeks results in adult beetle presence for about six weeks. (*Phil Nixon*)

"My Spruce is Dying"—Cytospora Canker

The U of I Plant Clinic has been receiving calls and samples from clients because their spruce trees are declining and dying. Many of samples were suspected or found to be infected with Rhizosphaera needle cast, Stigmina needle blight, environmental problems, and spruce spider mites. One sample we received consisted of spruce branches without needles. We examined the branches, and found no signs of disease. Without needles, we were unable to check for needle blights. The client did provide several helpful pictures to help with the diagnosis.

I called him to get further information on what may be going on with his trees. On the phone, he said that some of his spruces were dying and he was afraid that whatever was killing them might spread to his other trees. He continued to tell me he had a row of spruces on his property that were 15 to 20 years old. One of the spruces had already died. Travis Cleveland, U of I Extension, PSEP (also an urban tree expert) and I both examined his pictures, which were included with his sample. I suspected Cytospora canker and Travis suspected an injury at the base of the tree. I told the client to please check for "oozing cankers" or white sap on the trunks or the branches of his spruce trees, because this is a sign of a fungal disease called, Cytospora canker. In addition, I wanted him to check for any possible injury at the base of his trees.

As it turns out, Travis and I both were correct. A few trees that had been described by the client as "runts" or smaller trees had twine/plastic left on the base of the tree when planted. As these trees grew, the twine/plastic girdled the base of the spruce, causing tree death. Other trees did not have an injury at the base, but may have been stressed, and more susceptible to Cytospora canker. The Cytospora fungus invades weakened or stressed wood. We

can't always determine the cause of stress from the lab, but any site or environmental conditions that are not good for the species could be the actual cause of the problem. Spruces do not do well in hot, dry, poorly drained soil with high clay content. Sometimes problems do not develop on spruce until roots outgrow the area, grow into poor soil, or until weather stress aggravates the situation

Cytospora canker can be identified where white sap is running out cankered areas on the branches and the trunk. These oozing cankers are sometimes confused with bird droppings. Needles on cankered branches may fade and turn brown during late spring and early summer months. Brown, killed needles may persist into the fall. In most cases, lower branches are infected first and move up the tree from year to year.

Infected branches should be pruned out and destroyed. However, if the trunk of the tree becomes infected with Cytospora canker … that can be bad news! Cankers on the trunk/stem of a spruce can cause tree death. Unfortunately, fungicides are not effective. You best option is too to help tree vitality by pruning out dead wood, watering in periods of drought lasting two weeks or more, and fertilizing in the fall or early spring with a balanced tree fertilizer. If you can determine the cause of stress, of course, correct that as well. A fact sheet on Cytospora Canker of spruce can be found at the following link: http://ipm.illinois.edu/diseases/rpds/604.pdf (*Stephanie Porter and Travis Cleveland*)

Have You Ever Wondered How the U of I Plant Clinic Cultures and Isolates for Vasular Pathogens?

When someone suspects that their tree is dying from a vascular pathogen such as Oak wilt, Dutch elm disease, or *Verticillium* wilt, they can send a sample to the U of I Plant Clinic. We usually suggest that they sample from areas of the trees that are showing early symptoms typical of disease as well as wood that may show streaking or darkening of vascular. **We would like the sample to consist of several 1 to 2 foot long branches with at least the diameter of a thumb**. Branches with diameters smaller than ½" are difficult to culture and may not provide accurate results. Contact the U of I Plant Clinic for instructions on how to correctly collect and submit your samples. Our contact information can be found on our website: http://web.extension.illinois.edu/plantclinic/

The procedures of culturing various vascular pathogens are very similar. Below is an example of how we culture for Oak wilt in our plant diagnostic lab.

Students at the U of I Plant Clinic:

1. Take notes on the condition of the oak sample.
2. Label agar plates with sample number, date, type of agar, and OW (Oak Wilt)
3. The bark is peeled back from the end of the branch, so that the wood is exposed under a sterile hood.
4. They flame their knife and notch the wood into tiny wood chips, which remain attached to the branch.

5. Then, they flame their tweezers and pick off wood chips.
6. These wood chips are placed, very quickly, (to avoid any unwanted contamination) into PDA -Potato Dextrose Agar, plates under a sterile hood.

The agar plates are stored on a shelf in our lab, with their paperwork. They are kept there for up to 7 to 14 days to allow time for the fungal isolates to grow.

If we were successful at isolation of the oak wilt fungus, the above pictures show what it would look like growing in our PDA culture plates.

Lastly, we take clear tape and place it on top of the fungus to "catch spores". This clear tape is placed onto a microscope slide with a drop of water on it. If the oak tree is infected with oak wilt or positive for oak wilt, we will see the chains of spores that are seen in the picture above. If none of these spores can be found, the oak sample will be considered "oak wilt negative". (*Stephanie Porter and Travis Cleveland*)

Toothed Spurge—the Un-Impatiens

Have you ever let a young plant grow only to later learn that you shouldn't have? I think many of us have been guilty of this. Let's go one step farther. Have you ever transplanted a mystery plant only to later realize that it was not what you thought it was? Well I have and I probably shouldn't admit that openly to the public, but I'm a firm believer in laughing at yourself and learning from your mistakes. Perhaps you can learn a little something from this too.

A couple of years ago, I spotted a few young plants growing in one of my flower beds. I thought surely these "impatiens" had seeded themselves in, yet I didn't quite remember planting impatiens there the previous summer. Still, I decided these young flowers should live but in another, shadier location. I spent the better part of an hour one hot summer afternoon transplanting these little seedlings. Then after a few weeks, I noticed that these were the oddest looking impatiens I'd ever seen. The leaves had grown longer than they should have and there were these prominent, round seed capsules at the top center of the plant. Upon breaking one stem, I noticed a milky sap. When I finally stopped laughing at my own stupidity, I did a little investigating and learned that my plants were not impatiens but instead toothed spurges (*Euphorbia dentata*).

Toothed spurge is not a weed I learned about in any of my college weeds classes and it's not even included in some of my tried and true weed ID books, yet it is known to occur across most of the U.S. including all of Illinois. It is an annual that grows erect, spreading, and branched from 8 to 24 inches tall. It is typically found in waste areas and roadsides but can be found in field crops, and apparently flower beds. The leaves are opposite but the lower ones can be alternate on the stem. The leaves are ½ to 3 inches long and ovate to lance-shaped. They are typically hairy with coarsely toothed margins. In my defense, the toothed margin becomes more sharply cut (pronounced) with maturity.

The flowers, which lack petals, are small, occurring in clusters at the ends of

shoots and branches. Seed capsules follow soon after the flowers. They are smooth, green, and 3-celled (each with 1 seed). Spurges are noted for having a white, milky juice throughout all plant parts, and toothed spurge is no exception.

Another name for this plant is wild poinsettia. Perhaps I would feel better if I had mistaken it for a poinsettia. This serves as a gentle reminder that proper weed identification is important, anything can pop up in your landscapes, and we all have much to learn or at least I do.

For more pictures of toothed spurge, see: http://weeds.cropsci.illinois.edu/images/Toothed%20spurge/index.htm. (*Michelle Wiesbrook*)