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Hot Weather and Foliage

During hot weather, even though it appears there may be moisture in the ground, many trees and shrubs will shed entire leaves to reduce the moisture stress and transpiration loss on the plant. Some may think autumn has come early.

You can view it the leaf drop as a “sacrifice some to protect the whole.” Older leaves, more toward the interior of the tree instead of the tip of the branches, are shed in order to protect the newer leaves. In most cases, the entire leaf, including the veins, turn yellow before they drop.

Birch (*Betula* spp.), tuliptree (*Liriodendron* sp.), silver maple (*Acer saccharinum*) and cottonwoods and other poplars (*Populus* spp.) are common leaf-dropping trees. It should be no surprise these trees are also lowland trees, commonly found more in flood plains than the upland oaks and hard maples. Lowland trees tend to develop more surface roots.

Even if there seems to be sufficient moisture in the ground, the tree could be losing water faster through the leaves than it can replenish from the roots. This usually occurs when the temperatures exceed 90 degrees F. Part of the problem is the shallow nature of these water-loving trees; the upper soil levels dry out faster than those below.

Any large summer-flowering shrub is also prone to leaf drop. Flowers double the stress on the plant, and seed production isn't far behind. Sacrificing some flowers and/or flower buds puts less stress on the root system, though it is difficult to remove potential flowers, especially if that's the reason for the plant.

Scorch is another symptom of heat and water stress.

Scorch shows up as drying of leaf tissue, usually starting along the margins and tips of the leaf and progressing toward the veins, which typically remain green. The tissue starts out as a lighter green, progressing to yellow and then finally brown. Leaves may remain on the tree, but seldom recover even with moisture. If the scorch is severe, leaves will drop. Scorch is common on dogwood (*Cornus*), maples (*Acer*), oaks (*Quercus*) and lindens (*Tilia*).

A side effect with leaf drop scorch is an increase if leaf spot diseases, though these are more aesthetically displeasing than harmful to the plant.

Mulching definitely helps conserve soil moisture and keeps the root system cooler so it can extract more water for the plant. Four to six inches of composted wood chips should be sufficient, ideally spread to the plant's dripline.

Deep watering is also recommended, encouraging roots to seek out the lower levels of moisture and cooler soil temperatures. (*David Robson*)

Are You Seeing Spots? - Spotted Spurge

It's time for spotted spurge (*Chamaesyce maculata*) to make its appearance in a landscape near you. This warm-season annual member of the spurge family (Euphorbiaceae) typically appears midseason when soil temperatures are warm enough for germination (60° to 65°F). As soil temperatures climb to more than 90°F, germination can continue provided adequate moisture is available.

Spotted spurge develops a central shallow taproot from which prostrate, reddish stems form a flat, extensively branched mat up to 2 feet in diameter. The taproot allows spurge to be pulled easily from the soil. However, the stems exude milky sap when broken and sticky fingers often result. Leaves of prostrate spurge are opposite, small, oval, and up to 3/5 inch long. Leaves are pale green and sometimes have one purple spot each – hence the name. The leaves can be hairy. The petioles are short. Spotted spurge flowers are very small, inconspicuous, cup-shaped, and develop in terminal clusters or leaf axils from June to October.

Spotted spurge is found in landscape beds, sidewalk cracks, gardens, waste areas, and poor, drought-stressed open turf that is perhaps closely mowed. It reproduces by seeds. It germinates and grows well during hot, dry weather on sandy soils. It can tolerate shade but prefers full sun. Prostrate spurge is very

similar to spotted spurge and considered by some taxonomists to be the same species.

To manage populations of spotted spurge in turfgrass, maintain turf density and health through proper culture. Be sure to water deeply and fertilize in autumn. Avoid close mowing as this opens the canopy to sunlight and weed competition. Mulch can be used to prevent growth in landscape beds. Mechanically remove or hand-pull. Apply preemergence herbicides before germination in the spring; apply postemergence herbicides in late spring through midsummer when plants are young and actively growing. Repeat applications are often necessary. Several herbicides are labeled for control of spotted and prostrate spurge. Some research suggests that the following herbicides may provide better results in cool season turfgrass: triclopyr, dichlorprop (2,4-DP), and carfentrazone, (all postemergent), isoxaben (preemergent), and sulfentrazone (preemergent and postemergent). Carefully read and follow all herbicide labels. (*Michelle Wiesbrook*)

Bleeding Canker of European Beech

The true beauty of a mature European beech is hard capture with words alone. Perhaps Michael Dirr described the tree's landscape value best in his *Manual of Woody Landscape Plants*- "There is no finer specimen tree; so beautiful that it overwhelms one at first glance..." European beech also offers the additional benefit of being relatively free of insect and disease problems. However, bleeding canker is an increasingly significant disease problem on many mature specimens, especially in the Northeastern states.

Closer to home, I have seen several large trees on the U of I campus succumb to this threatening disease. Researchers at Cornell University have taken the lead in researching this disease. They have identified three species of *Phytophthora* from cankered trees. *Phytophthora pini* (formerly *P. citricola* 1), *P. cactorum*, and *P. cambivora*. Of the three, *P. pini* was the most frequently isolated from sampled trees. The disease rarely occurs on American beech (*Fagus grandifolia*).

Symptoms

Bleeding canker symptoms first appear on the lower portion of the tree's trunk as distinct, dark-colored areas of the bark. The cankers often weep or "bleed" a dark, wet, substance, especially during the spring and early summer months. The symptoms progress upward, potentially affecting bark several feet above the soil line, and on occasion some of the lower limbs.

Bleeding cankers severely damage the aesthetic value of the beech tree's bark. However, the greatest injury occurs beneath the bark where the pathogen attacks and kills the inner bark and vascular tissues. Removing the cankered bark reveals discolored, brown cambial tissues. For some trees, cambial tissues develop a reddish-pink discoloration. As the bleeding canker expands, it essentially girdles the tree. The vascular disruption results in sparse, wilted, and chlorotic leaves. Severe infections predispose the tree to other pests and environmental stressors, and may result in the tree's death.

The European beech may have some natural defenses against the pathogen.

Many trees appear to wall-off cankered tissues. However, the presence of bleeding cankers likely predisposes trees to greater damage from other stressors. Drought seems to be at the top of the list of potential sources of stress that contribute to tree decline and eventual death.

Disease Management

- Scout European beech trees to identify the canker during early stages of disease development.
- Avoid and alleviate any stress to the tree. Most canker diseases take advantage hosts in a weakened condition. Irrigating at-risk trees may be beneficial. A light layer of mulch will help maintain adequate soil moisture. Be careful not to suffocate the roots with heavy layers of mulch.
- Cornell University has reported good results from bark drench applications of systemic fungicides containing the active ingredient *mono- and di-potassium salts of phosphorous acid* mixed with a bark penetrating surfactant such as Pentra-Bark. Their research suggests applications will effectively slow canker development, but unfortunately will not cure the tree. The researchers were still able to isolate the *Phytophthora* pathogens from trees one year after treatment.
 - To avoid injury to leaves, Cornell University suggests applying the bark spray in the spring before trees begin to bud-out.
 - They recommend mixing ratio in 21:21:1 (Fungicide: Water: Surfactant).
 - Apply the bark spray top down, starting 6-9 feet above ground.

(Travis Cleveland)

Japanese Beetle

Adult Japanese beetles have emerged in Illinois. Early control reduces damage through the six weeks that they are actively feeding as beetles are attracted to previous feeding damage.

Japanese beetles feed on the upper leaf surface, eating through the epidermis and mesophyll, leaving the lower leaf surface (epidermis) intact. This lower surface is initially light-colored, but soon dries and turns brown. Japanese beetles feed on more than 100 plants, with favorites including smartweed, willow, linden, rose, buckeye, birch, crabapple, apple, cherry, hazelnut, currant, grape, and raspberry.

They tend to feed on the upper parts of plants, causing the upper third or more of favored trees to be heavily damaged and eventually defoliated as damaged leaves drop. This tendency to feed at the top of trees allows one to accept damage on tall trees without it being obvious to the general public.

Traps are available that will attract male beetles to a pheromone and female beetles to a floral scent. Research has shown that these will attract beetles from a considerable distance outside the typical residential landscape, but many of these attracted beetles will not be caught in the trap. This results in more beetle damage in areas that have traps than in areas that do not.

Adult Japanese beetles are difficult to control. Carbaryl (Sevin), bifenthrin (Talstar), cyfluthrin (Tempo), lambda-cyhalothrin (Scimitar), or permethrin (Astro) foliar sprays provides protection for about two weeks. A single soil application of imidacloprid (Merit, others) is

also effective. Do not apply imidacloprid to linden and other hosts that bloom during the Japanese beetle flight season to avoid impacts to pollinating insects.

Hand-picking the beetles every couple of days is effective, but time-consuming. When disturbed, particularly in late afternoon, the beetles fold their legs and drop to the ground. Hold a can or jar containing rubbing alcohol or water with dishwashing detergent below the foliage; the beetles will drop into the container and be killed.

Because Japanese beetle adults feed on many plant species and require multiple treatments for effective control, we recommend that professional landscapers and others avoid spraying most of the landscape. Although Japanese beetles cause obvious aesthetic damage, they are unlikely to cause dieback or death to healthy ornamentals. We suggest that you select for multiple treatments those susceptible plants that are focal points of the landscape, such as roses and crabapples at building front entrances, or small lindens in front yards. Large trees and ornamentals along back property lines can usually be left untreated. Of course, the decision of whether or not to treat a plant requires consultation with the client. (*Phil Nixon*)

Native Bees

National Pollinator Week was June 19-25, a good time to discuss bees. When you mention bees to most people images of golden-yellow honey bees come to mind. However, there is a lot more to bees than the exotic honey bee. In fact, there are over 20,000 bee species worldwide and around 500 species of bees native to Illinois.

Like honey bees, these bees are excellent pollinators that are sensitive to insecticide and fungicide applications. Their numbers have been reduced by diseases apparently introduced by human commerce from other areas of the world. Loss of habitat is also a concern. Tolerance of existing nests and augmentation of the old stems, wood, and bare soil areas many of these use to nest helps increase their numbers. They are generally more reluctant stingers than honey bees and wasps.

While honey bees live in colonies that can reach 60,000 individuals and bumble bees live in colonies that can reach 400 individuals most of our native bees (90%) are solitary bees. Unlike honey and bumble bees that have a division of labor where a queen lays eggs and her offspring perform jobs such as caring for young, foraging, etc., female solitary bees do all those jobs by themselves.

A female solitary bee will select a place to build her nest. Unlike honey bees that live in larger cavities (which is why we are able to keep them in hives) most (70%) of our solitary bees nest in the ground while others may nest in wood, hollow or pithy branches. Once she has selected a location, she will create nest cells. Inside of these cells she places a ball of pollen mixed with nectar and lays an egg on it. When the egg hatches, the larva will feed on the pollen ball. Generally, these bees will not emerge until the following year.

Some of the more common native bees in Illinois are:

Bumble bees – Bumble bees get their name due to the buzz they produce while collecting pollen (buzz pollination). They are social insects and colonies can have 50-400 individuals. At the end of sum-

mer, colonies will die off and mated queens will hibernate. They are cavity nesters, generally in abandoned underground rodent burrows, and are active from spring through late fall. They are robust bees that are hairy with yellow, black, white, brown or orange bands.

Eastern carpenter bee – Eastern carpenter bees are commonly considered pests because they often construct nests in wood of homes and other buildings (painting wood can prevent this). They are active from spring through fall. Due to their large size they primarily visit large and open-faced flowers. They look similar to bumble bees. However, the top of the abdomen of carpenter bees is bare, black and shiny.

Leafcutter bees – These bees cut pieces of leaves or petals to line the walls of their nests. They are solitary nesting and create their nests in pre-existing wood and other plant cavities. Leafcutter bees are active from early to late summer. They are medium to large bees, with smoky colored stout bodies with pale bands on their abdomen.

Sweat bees - Many species are attracted to human sweat which they consume for the salt contained in it, thus their common name. Most sweat bees nest in the ground. Sweat bees can be found from spring through fall, with most species being active during the summer. They are small to medium sized bees and are often brightly colored and metallic with colors ranging from green to red and yellow.

Other native bees include yellowfaced bees, mason bees, small carpenter bees, longhorned bees, mining bees, cellophane bees, and squash bees. (*Ken Johnson, Extension Educator – Horticulture*)