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Wild Parsnip

I love parsnips. Often parsnips (large white carrot-like root vegetable) are substituted for celery in my soups and stews. The cultivated parsnip that we eat heralds from the appropriately named wild parsnip (*Pastinaca sativa*). Wild parsnip has recently been making the rounds on social media, as the plant can leave individuals with burn-like blisters on their skin. Severe cases appear somewhat gruesome, though according to some, it is still not as bad as the itch of poison ivy.

Standing next to wild parsnip will not give you burning blisters. A person must make skin contact with the sap of the plant from a broken leaf or stem. The combination of sap on your skin and exposure to UV light causes phytophotodermatitis: an interaction between plants (phyto) and light (photo) that induce skin (derm) inflammation (itis) (Ferree 2012). The effects are in effect a severe sunburn.

Wild parsnip is closely related to Queen Anne's lace, and has a similar umbrella-shaped flower, though wild parsnip's flower color is yellow. Wild parsnip's stem is slightly hairy, grooved and 2- to 5-feet tall. Leaves are coarse, with saw-toothed edges (Miller, 2016). Plants can be found throughout Illinois invading prairies, oak savannas, and fens as well as roadsides, old fields, and pastures (WDNR, 2016).

The actual hazard lies in the sap of wild parsnip, and exposure can be mitigated just by wearing gloves, long pants, and long-sleeved shirts when working outside, in fields or overgrown areas that contain this plant. Plan weeding activities for later in the evening, during low levels of sunlight, to avoid activating the blistering process (Ferree 2012). Wet sap is required to cause injury. Wild parsnip that has been cut and allowed to dry is safer to handle, but seed can develop while the cut plant lays on the ground. Don't wait too long to dispose of cut wild parsnip or forget about them.

Avoid using string trimmers where you may encounter wild parsnip. The pulverizing, flinging action of string trimmers sprays plant parts and juices everywhere. Operators are often left speckled with blisters and red rashes.

If you are exposed to wild parsnip plant sap, wash the area that came in contact immediately. If you are too late and begin to feel the burn of wild parsnip sap, contact your physician for wound care recommendations.

Check sites periodically for the presence of wild parsnip. Just because it isn't there now, doesn't mean it won't germinate next week.

Mechanically control wild parsnip by cutting the root 1- to 2-inches below the soil surface. Brush-cutters can be used for large populations before seed set. For smaller populations, cut off flowering heads and dispose of in a landfill or by burning.

The little rosette of young wild parsnip can be spot treated with herbicides containing the active ingredient 2,4-D, metsulfuron methyl, triclopyr, or glyphosate. Spot treat the large adult plants in May to June with triclopyr or metsulfuron methyl plus a surfactant (WDNR, 2016).

Because parsnip is a biennial, all control activities should be done before it starts flowering or at least during early flower stage. The basal rosettes can also be controlled in fall to prevent flowering the next year.

Additional Resources

Illinois Nature Preserves Commission Wild Parsnip Factsheet
https://www.dnr.illinois.gov/INPC/documents/vmg/VMG%20Wild%20parsnip%20revised%202007.pdf

Look-a-likes. These plants can be confused for wild parsnip and some have their own nasty maladies
http://hyg.ipm.illinois.edu/article.php?id=807

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Black Knot

The rationale behind the name "Black Knot" is self-evident upon first witnessing it. Black knot is a fungal disease that affects most cultivated and wild *Prunus* species in the United States, including cherry, plum, and chokecherry trees. The disease is caused by the fungus *Apiosporina morbosa (also known as Dibotryon morbosum), and* can be incredibly destructive once established. Symptoms are not obvious in the early stages.

Black knot affects the woody parts of the trees, and primarily girdles twigs. The characteristic knots produced by the fungus can be highly variable in size depending on the age of infection and the

size of the twig. Early in the season the knots are an olive green color. As fall approaches they become corkier and take on the characteristic black color. The knots may also acquire a white discoloration as the season progresses due to a parasitic fungus growing on them. The knots grow perennially, and can get as large as a foot long. Foliage at the other end of the infected woody tissue will eventually wilt, and once infections have completely girdled the tissue foliage may fail to leaf out. In most cases the damage is purely cosmetic and the fungus will not kill the tree. However it does cause considerable stress to the tree, making it more susceptible to other pests. Infected branches often have poor fruit set.

Management for this disease is primarily achieved through cultural means. When purchasing plants try to find certified disease free stock, and check them for any obvious symptoms. Resistant cultivars are available for most ornamental and edible *Prunus* species as well. When planting do not choose a site near any known infections, especially if they are unmanaged. Wild *Prunus* hosts do exist.

Scout trees regularly to begin management before the disease becomes established. If an infection does occur, pruning out knots is the best strategy. Knots are easily seen in the winter time when the tree is dormant and defoliated, and knots should be pruned out before they release spores in springtime. Cuts should be made 6-8" below the knot, and tools should be sterilized in 70% alcohol or 10% bleach between cuts to avoid spreading the fungus.

Knots can still produce and release spores when removed from the tree. They should be burned, disposed of in a closed container, or removed from the site. Unfortunately chemical options are limited in Illinois, and no fungicides are currently labeled for use against this disease. Thus, following the other management recommendations is especially important. (*Sean Mullahy, Diane Plewa*)

Iron Chlorosis and Manganese Chlorosis of Shade Trees

Are the leaves on your tree a little more yellow than you remember them being in previous years? They may be chlorotic, a condition in which leaves turn yellow as a result of destruction of chlorophyll or lack of chlorophyll production. In most cases, chlorosis is the result of a nutrient deficiency resulting from either a lack of nutrients, or the inability of the plant to uptake the nutrients. Iron (Fe) and manganese (Mn) deficiencies are two of the most common nutrient deficiencies seen in woody landscape plants. Pin oaks are especially prone, though we often see chlorosis affecting sweetgum, maple (especially red, silver and hybrid) and birch.

Iron and manganese chlorosis produce similar symptoms. From a distance, affected trees appear a light green to bright yellow. Up-close inspection reveals yellow-green leaves with dark green veins. Generally, an iron deficiency causes the most intense symptoms on the newest leaves, while manganese deficiencies affect the older leaves. As the chlorosis severity intensifies, leaves develop a brown speckling and larger necrotic (dead) areas. If uncorrected, the tree may progressively decline and dieback over the course of several years, and eventually die.

What causes chlorosis?

In Illinois, high soil pH is the primary cause for iron and manganese chlorosis. In most cases, the soil contains plenty of macro- and micronutrients for tree growth. However, as soil pH rises above 6.5, the iron and manganese present in the soil increasingly converts to forms unavailable to plant roots. While each plant species has their own preferred range of soil pH, most of our woody trees like a pH a little below neutral, often in the 6.3 to 6.7 range.

Poor growing conditions can also influence and exacerbate the deficiency and chlorosis. Affected trees are commonly found growing in close proximity to sidewalks, drive ways, gravel parking lots, and foundations constructed with limestone bases that raise soil pH. Compacted soils, poor drainage, root injury, drought and flooding all create an environment unfavorable for root growth and nutrient uptake.

Options for Treating Chlorosis

Management for chlorosis involves determining what element is missing, then trying to alleviate the cause of the deficiency. A soil test can be helpful, both to identify if any major macro- and micronutrients that may be missing, and to check the pH. Several control options are available. Each method has its pros and cons.

1) The best long-term solution is to avoid planting tree species susceptible to iron and manganese deficiencies on sites with elevated soil pH. A soil test can verify whether or not the pH is correct and if adequate nutrients are present. This, however, won't help an existing chlorotic tree.
2) Adjust cultural practices to promote steady root growth. Correct poor soil drainage and compaction. Avoid saturating soils with excessive irrigation.
3) Fertilize with an available form of iron or manganese, using one several techniques.
   - Foliar fertilization is best used for small trees and shrubs. This method involves spraying the micronutrients directly onto the foliage. It offers quick but temporary results, and will need to be reapplied on an annual basis.
   - Chelated iron fertilizers can be worked into the soil surrounding the tree using a variety of techniques. The fertilizer can be incorporated into the top few inches of soil, applied to evenly spaced, 12-15" deep holes, or the chelated iron can be dissolved in water and then injected under pressure into the soil.
   - A variety of trunk injection technologies are available to treat deficiencies. All require small holes at the base the tree. Results may not be observed until the following growing season. Treatments generally last 2 or more years. While effective, some fear repeated applications may injure the tree.
4) Acidifying high pH soils addresses the true cause of the problem. Soil acidification is a challenging task that offers temporary results. Additionally, acidification may not be feasible for larger, established tress. Soils can be acidified using elemental sulfur or iron sulfate. Elemental sulfur is economical, but takes several months to lower the pH. Iron sulfate is more expensive, but will lower the pH in a few weeks.

(*Travis Cleveland*)

White Grubs

White grub eggs are primarily laid during the first half of July. In southern Illinois, most of the eggs have been laid; in northern Illinois, many of the eggs will be laid during the next couple of weeks. Where these eggs are laid and how many are laid rely on several factors, which determine whether preventative insecticides need to be applied to turf during July.

Rainfall is the dominant factor in Illinois in most years. Adult Japanese beetles and masked chafers are attracted to moist soil with green turf to lay their eggs which hatch into white grubs by early August. If non-irrigated turf is dry and brownish, the beetles fly to moist, green, irrigated areas to lay their eggs, resulting in high grub numbers in those areas. If non-irrigated turf is green and the soil is moist, the beetles will lay their eggs in most turf areas, typically resulting in few white grubs per square foot usually do not requiring treatment.

Moist soils are also beneficial to insect-specific fungi that kill white grub larvae. High moisture levels during August and September not only help the turf replace roots eaten by white grubs, white grub numbers commonly decline from fungal diseases.

Rainfall has been adequate in east central, north central, northeastern, and much of northwestern Illinois in June, resulting in non-irrigated turf being green and attractive to white grub beetles. Preventative treatments in these areas are likely to be unnecessary. However, southern, western, and central Illinois have been dry, and white grub eggs are likely to be numerous in irrigated turf in those areas of the state.

Adult white grub population sizes are also factors. The severe season-long drought of 2012, the summer drought in 2013, and the severe cold winter that followed decimated the Japanese beetle population throughout the state. Northern and southern masked chafers, also known as annual white grubs, handle summer drought and deep frozen soils during the winter much better than Japanese beetle. With the reduction in Japanese beetles for the past few years, masked chafer numbers have risen as they don't seem to be able to compete well with Japanese beetles on a level playing field.

Japanese beetle adult numbers are higher this year than they have been since 2012. Their recent rise means that we currently have large numbers of Japanese beetles and still have high numbers of northern and southern masked chafer beetles. There will be no shortage of white grub eggs laid this month.

Hot, dry soils are additional factors in white grub numbers. Turf root zone temperatures of 87 degrees F and above greatly reduce white grub egg hatch. Newly-laid white grub eggs greatly increase size from absorbing surrounding moisture. If they are laid into dry soil, most eggs die. Throughout the two to three week egg stage, dry soils at or below the wilting point cause high egg mortality. This year, even in drier areas of the state and areas that were very hot, soil moisture and temperature probably are having little effect on white grub egg hatch.

Preventative white grub insecticide applications are generally justified to irrigated turf in western, central, and southern Illinois. An application of a

long-lasting insecticide such as chlorantroniliprole (Acelepryn), cyantraniliprole (Ference), or one of the neonicotinoids imidacloprid (Merit), clothianidin (Arena), or thiamethoxam (Meridian) can be made during July. Do not apply Ference or neonicotinoids to turf with blooming weeds or flowers to avoid killing pollinators.

In east central, north central, northeastern, and much of northwestern Illinois, it is better to wait until August, and apply insecticide during the first half of August where scouting of hatched white grubs reveals damaging numbers. (*Phil Nixon*)

Billbug

Bluegrass billbugs have been reported as numerous in northeastern Illinois. Bluegrass billbug occurs throughout the state, with hunting billbug being present in southern Illinois on zoysia and bermudagrass.

Billbug larvae are white, stocky, legless larvae that feed on the roots of turf. Fully grown ones are about 1/2 inch long. Damaged turf will be brown, and typically the damage appears in a circular or ovate pattern, with nearby turf unaffected. If tugged, individual stems or grass plants pull out easily. The bases of these will have been raggedly chewed off. Sawdust-like frass from the grubs will be seen on and in the thatch.

Adult billbugs are cylindrical, 3/8-inch-long, hard-shelled, blackish beetles with elongated snouts like elephants. These beetles are generally flightless, so they have to walk everywhere. This lack of long-distance movement usually confines damaged areas somewhat. Because adults are very long-lived, they may be found at any time of year, walking through the grass or along the edge of sidewalks; grubs in all sizes also are found throughout the year. The adult has a tiny mandible (jaw) at the end of the "snout" that it uses to chew a hole in the stem of a grass plant. It then turns around and lays an egg in that hole.

The resulting larva tunnels down through the stem of the grass plant and continues through the rhizome until it gets too big to fit inside the stem. It then emerges into the soil to feed on the grass roots, as do other white grubs. Although larvae can be found at any time of the year in all sizes, they are most numerous at this time of year, making it an ideal time to apply controls. The damage threshold for billbugs is similar to that for grubs. Expect damage at 10 or more per square foot.

Control is the same as addressed in the white grub article. Trichlorfon (Dylox) is also effective at this time on larvae that have emerged from the stems to feed on the roots. Insecticidal nematodes, particularly *Heterorhabditis bacteriophora*, also provide control. Insecticidal nematodes typically provide about 60% control, whereas chemical insecticides should provide about 95% control. (*Phil Nixon*)

Planthopper

We have been receiving reports of planthoppers in various areas of the state. The nymphs of these insects are covered with and leave behind white, fluffy tufts of waxy strands that get stuck on leaves and stems by the honeydew

that these insects excrete. They are unlikely to cause enough damage to warrant control.

Planthoppers that are common in Illinois include *Metcalfa pruinosa, Acanalonia conica*, and *Anormenis chloris*. Nymphs of various species are found on many species of trees and shrubs, as well as some herbaceous perennials. They are probably most common on blackberry, rose, and hosta. They feed on plant sap with many species producing honeydew, plant sap that has had much of the water removed by the digestive system before being excreted. The feeding causes little apparent damage to the plant, although heavy feeding on hosta causes stunting and reduced bloom.

The nymphs hatch from eggs inserted into plant stems in the spring. They tend to feed in groups and are covered with white flocculent that probably reduces moisture loss and provides protection from predators. Mature nymphs molt into adults which fly away, leaving numerous strands of white flocculent behind. Being adhered to the plant by honeydew, it persists for several weeks.

Adults are typically about one-quarter inch long and half as high. They sit on the stems, appearing like small leaves or flower petals. *Metcalfa pruinosa* is purplish as an adult, appearing somewhat like a dying, shriveled leaf. *Acanalonia conica* is green as an adult, appearing like a young leaf or leafy bract. *Anormenis chloris* is light green to white, appearing like young leaves or whitish flowers. They feed on sap as well. (*Phil Nixon*)

Daylily Leafminer

Daylily leafminer, *Ophiomyia kwansonis,* is being found in many areas of Illinois. This Asian native was first detected in Florida in 2011 and has since spread through much of the U.S., apparently by the movement of infested plants.

The adult agromyzid fly is somewhat rotund, black and about one-tenth inch long. Adult flies are commonly seen in daylily blossoms. Eggs hatch into larvae that tunnel in the leaves. The larval trails are silver-white and slender. After tunneling for a few inches, the mature, light yellow, three-sixteenth inch larva pupates in an oval, brown area of the leaf. The adult fly emerges within a few days. There are two to three generations per year.

Damage is limited to the white, meandering trails in the leaves, causing slight aesthetic injury. Control is primarily by removing infested leaves, but this leaf removal is considered to be more damaging to plant health than is the leafminer.

Although this is an exotic, invasive insect, it does not cause enough damage to warrant insecticidal control. Naturally-occurring predatory and parasitic insects provide some control. (*Phil Nixon*)