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Tubakia Leaf Spot

Tubakia leaf spot was briefly mentioned in the last issue. We continue to receive samples infected with this disease. The disease is caused by the fungal pathogen, *Tubakia dryina*. All oak species are susceptible to this disease, but those within the red oak group are more commonly affected. This leaf spot is often associated with stressed trees, especially pin oaks with symptoms of iron chlorosis. Other potential hosts include: maple, hickory, chestnut, redbud, ash, black tupelo, sourwood, sassafras and elm.

The symptoms of this disease appear similar to and are often confused with those of anthracnose. As a rule of thumb, oak anthracnose symptoms usually appear in late spring to early summer (May-June), while tubakia leaf spot occurs in late summer with symptoms appearing in July and August. Tubakia leaf spot lesions vary with host susceptibility and environmental conditions. The lesions start as small water soak areas. They become evident as they enlarge and transition to a reddish brown color. Severe infections may cause premature leaf drop, a symptom which can be alarming to those scouting for oak wilt. The Tubakia pathogen is fairly easy to confirm in a diagnostic laboratory with the aid of a microscope. It produces a distinctive disc-shaped fruiting body which is composed of mycelia and spores called a pycnothyrium. Symptoms tend to be most severe on the lower branches where moisture accumulates and remains for longer periods of time.

Tubakia leaf spot is more prevelant in years with abundant rainy weather and moderate temperatures. These conditions promote infections and allow the spread of this fungus. The disease is much less common during years with predominately dry weather.

The disease symptoms may appear alarming, However, the disease develops late enough in the season that there are no long-term adverse effects on tree health. As a result, treatment with fungicides is not usually recommended. Raking and removing fallen leaves may reduce innoculum in the surrounding area, thus limiting disease occurance the following growing season. Promoting tree vigor and alleviating any potential stresses to the tree is also reccomened. (*Travis Cleveland*)

White Mold (AKA Southern Blight)

The common fungal pathogen *Athelia rolfsii* (syn. *Sclerotium rolfsii*) causes a basal rot to stems and petioles of herbaceous plants. We've seen a few samples of hosta and anemone infected with this disease so far this year.

This pathogen can rapidly spread under favorable environmental conditions, so

it's important to scout plants and catch the disease early. Leaves will rapidly wilt, then turn yellow and become necrotic. Distinct lesions will not be seen on the leaves as the fungus is infecting the base of the plant. This also means that infected tissue (leaves on hosta, stems of other plants) can easily be pulled from the ground. Often white, fuzzy mycelia (fungal strands) will be visible along the soil surface, along with small, round, light yellow or tan structures known as sclerotia.

A. rolfsii can be a devastating pathogen. This is partially due to the fact that it can survive for months or years at a time in soil, and partially due to the fact that it has an extremely wide host range with over 500 plant species susceptible including ornamental flowering plants, foliage plants, fruits, and vegetables. Warm, humid environmental conditions trigger the germination of the sclerotia and infection soon follows. In severe cases, entire beds may be infested with different species of plants all succumbing to the same disease.

Management consists of trying to exclude the pathogen, reducing conditions that favor the disease, and removing infected plants. Carefully examine plants before installing them in the landscape. Contaminated plants, containers, equipment, and soil can all spread the pathogen. Heavy mulch layers around the base of plants appears to aid in overwinter survival, so removing mulch from the base of plants in late fall in areas that have been affected by white mold is recommended. If infected plants are found, they should be removed from the landscape. Place them in a plastic bag, seal or tie off the bag, and remove it from the area; do not compost or mulch infected plants. The top several inches of soil around the infected plant should also be placed in the plastic bag and removed.

Removing infested soil, or solarization, of infested areas may be useful depending on the situation. Removing an entire bed of soil can be messy and expensive, but may be the best option for localized, heavy infections. Solarization has shown some promise, though it appears to be very location-specific. Research suggests that it is most effective in more southern areas where temperatures are higher. Clear plastic is laid over the surface of prepared soil and left for 4-8 weeks, depending on the time of the year. The location must get direct sun, and even then the treatment may need to be reapplied every year, making it not very practical for many situations. (*Diane Plewa*)

White Grubs

We have reports of white grub infestations throughout the state. Most of these appear to be Japanese beetle grubs as their numbers have rebounded from being severely reduced by the droughts of 2012 and 2013, and the severe winter that followed. Thanks to Harold Enger of Spring-Green, and others that provided information.

Grub damage shows up primarily on turf that was irrigated and attractive to egg-laying adults in July, particularly the first half of July. Damage appears as irregular brownish spots of turf that are initially only 3 to 8 inches across. As time passes, these brownish areas can enlarge to encompass large areas of turf.

It is common for the grub damage in lawns to stop abruptly at a property line

where the adjoining owner may have watered less in midsummer, the lawn has less thatch or better soil; or other factors may account for this.

Similarly, grub injury commonly abruptly drops off at the edge of irrigation or other practices on golf courses. As a result, the rough is likely to have no grub damage or less than the fairway due to the reduced irrigation in July and higher mowing of the rough. White grub damage gradually decreases as one goes under tree canopies. Adult beetles avoid laying eggs under trees.

Grub-damaged turf easily pulls up because the grubs have eaten off much of the root system. In irrigated turf, the grubs are obvious in the root zone when the turf is pulled back. Most will be in the top one-half inch of soil or clinging to the underside of the turf.

If the soil is dry, the grubs typically migrate downward to find moisture. Tilling the upper 2 to 3 inches of soil beneath the turf with a knife or other tool reveals the grubs. Japanese beetle and masked chafer grubs are C-shaped, white, and range in size at this time of year from 1/2 to 1 inch long. They have three pairs of legs and a brown head.

Actively feeding grubs are blackish at the posterior portion of the abdomen. Because white grubs consume soil in their root feeding, this soil is visible through the body wall of grubs that have been actively feeding. White abdomens on grubs indicate that the grubs are not feeding heavily and are probably dying from insecticide or disease.

As a general rule, 10 to 12 grubs per foot square, that is, an area 12 inches by 12 inches, are enough to cause obvious turf damage. Slightly fewer, 8 to 10, cause injury to heavily used turf; and it takes more, 12 to 14, to injure turf that has no traffic. There are numerous reports of turf looking healthy with numbers as high as 30 per foot square, but year after year, 10 to 12 per foot square has shown to be a good threshold for treatment.

The white grubs descend deeper into the soil as it cools with approaching fall weather. In general, they descend out of the turf root zone in early to mid-October in northern Illinois. In central Illinois, that typically occurs in late October, with the grubs moving down in mid- to late November in southern Illinois.

Japanese beetle grubs migrate downward when the turf root zone temperature drops below 60 degrees F. Masked chafer larvae, annual white grubs, migrate deeper into the soil when the root zone temperature drops below 50 degrees F. It is common for the 3-inch soil temperature to be reported on weather broadcasts and in newspapers. This can be used to determine whether the grubs have migrated downward. The best method is to cut through the turf, pull it back, and locate the grubs.

Marginally high grub numbers can be tolerated by well-watered turf. Under the cooler temperatures of fall, turf with adequate rainfall or irrigation grows roots faster than 10 to 16 grubs per square foot typically eat them, resulting in green, healthy turf. In these cases, insecticidal treatment can be avoided.

Although these same grubs migrate back up into the root zone the next spring to feed on turf roots, some will have died over the winter, and the cool tempera-

tures and typically heavy spring rainfall will keep the turf roots growing faster than the grubs can eat them. In addition, the grubs do not migrate up into the root zone in spring until the soil warms to 50 degrees F. However, the turf resumes growth at considerably cooler soil temperatures, allowing the grass to get a head start on the grubs in the spring. In the spring, masked chafer and Japanese beetle grubs only feed into June before pupating, so there is a short duration of spring feeding.

At this time of year, trichlorfon (Dylox), chlorantroniliprole (Acelepryn), or *Bacillus thruingiensis* galleriae (grubHALT) is recommended for white grub control. Irrigating dry turf a couple of days before treatment to bring the grubs up into the root zone increases control. Water in the application with at least 1/2 inch of irrigation.

Insecticidal nematodes are also effective against white grubs, particularly *Heterorhabditis bacteriaphora.* Watering a couple of days before applying insecticidal nematodes to bring the white grubs into the root zone also helps increase control. (*Phil Nixon*)

Emerald Ash Borer

Emerald ash borer continues to spread through the state. Several months ago, the Illinois Department of Agriculture (IDA) deregulated the insect, lifting restrictions on movement of firewood and other materials that might contain emerald ash borer within the state due to it being widespread in Illinois.

However, IDA is still interested in knowing which counties have emerald ash borer. The attached map shows the year in which counties were discovered to contain the pest. The most recent county in which emerald ash borer was discovered was Franklin County.

If you find emerald ash borer in a county not listed on the map, please collect larva, pupa, or adult specimens and give them to your local IDA Nursery Inspector. The specimen must be sent to a USDA lab for verification before a county can be listed, which the inspector will facilitate. If you do not know who your local IDA inspector is, contact your local University of Illinois Extension for assistance. If necessary, the local Extension office can contact the U of I Plant Clinic. If you are unable to obtain emerald ash borer specimens, the local IDA inspector will help. (*Phil Nixon & Scott Schirmer of IDA*)

Woolly Aphids

Woolly aphids typically feed on two hosts during a 1-year period, with most species apparently having to switch hosts. This host-switching occurs in various species from late June to late July, and fuzzy adult females that look like flying lint seemingly drifting on the wind are their means of getting to the other host.

Once reaching their summer host, they feed and give birth to additional wingless generations of females, producing winged individuals that fly back to the other host in the fall to lay eggs. These eggs hatch in the spring into females that give birth to more wingless generations of females, producing the winged females that switch hosts.

There are several species of woolly aphids in Illinois. The woolly apple

aphid feeds in the spring on apple, pear, hawthorn, and mountainash leaves and then moves to elm leaves for the summer. Woolly elm aphid feeds on elm leaves in spring and then moves to serviceberry, where it feeds on the roots for the summer. Woolly alder aphid feeds on alder and then silver maple.

There are also the hawthorn woolly aphid, woolly elm bark aphid, beech blight aphid, *Prociphilus tessellatus* (ash host), and *Prociphilus corrugatans* (serviceberry host) that do not apparently switch hosts. Many woolly aphid species live as nymphs and wingless females on the leaves and twigs as well as on the roots of the same host at the same time. For reasons not well understood, they will migrate from the roots to the stems and vice versa.

The attached photos were taken by an arborist after spraying a hawthorn. There were large numbers of woolly aphids on the leaves, of which many fell to the ground when the tree was sprayed with an insecticide. A few days later, large numbers of woolly aphids were seen on the trunk base. These are probably root-feeding woolly aphids migrating to the above-ground growth of the tree. This migration might have been triggered by the canopy insecticide application but was probably just coincidence. Assuming that the woolly aphids on the leaves and trunk are the same species, this is probably hawthorn woolly aphid. Thank to Craig Casino of Tree Green for sharing the information and photos.

These insects are more curiosities than pests. Occasionally, a host will experience enough leaf curling and honeydew production to warrant aesthetic control, and woolly elm aphid can damage serviceberry roots. Many insecticides are effective against them while on leaves, including many pyrethroids, imidacloprid, and insecticidal soap. The woolly elm aphid can be controlled on elm leaves to reduce serviceberry root damage later. (*Phil Nixon*)