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PLANT DISEASES

Tree and Shrub Water Damage

Most of Illinois received intense rainfalls a few weeks ago. Amounts varied by location, but some received 10 inches in 2 weeks, setting the stage for root problems referred to as "wet feet" on trees and shrubs. Diagnosis of water damage can be difficult because symptoms are often the same as from a lack of water or from other root injuries. Symptoms may include withering of leaves, little terminal growth, small leaf size, yellowing of foliage, and dieback of shoots and roots. Some woody plant species are particularly sensitive, including yews (injured by12 hours of saturated soil), rose, white birch, Norway and sugar maples, flowering dogwood, and forsythia. Water tolerance of many plants is discussed in Sinclair, Lyon, and Johnson's book, *Diseases of Trees and Shrubs.* Most comprehensive tree ID books also list water sensitivities in the species description.

Water damage injures roots, limiting ability to absorb water and nutrients. For this reason, woody plants (trees and shrubs) often show injury when a hot, dry spell occurs after heavy rains. Aboveground plant parts need water, but the roots cannot absorb it fast enough. Watering helps; but in hot weather, the injured roots cannot absorb water fast enough to meet demands of such environmental stress.

Roots need oxygen to grow and to absorb nutrients. When soil is saturated, its oxygen content is low. Without oxygen, roots cannot respire properly and absorb water. Despite abundant water, the plant cannot effectively use it. For long-term management, improve drainage of the soil and drainage away from the plants.

To determine whether water is the problem, dig up some soil around the suspect plant. In a typical situation with too much water, the soil is saturated and standing water may be evident. Roots are black or brown inside, instead of a healthy white. In most cases, fungicides do not help once roots lose the outer layer to water damage: Fungicides are developed to protect healthy plants from root-rot pathogens, not to revive dead roots. They may be helpful to plants along margins of water-damaged areas. The water problem must be alleviated for new roots to form. Root-rot fungi commonly infect stressed plants, especially those stessed by excess water. See *Report on Plant Disease*, no. 602, "Armillaria Root Rot of Trees and Shrubs," and no. 664, "Phytophthora Root Rot and Dieback of Rhododendrons and Azaleas," available in University of Illinois Extension offices or on the Vista Web site. *(Nancy Pataky)*

Better Pictures for Diagnosis

Pictures are worth more than a thousand words in diagnosing a plant problem. Taken incorrectly, however, the pictures may be nearly useless. Images (photos or digital) are a welcome addition to samples sent to the clinic. Those who have used the Extension digital diagnosis system know that the image submitted is the main source of information. Here are a few tips from a diagnostician's point of view on how to take better pictures for diagnosis.

Focus and lighting are the two most frequent problems. Take the time to get the picture in focus. That seems rudimentary, but we receive many blurred images. Hold the camera still and squeeze the shutter-release button rather than moving the whole camera as you push the button to shoot. Always work with the sun or major source of light behind you. With the light source behind the subject, the image is dark, looks like a shadow, and masks details needed for diagnosis.

How do you know what pictures to take if you don't know the cause? Try to use the pictures to show the diagnostician the complete problem. *We* then try to determine the cause. Three good pictures are usually enough. Pictures should show the overall pattern in the landscape, the pattern on one plant, and a close-up of the symptoms.

Stand back and get a view of the entire lawn or garden. This shows the condition of nearby plants, overall damage, possible site problems, and many features you might not think to mention or describe.

Next, move closer and photograph the entire plant from the soil line to the top of the plant. For trees, it is important to see how the trunk enters the soil, tree shape and branching pattern, and injury pattern. Pull back foliage from around the plant base and take a picture of the base as it enters the soil.

Finally, take an image of the insects, spots, blights, lesions, odd coloring, or whatever particular problem you see. In a few cases, it helps to put the insect or lesion under a microscope to see insect parts or fruiting bodies of fungi. Extension offices are set up to take digital images through dissecting microscopes. Often, however, it is not necessary to show that much detail. Although pictures are not necessary to obtain a diagnosis, they certain add to accuracy and convey the extent of the problem. *(Nancy Pataky)*

Ash Tree Problems

There have been many ash tree problems in Illinois over the last decade. This summary has been written to help explain some possibilities, as well as limitations, in proving the problem.

One possible cause of decline is **ash yellows**. This disease mainly infects white and green ash in north-central and northeastern United States. It is a problem in Illinois that is difficult to quantify because it is difficult to confirm. Ash yellows disease is caused by a phytoplasma (formerly called a mycoplasma-like organism). These pathogens are somewhat like virus, cannot be cultured in a lab, and are spread by phloem-feeding insects. They are limited to the phloem tissue.

This disease is characterized by a loss of vigor over 2 to 10 years before the tree dies. Symptoms include short internodes and tufting of foliage at branch ends. Leaves become pale green to chlorotic (yellowed) and may develop fall colors prematurely. The tree may defoliate, and the canopy appears sparse. Cankers form on branches and the trunk, causing twigs and branches to die back. Witches'-broom sprouts of growth may appear on branches but are more common on the trunk near the ground. Cracks in the trunk may appear in this area as well.

It is rare for an ash tree to recover from ash yellows. A great percent of ash trees in our landscapes are green ash, which do not show symptoms as clearly as white ash. It is likely that this disease is more common than we realize because the typical witches'-brooms and yellowing are not always seen with green ash. Instead, we see only the cankers and stem dieback.

Ash decline is often used loosely to refer to more than one condition. I think this problem is very common on Illinois ash trees. Ash decline may involve the ash yellows disease or even Verticillium wilt but is often used for any decline of ash for which a single pathogenic cause has not been identified. Ash decline usually includes branch tip death, defoliation of enough leaves to give the tree a sparse look, and a slow decline over years. Affected trees may appear to recover each spring, then decline in July and August.

To complicate matters, **Verticillium wilt** on ash also results in cankers and dieback, without the vascular discoloration typical of most *Verticillium* infections. (See *Report on Plant Disease*, no. 1010.) It is difficult and time consuming to distinguish between ash yellows, Verticillium wilt, and ash decline in Illinois. Diagnosis depends almost entirely on symptoms that could be caused by a variety of problems.

Verticillium wilt can be detected by traditional laboratory isolations of live leaf petioles. Ash decline cannot, as many factors are involved, many of which are nonpathogenic. Sometimes Verticillium is involved, sometimes ash yellows, and always stress.

There are no cures for any of these maladies of ash. Suggested management to slow disease progression includes removing trees with severe dieback, watering the trees in periods of drought lasting 2 weeks, and fertilizing in the fall with a balanced tree fertilizer. Removing dead limbs may help. I have heard some very good testimonials involving the value of fertilization and watering to ash tree recovery. *(Nancy Pataky)*

INSECTS

Cicada Killers

We have received calls on hordes of large wasps flying around. These are mainly cicada killers, *Sphecius speciosus*, actually considered beneficial insects because they control cicada. This wasp gets its common name due to the fact that it hunts and provisions each cell within its nest with a cicada, which becomes a food source for the young cicada killer. Cicada killers are an urban nuisance pest, especially when nesting, sometimes in large numbers, in a bare area or area around a structure. People get concerned because the cicada killers resemble giant yellowjackets.

Cicada killers are about 2 inches long and black to red, with yellow-banded markings on the abdomen. The head and transparent wings are reddish brown. They are not dangerous, but they are intimidating. Cicada killers are solitary wasps, with the female digging a 6- to 10-inch burrow (1/2 inch in diameter) in the ground. A pile of soil typically surrounds the entrance. The female locates and stings a large insect such as a cicada or katydid and then brings it back to the burrow. She places the insect into a chamber and lays an egg on it; sometimes she puts two in a burrow but lays an egg on only one. She then covers the burrow, digs another, and repeats the process. The egg hatches into a grublike, legless larva that consumes the paralyzed insect. Full-grown larvae overwinter in the burrow, pupate in the spring, and emerge as an adult during the summer, usually in July and August.

Male cicada killers establish aerial territories and patrol for intruders. A male cicada killer drives off other males that enter his territory and attempt to mate with females. Anyone else walking into the territory is typically confronted by a very large wasp, which hovers in front of the face and zips to the side and back. However, after determining that the "intruder" is not a rival, the wasp ignores the individual.

Cicada killers are unlikely to sting a person. Wasp and bee stingers are modified egg-laying devices (ovipositors), so males are not able to sting. Females may sting if crushed, either by being stepped on with bare feet or grabbed with bare hands.

Cicada killers are more common in areas with bare soil, so mulching, planting ground covers, or sodding can reduce associated problems. They become a major problem when nesting in areas accessible to or frequented by the public. Applying permethrin or another labeled insecticide (such as the carbamate-based insecticide carbaryl, Sevin) to the burrowed area should kill females in golf course sand traps. Once females are gone, males leave. In home yards, sandboxes can be covered with a tarp when not in use, as this deters the wasps (and also keep cats out). Sand below swings, jungle gyms, or other playground equipment can be replaced with bark mulch.

Managing cicada killers in volleyball courts and baseball infields is more of a challenge because people with little clothing and much exposed skin are diving and sliding onto the ground. This makes it difficult to recommend using an insecticide on a volleyball court. In these cases, the use of weed or other barriers beneath the sand may be an option. Additionally, raking the sand may create enough of a disturbance to cause the wasps to leave. *(Raymond A. Cloyd)*

White Grubs

Typically, the infestation level of white grubs in turf can be determined the first week of August. Cutting through the turf with a heavy knife and pulling back the sod reveals young grubs. Thresholds vary with turfgrass use, but generally 10 to 12 or more per square foot are enough to cause damage through turf dieback. The numbers are higher in damper areas where irrigation is frequent and near sidewalks and driveways where the soil is warmer from the heat stored in the pavement from the daylight hours.

However, the adult grubs were late in emerging this year. Japanese beetle adults emerged in numbers about a week later than usual in central Illinois, becoming numerous about the first week of July. Even longer delays were observed in northern Illinois. Many areas are seeing fewer beetles than normal, which is probably due to death of overwintering grubs from the deep frost in the soil over winter. However, some areas are reporting very high numbers. With this emergence pattern, damaging numbers are likely to be spotty. Some turf may have few grubs, while other areas may have damaging numbers. Increased scouting is needed to determine and treat areas with high numbers.

Masked chafer adults were even later emerging. Instead of emerging the first week of July and being gone by midmonth, beetles were still being found in central Illinois August 2. In northeastern Illinois, the first were seen July 23, about 2 weeks later than normal. Particularly in northeastern Illinois, the unseasonably cool weather this year has likely contributed greatly to late emergence. Increased rain across most of the state has probably also influenced emergence patterns. The northern and southern masked chafer beetles are the adult stages of annual white grubs, so it will be a while before we know how many grubs will be present. Once laid, eggs hatch in 2 weeks.

Both masked chafer beetles and Japanese beetles tend to lay their eggs in damp soil where there is green grass. In most years, this results in large numbers in irrigated turf, with beetles avoiding dormant, brown, unwatered turf areas. In much of the state, unwatered turf is still green and actively growing. Under these conditions, the beetles lay their eggs over large areas. As a result, most areas will have one to five grubs per square foot, well below the levels required for turf injury. However, raccoons, skunks, and birds damage turf while looking for grubs when numbers are as low as three to five per square foot. In areas where this animal damage commonly occurs, treatment may be needed. Most other areas will probably not need treatment. Scout these areas to be sure. Continue to scout because grubs may not appear until mid-August.

With the late emergence of the beetles, imidacloprid (Merit) and halofenozide (Mach 2) can still be used during the first half of August in central and northern Illinois. These insecticides take about 3 weeks to kill the grubs, but damage should not occur until late August to early September. In southern Illinois, the grubs should have hatched, with damage showing up by mid-August. Treatment with trichlorfon (Dylox) is probably a better option to get quicker control in southern Illinois. *(Phil Nixon and Jim Fizzell with emergence information)*

Caterpillars

At this time of year, several species of caterpillars become obvious feeding on trees. Control is relatively simple if deemed necessary. Many caterpillars feed in groups, where removal by hand or pruning is effective.

They are controlled with *Bacillus thuringiensis kurstaki*, sold as Dipel, Thuricide, and other brand names, as well as by many other insecticides. In the last issue, fall webworm, mimosa webworm, and white-marked tussock moth were addressed. In this issue, additional common summer caterpillars are described.

Yellownecked caterpillar feeds in groups, defoliating large branches. Young larvae are reddish, with white stripes; older larvae are black, with eight broad, white to yellow stripes and a yellow to reddish "neck" dorsally behind the head. Mature caterpillars are about 2 inches long. When disturbed, all in a group raise the front and hind portions of their bodies quickly in unison. They may be first noticed by the large feces, produced in large quantities. The feces (black, barrel-shaped, up to 3/16 inch long) is noticeable when attacked trees overhang driveways, streets, sidewalks, and patios. Yellownecked caterpillars are common on oaks, walnut, hickories, maple, and other trees.

Walnut and sumac caterpillars are similar in size and habits to their close relative, the yellownecked caterpillar. Walnut caterpillar is found mainly on walnut, butternut, pecan, and hickories. It is similar in color to yellownecked caterpillar except it has only a few, narrow, white stripes, no yellow or red "neck," and long, obvious, white hair as a mature, black larva. Sumac caterpillar feeds on sumac, including ornamentals. It is similar in appearance to the yellow-necked caterpillar, with eight broad, yellow stripes; but the body stays reddish even in mature larvae. Like the yellownecked, both species strip large branches of their leaves and produce noticeable feces.

Cecropia and polyphemus caterpillars typically feed singly on oak, elm, maple, and other trees but develop into huge, green caterpillars 4 to 6 inches long, with diameters up to 1 inch. Cecropia caterpillars have two rows of large, bright red and yellow protrusions running down the back, with blue protrusions down the side. Polyphemus caterpillars have thin, diagonal white stripes without colorful balls or other protrusions. Although many leaves are eaten per caterpillar, control is rarely instituted because the caterpillars are so large and unusual in appearance.

Hickory horned devil is another large, solitary, green caterpillar that eats many leaves to achieve its 4- to 6-inch length. This caterpillar has several long, orange horns with black tips protruding dorsally from behind the head and some short, black horns at the posterior. It feeds on walnut, hickory, sycamore, sweet gum, ash, and other trees. *(Phil Nixon)*

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