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

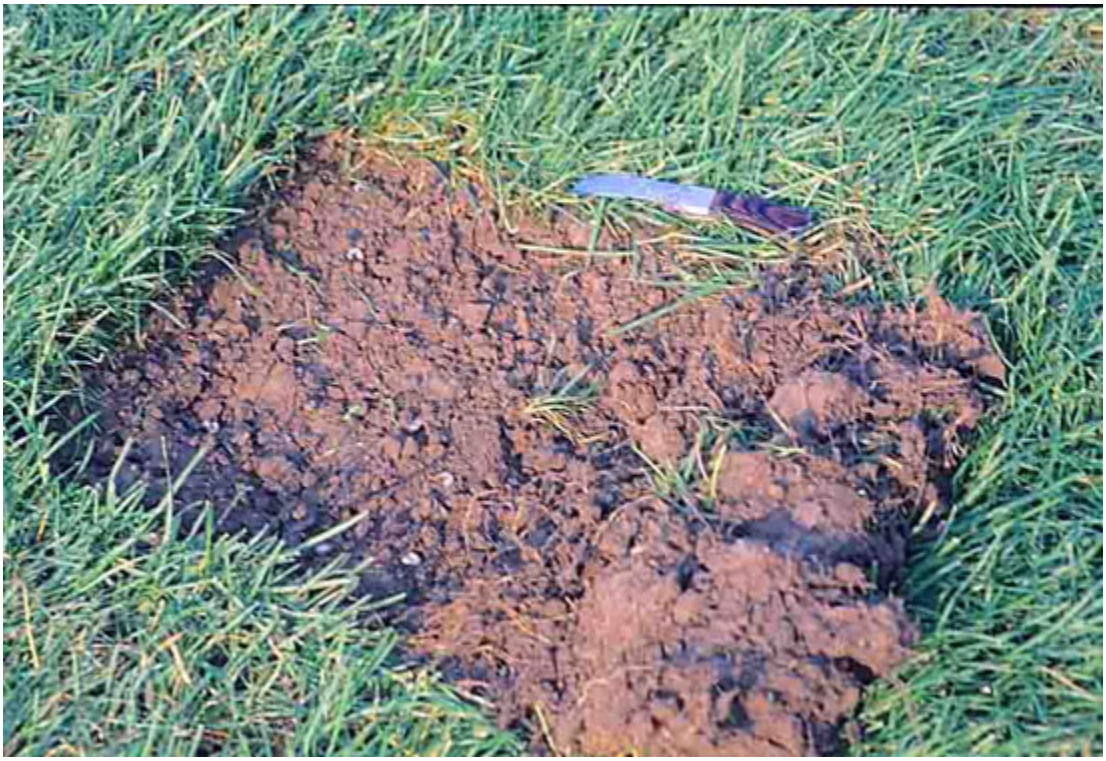
HYG articles August 24, 2020

White grubs

White grub is a common name for the larvae of June beetles, chafers and Japanese beetles that feed on the roots of turfgrass. The grubs can be found in the first 8 inches of soil beneath turfgrass. They are white, C-shaped larvae, about 1 inch long and have 6 jointed legs attached close to their small brown head capsule. Excessive root feeding by white grubs can leave turfgrass poorly anchored to the soil and can result in brown patches in a lawn that can be pulled back like a rug. This can impact the aesthetics of a lawn and, in some cases, can make sports fields less safe for children and athletes.

White grub, Alton N. Sparks, Jr., University of Georgia, Bugwood.org.

Scouting is the most important step in determining whether a treatment is necessary or economical. August is the best time to scout for grubs because young grubs are hatching and beginning to feed on grass roots. To scout for grubs, choose a location in the turfgrass that is near pavement and away from trees. Cut a 1 sq.ft. patch of turfgrass and roll it back to expose the grubs below. If you find 10 – 12 grubs or more in those patches, you have enough insects to cause significant injury and can apply a treatment to the turfgrass.



White grub scouting, Phil Nixon, University of Illinois at Urbana-Champaign.

Chemical Controls:
Neonicotinoids (Merit, Arena, Meridian) are systemic insecticide, meaning they are taken up by and transported within the grass plants. When grubs feed on grass roots they take in the insecticide and are killed. These systemic insecticides can remain active within the turfgrass for up to 3 months. Because these products are transported within the plant, they have the potential to harm pollinators visiting treated plants. It is important to avoid applying neonicotinoids to flowering plants (including clover and weeds) to prevent pollinator exposure.

Trichlorfon (Dylox) is an effective and short acting treatment for white grubs. It can be purchased as a granular formulation that must be incorporated, watered-in to the turfgrass.

Chlorantraniliprole (Acelepryn) is a more selective insecticide that can provide control for white grubs and some caterpillars that feed on turfgrass but has a lower risk of harming pollinators like bees. It can be applied as either a spray or granular formulation.

If a treatment without synthetic active ingredients is preferred, biological or cultural controls can be used.

Biological Controls:
GrubGone!® is a microbial product that can be an effective option in controlling white grubs. The active ingredient, Bt galleriae (*Bacillus thuringiensis galleriae*), is a soil microbe that damages the gut of beetle larvae when it is consumed.

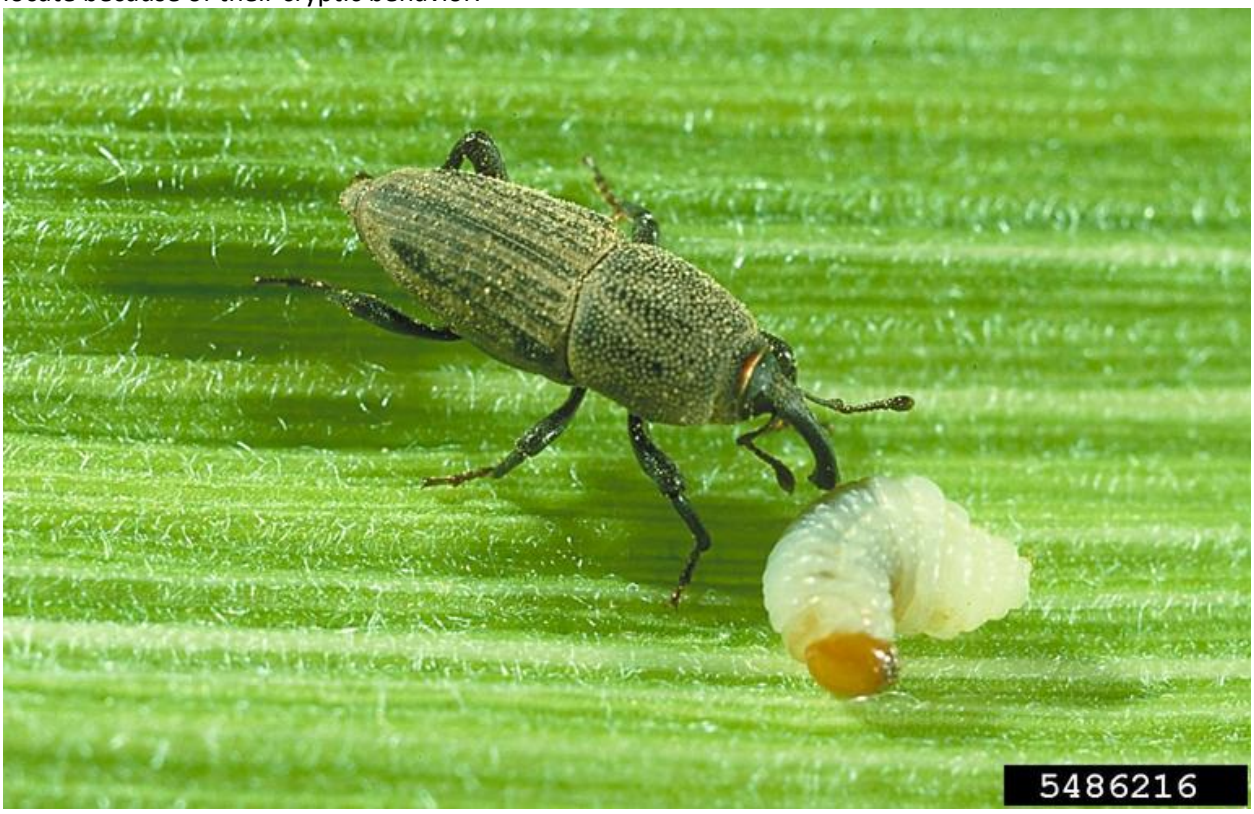
Cultural Controls:

Another strategy is to make turfgrass less attractive by reducing irrigation during late July and early Aug. At this time, adult beetles are actively mating a depositing eggs and well-irrigated turfgrass is the most attractive location for egg-laying. This is the safest and cheapest option but may result in some browning from lack of water during the hottest part of the summer. This option may not be possible in locations like golf courses, where green grass is required

(Sarah Hughson)

Billbugs

Adult billbugs are small weevils, about 3/8 of an inch long. They can range from brown to black in coloration and have the distinct long snout and hard wing covers that are characteristic of weevils. Adult billbugs spend much of their time in the soil, feeding on grass roots. When they are above ground, they usually do not fly and may be seen walking along driveways and sidewalks. Because they do not fly, billbug damage usually does not spread to new areas.
Adults chew holes in grass stems where they lay eggs. After hatching, billbug larvae begin to tunnel and feed within the grass stems and rhizomes. They eventually emerge from the plants into the soil where they feed on the roots. Billbug larvae are white and C-shaped. They are easily differentiated from white grubs because they are leg-less and much smaller, measuring up to ½ an inch. They may be difficult to locate because of their cryptic behavior.



Bluegrass billbug (Sphenophorus parvulus) adult and larva, David Shetlar, The Ohio State University, Bugwood.org.

Adult billbugs usually do not cause noticeable injury to turfgrass but the larvae can cause significant feeding damage. Billbug injury appears as browning, straw-like turf in two to three inches round

patches. To differentiate billbug injury from that of other insects, you can use the "tug test." If the injured turf is pulled, it will break easily. The individual grass plants will have holes in the stems and small brown pellets of frass may be found around the stems of the grass plants. If 10 or more billbug larvae are found per square foot of turfgrass, action can be taken to control the insect and prevent further injury.

Injury from billbug larval feeding usually becomes visible in late July and early August. However, the best time to treat for billbugs is in early June, while larvae are young. By August, the larvae begin moving into their pupal phase. As pupae, billbugs will no longer feed on the grass and will not take in a treatment applied at that time.

Chemical controls for billbugs include chlorantroniliprole (Acelepryn) and trichlorfon (Dylox) provide control within a few days. Chlorantroniliprole poses a lower risk to pollinators than many other chemical controls and trichlorfon can be used in areas where a short-acting pesticide is preferred. Longer acting, systemic insecticides including imidacloprid (Merit), clothianidin (Arena) and thiamethoxam (Meridian) may take a couple of weeks to control the insects but will persist within the plants for some time. It is important to avoid applying neonicotinoid insecticides to lawns that have a mix of turfgrass and clover, to protect the bees and other pollinators that visit the flowers.

Nematodes that attack larvae, such as *Heterohabditis bacteriophora*, can provide good protection in a few days and may be more effective on more mature larvae. Nematodes will provide about 60% control while chemical controls may provide 95% control. Both options provide good protection since the insects do not need to be completely eradicated from the area to prevent economic damage.

(Sarah Hughson)

Magnolia Scale

Magnolia scale (*Neolecanium carnuparvum*) is a pest of magnolia, including star, cucumbertree, saucer and lily magnolias in northern and central Illinois. This insect can produce a large amount of honeydew, making leaves and branches shiny and sticky. The honeydew can promote sooty mold growth on the affected area, turning leaves and branches dark gray or black. If large populations of scales are present, honeydew can also coat lawn furniture or cars below the magnolia tree causing additional nuisance.

Sooty mold on magnolia, Sarah Vanek, Bugwood.org (Left), Magnolia Scale (Neolecanium carnuparvum), William Fountain, University of Kentucky, Bugwood.org (Right)

The female scales can be easily identified because they are among the largest scales in Illinois, growing up to ½ inch in diameter, though many do not reach maximum size. The color of the scales are variable ranging from white or yellow color to light brown or gray. The scales are usually round or slightly oblong. Magnolia scale has one generation per year with adults appearing during the summer. Young crawlers hatch and begin to emerge from beneath the female scales in late summer to early fall. The crawlers grow and feed on the plants for a time, overwinter and begin to feed again in the spring.

Treatments are most effective when applied to young crawlers emerging in late summer to early fall. Inspect the underside of one and two-year-old branches for crawlers. They can be identified as small gray to reddish-brown specks moving on the branches. If crawlers are present, you can treat for magnolia scale. Because magnolia scale overwinters in the crawler stage, there is also an opportunity to treat in the spring, at bud break, if you miss the fall emergence window.

As with other scale species, some of the best treatments are summer oils and insecticidal soaps. Coverage is key to ensuring the crawlers come in contact with the treatments, especially in areas like the undersides of twigs where crawlers are most abundant.

Chemical controls like acephate (Orthene, Lepitect) can be applied as a foliar spray or soil drench. However, neonicotinoid treatments like imidacloprid (Merit, others) and dinotefuran (Safari) are not recommended to treat magnolia scale because they have not shown to consistently control this pest and pose a risk to non-target insects that visit magnolias.

Remember that existing adult scales will remain attached to the tree even if the scale below is dead, so don't be discouraged if scales are still visible after treatment. Treatment of crawlers prevents additional adult scale from accumulating on the magnolia.

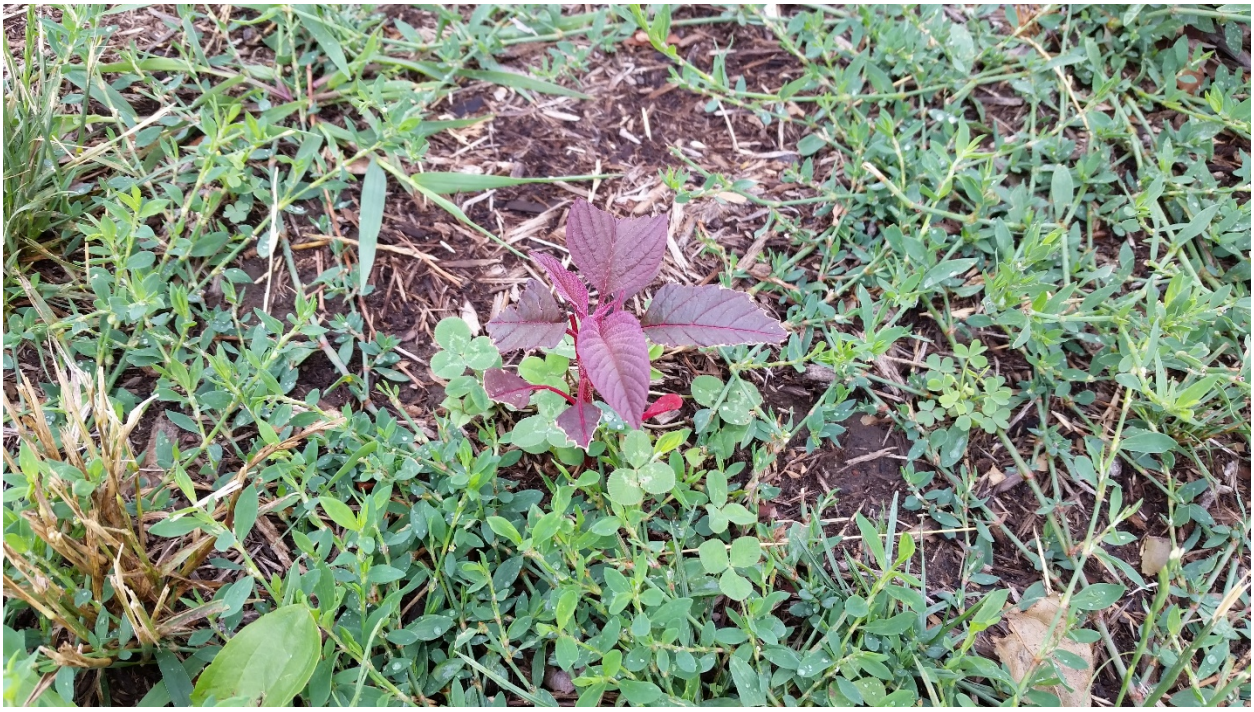
(Sarah Hughson)

Pigweeds (*Amaranthus* species) in the Landscape

Amaranthus species are commonly found in cultivated areas and landscape plantings throughout Illinois yet many are unfamiliar with them. The Midwest is home to several species including redroot pigweed (*Amaranthus retroflexus*), tall waterhemp (*A. tuberculatus*), Palmer amaranth (*A. palmeri*), tumble pigweed (*A. albus*), prostrate pigweed (*A. blitoides*), smooth (*A. hybridus*), spiny amaranth (*A. spinosus*), Powell amaranth (*A. powellii*), and others. All are similar in appearance with slight differences and cross-pollination can make identification quite difficult. All are summer annuals. In 2014, I warned landscapers and home gardeners about Palmer amaranth becoming a problem across the state in my article http://hyg.ipm.illinois.edu/article.php?id=609. For the sake of brevity, I'll limit our focus here primarily to redroot pigweed and make comparisons to similar species.

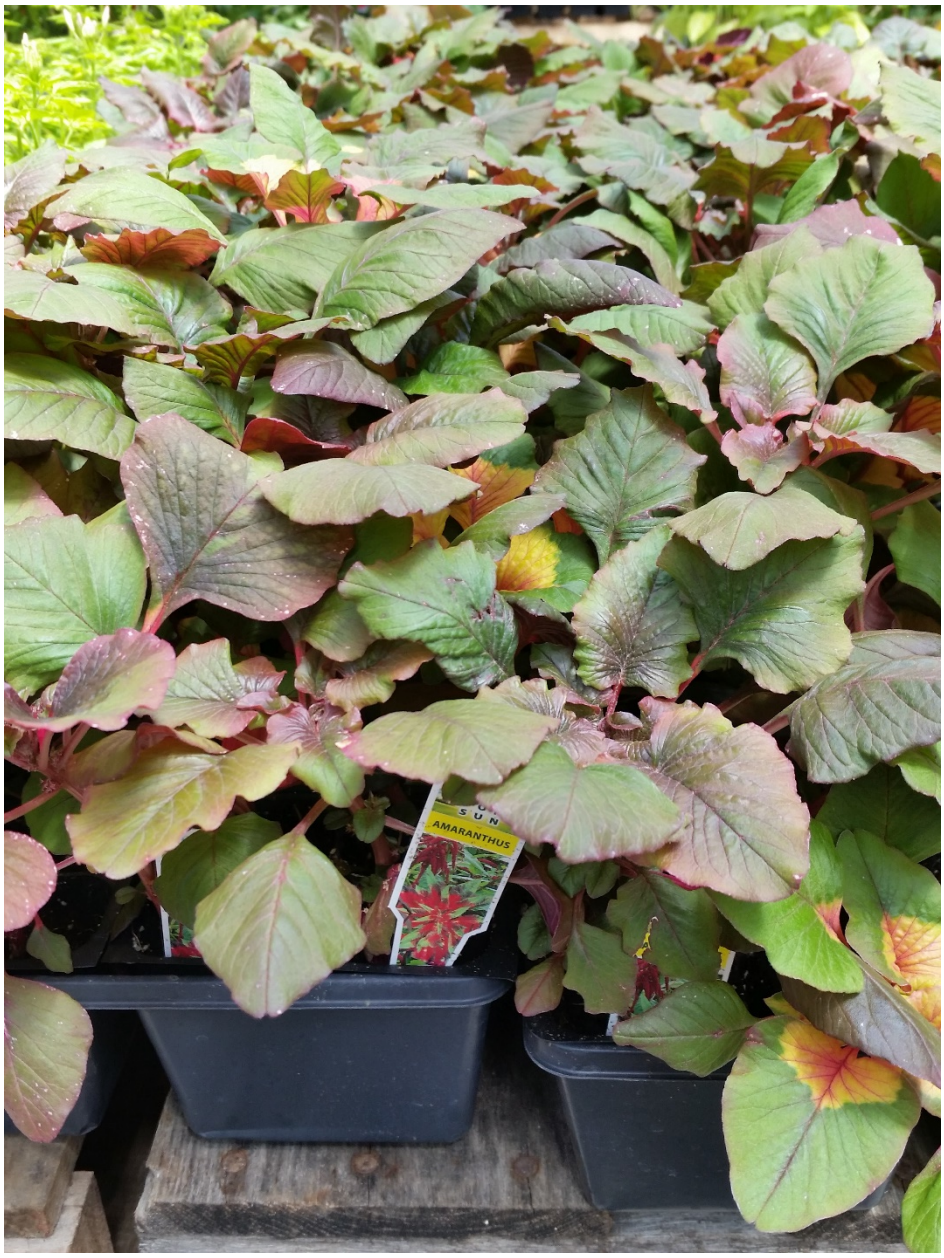
Pigweed growing along the edge of a field. Credit: Michelle Wiesbrook

Redroot pigweed grows erect and branching. It has a shallow, reddish taproot; hence the name. If left to develop, this weed can grow 6 feet tall. The leaves are alternate, ovate, dull green with wavy margins and can grow up to 6 inches long. The leaves have notched tips and purple to pinkish midveins and undersides. The stems are very hairy and often reddish at the base. Lower stems may be smooth. The petioles have short stiff hairs and are purplish. The seed head is a bristly, stiff, spike-like terminal panicle. Flowers are small and greenish. Tall waterhemp and Palmer amaranth are quite similar to redroot pigweed. However, tall waterhemp leaves and stems are hairless and smooth, even waxy, and the leaves are narrower. Palmer amaranth also lacks hair, but the petiole is really long (often longer than the leaf blade) and a white or red V-shaped variegation may be present on the leaves. Spiny amaranth's stem has a pair of sharp spines at the base of most leaves. Often, it is not easy or possible to differentiate among some pigweed species when plants are seedlings. To complicate matters, ornamental Amaranthus cultivars with brightly colored inflorescences and sometimes leaves are available for sale in the nursery trade. They too can become weedy and spread where they are not wanted. For more detailed information on pigweed identification, which focuses on floral characteristics, please see this 2001 article at http://bulletin.ipm.illinois.edu/pastpest/articles/200122g.html.



Ornamental amaranth growing in a landscape. Credit: Michelle Wiesbrook

Pigweeds grow best in fertile, sunny areas but can tolerate a variety of soil types. It is important to control pigweeds prior to seed production as one plant can produce hundreds of thousands of seeds. On average, pigweeds produce 13,000 to 35,000 seeds per plant according to colleagues at Michigan State University. However, reports from Iowa State University state that waterhemp plants can produce over 2 million seeds. Either way, that's a lot of seeds. Prevention is imperative.



Ornamental amaranth for sale in a nursery. Credit: Michelle Wiesbrook

In landscape beds, pigweeds can be removed by hand. Of course smaller plants will be much easier to uproot than larger plants. Good soil moisture will help the removal process so wait a day or so after a rain to make your task much simpler with less effort (and less mud possibly). Large plants can be cut down at the base of the stem. Mowing and trimming can be effective, however, I've seen some pigweeds handle a fair amount of mowing. It's rare to see it growing in turfgrass, however. Mulch or other groundcovers can be used in beds to block sunlight and thus prevent seed germination. Preemergent herbicide options include but are not limited to the following: benefin, dimethenamid, flumioxazin, isoxaben, oryzalin, oxyfluorfen, pendimethalin, prodiamine, and trifluralin. Combination products are available.

Palmer Amaranth's TALL seedheads. Credit: Michelle Wiesbrook

Postemergent options can be challenging. For best results, plant size should be very small. Early summer would be best for these applications. Glyphosate can perhaps be used successfully unless resistance to this herbicide has evolved. I have had clients in rural areas with the problem of seed spread from neighboring agricultural crops. Repeated use of glyphosate to control Amaranthus species over time has resulted in populations that have evolved resistance to this active ingredient. So the homeowner who uses glyphosate (even for the first time) to control these weeds will not have much success unfortunately. In these situations, if plants are small (less than 4 inches) glufosinate can be used, but odds are good that this late in the year plants will be too large. Yes, it is similar sounding but an entirely different chemical. Depending on the area, dicamba or 2,4-D may be possible options. Please note that these products cannot be used in certain areas such as vegetable gardens or around sensitive plants as extensive plant damage can occur. When using any herbicide, be sure to carefully read and follow all label directions including information on resistance management. Tall waterhemp that is resistant to 2,4-D has been reported. In Illinois, there have been reports of resistance to several herbicide sites of action with tall waterhemp, Palmer amaranth, and smooth pigweed. For more information, check out: http://www.weedscience.org/Pages/USState.aspx?StateAbbr=IL.

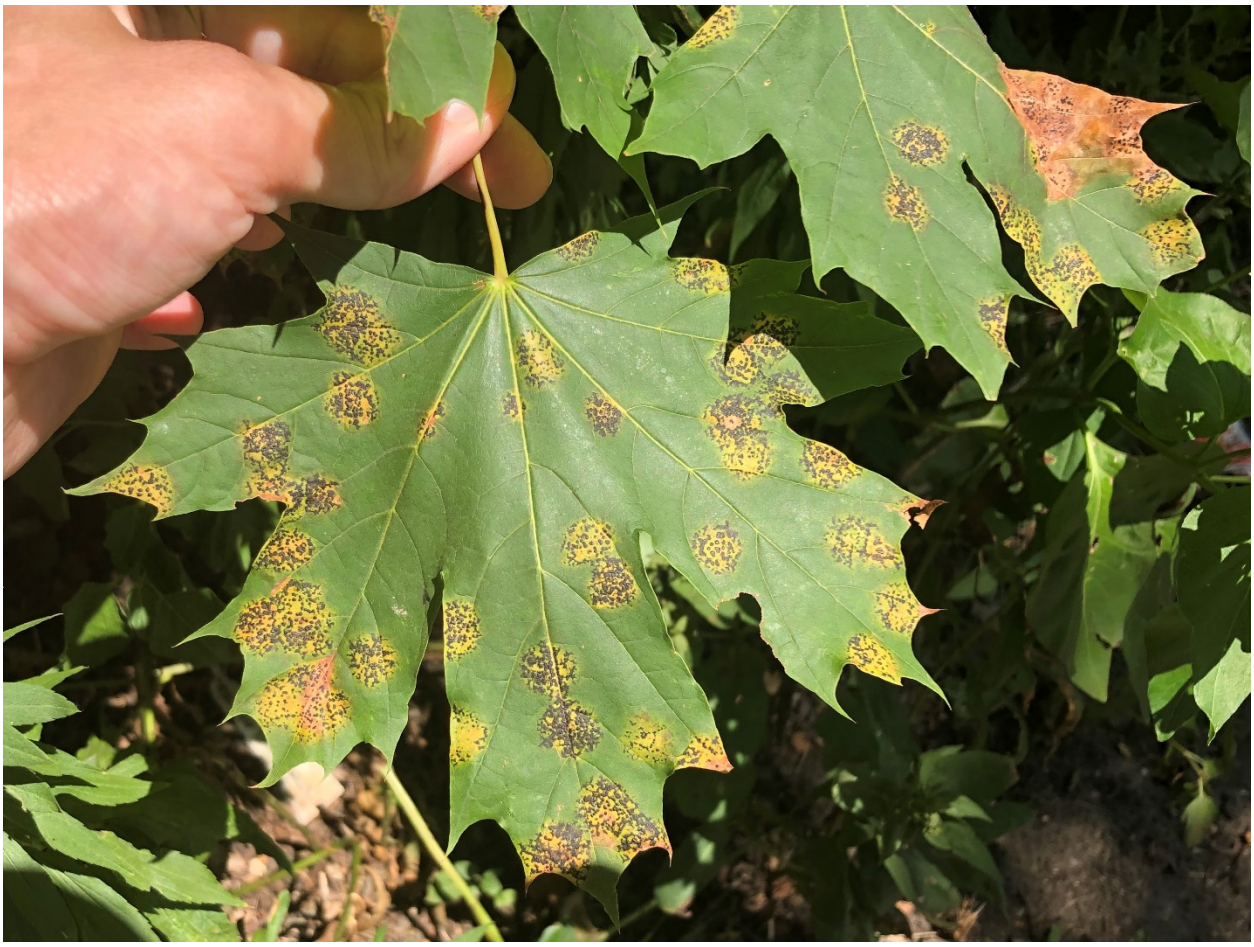
Michelle Wiesbrook

Resources:

- *Weeds of the Northeast*
- https://www.canr.msu.edu/weeds/extension/pigweeds-redroot-pigweed-smooth-pigweed-and-powell-amaranth
- https://crops.extension.iastate.edu/encyclopedia/palmer-amaranth-id-biology-and-management

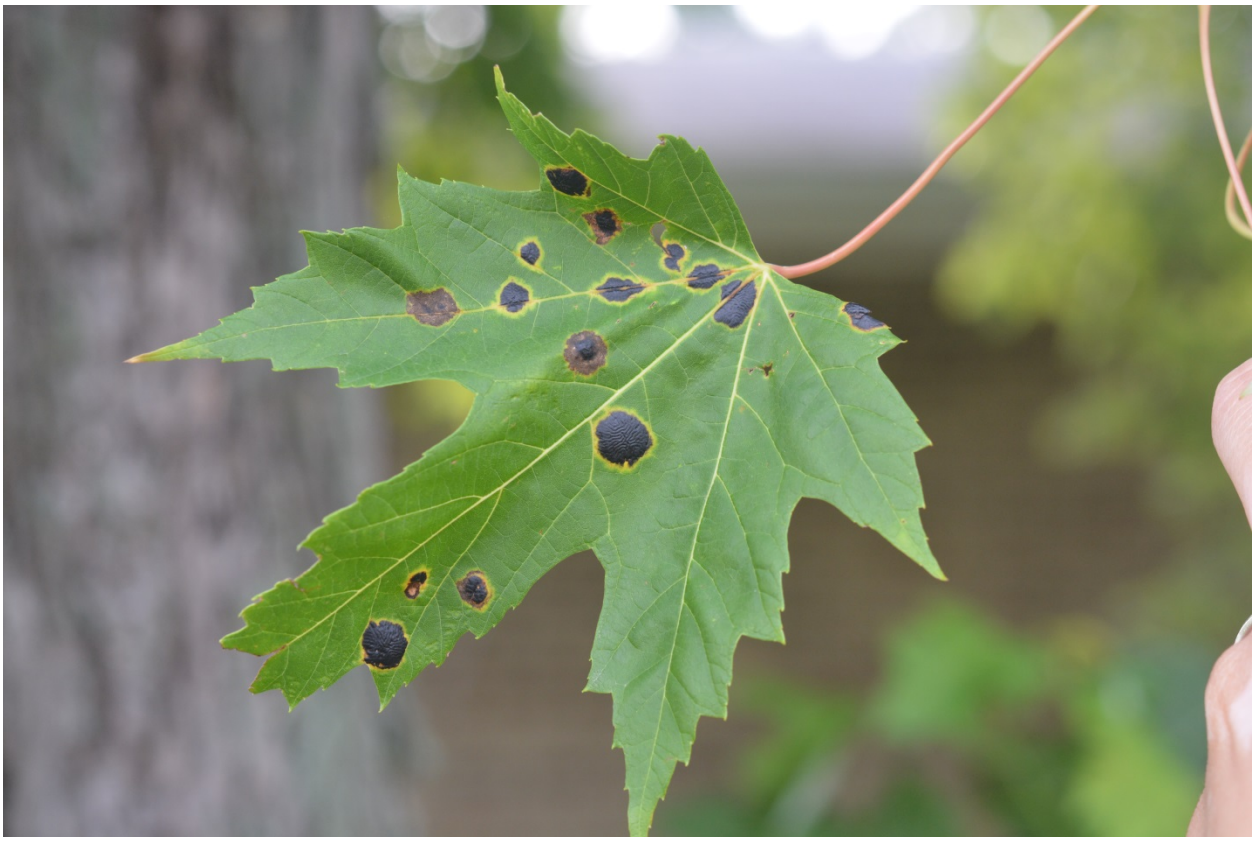
Tar Spots of Maple

Tar spots are now evident on many maple species. I recently traveled to northern Illinois where nearly every Norway maple that I came across had tar spot symptoms. Fungi in the genus *Rhytisma* cause this disease.



Tar spot on Norway maple

Tar spots are appropriately named for the raised, black spots that develop on the upper surfaces of affected leaves, which resemble splattered tar. The symptoms initially appear in mid-June as small, pale yellow spots. By mid-July, the yellow spots expand and a thick, raised, black stromata starts to form within the spot. Then, by late summer, the affected leaves develop the characteristic tar spot symptoms. When severe, the disease may cause some premature defoliation. Fortunately, injury resulting from tar spot infections is mostly aesthetic and rarely affects the host tree's overall health.



Tar spot on Silver Maple

Tar spot outbreaks have been more frequent in recent years, likely due to moist spring weather with above average rainfall. Trees that are damaged on an annual basis tend to be located in moist, sheltered sites that provide an ideal environment for the pathogen. Tar spot fungi overwinter on infected leaf debris. In the spring, overwintering fungal fruiting bodies ripen and eject spores. Wind then carries the spores to nearby developing leaves of susceptible hosts where the infection occurs.

Disease management practices are rarely warranted. When necessary, the first step is to rake and destroy leaf debris in the fall or early spring. This practice will help reduce spores capable of causing new infections. Fungicides containing the active ingredient Mancozeb (Fore 80 WP or Protect DF) or Copper Hydroxide (CuPro 500) can be used to protect newly developing leaves from infection. Begin sprays when the leaf buds are opening and re-apply twice more at 10-day intervals. Results from tar spot research on Norway maples in Canada suggested that one fungicide application, just prior to full leaf expansion, may provide sufficient control for this disease on Norway maples.

(Travis Cleveland)

Bergdahl, aaron D., and Hill, alison, tech. coords. 2016. *Diseases of Trees in the Great Plains*. gen. Tech. Rep. RMRS-gTR-335. Fort Collins, CO: U.S. Department of agriculture, Forest Service, Rocky Mountain Research Station.

Hsiang, T.; Tian, X.L. 2007. Sporulation and identity of tar spot of maple in Canada. Acta Silvatica & Lignaria Hungary. Special Edition: 71–74.

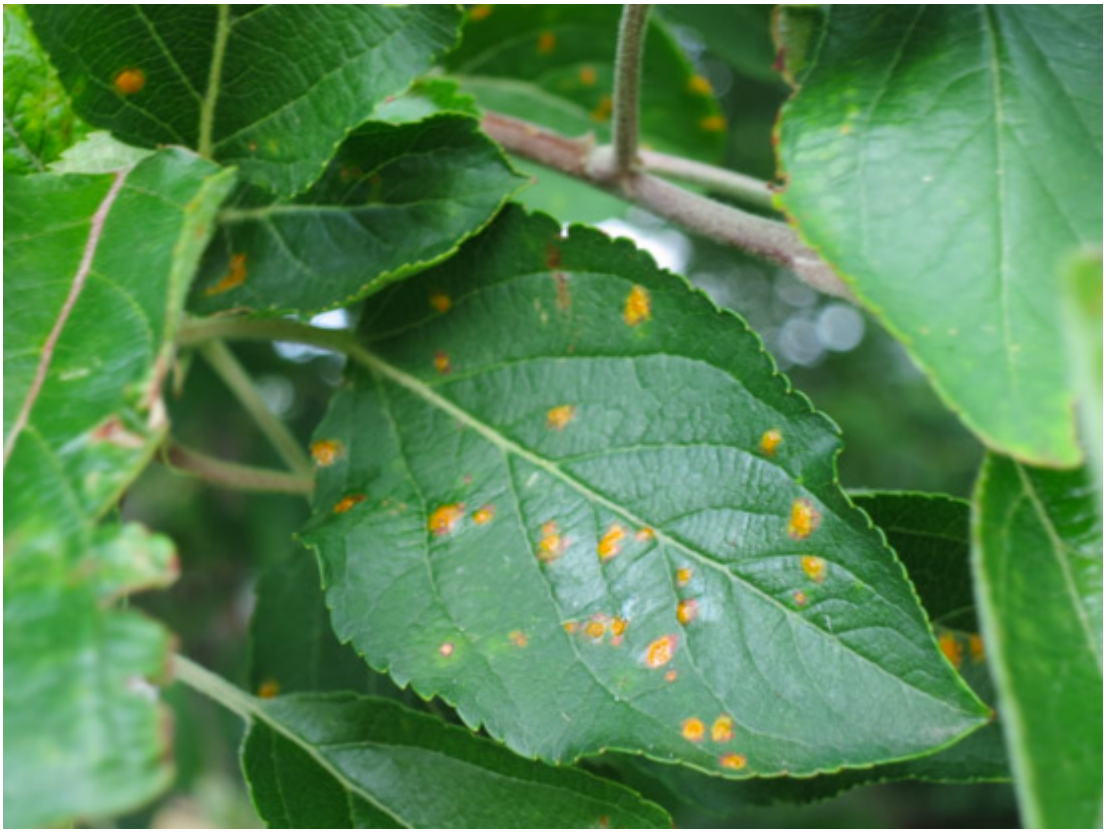
Gymnosporangium Rusts on Apples, Crabapples, and Hawthorns

Diane Plewa wrote about Pear Trellis Rust in Issue 8 of this newsletter. A few closely related rust diseases have also wreaked havoc on apples, crabapples, and hawthorns this growing season. I recently observed numerous hawthorns that were entirely defoliated by severe rust infections.

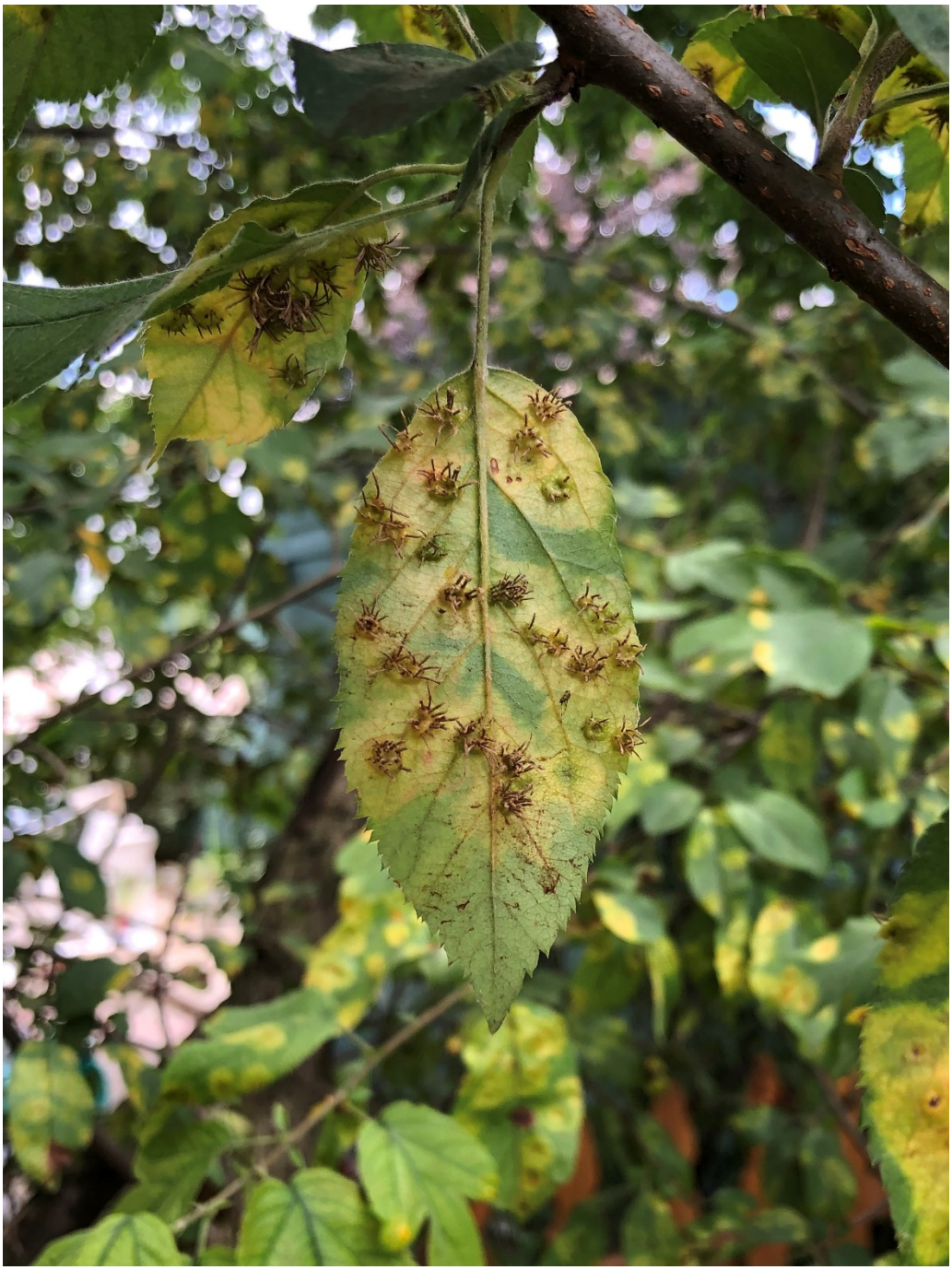
Three cedar rust diseases commonly occur in Illinois:

- Cedar-apple rust (*Gymnosporangium juniperi-virginianae*)
- Cedar-hawthorn rust (*Gymnosporangium globosum*)
- Cedar-quince rust (*Gymnosporangium clavipes*)

Cedar-apple rust is the most common of the above three. Infections can occur on leaves, fruits and twigs of apples and crabapples. For ornamental trees, leaf symptoms are more of a problem than affected stems and fruits. Leaf symptoms first appear in May and June as pale yellow spots on the upper leaf surface. The spots eventually enlarge and turn orange in color. They will also begin to appear on the underside of the leaf, eventually forming tube-like structures (aecia). Infections may result in yellowing leaves and defoliation.



Cedar-apple rust on apple.



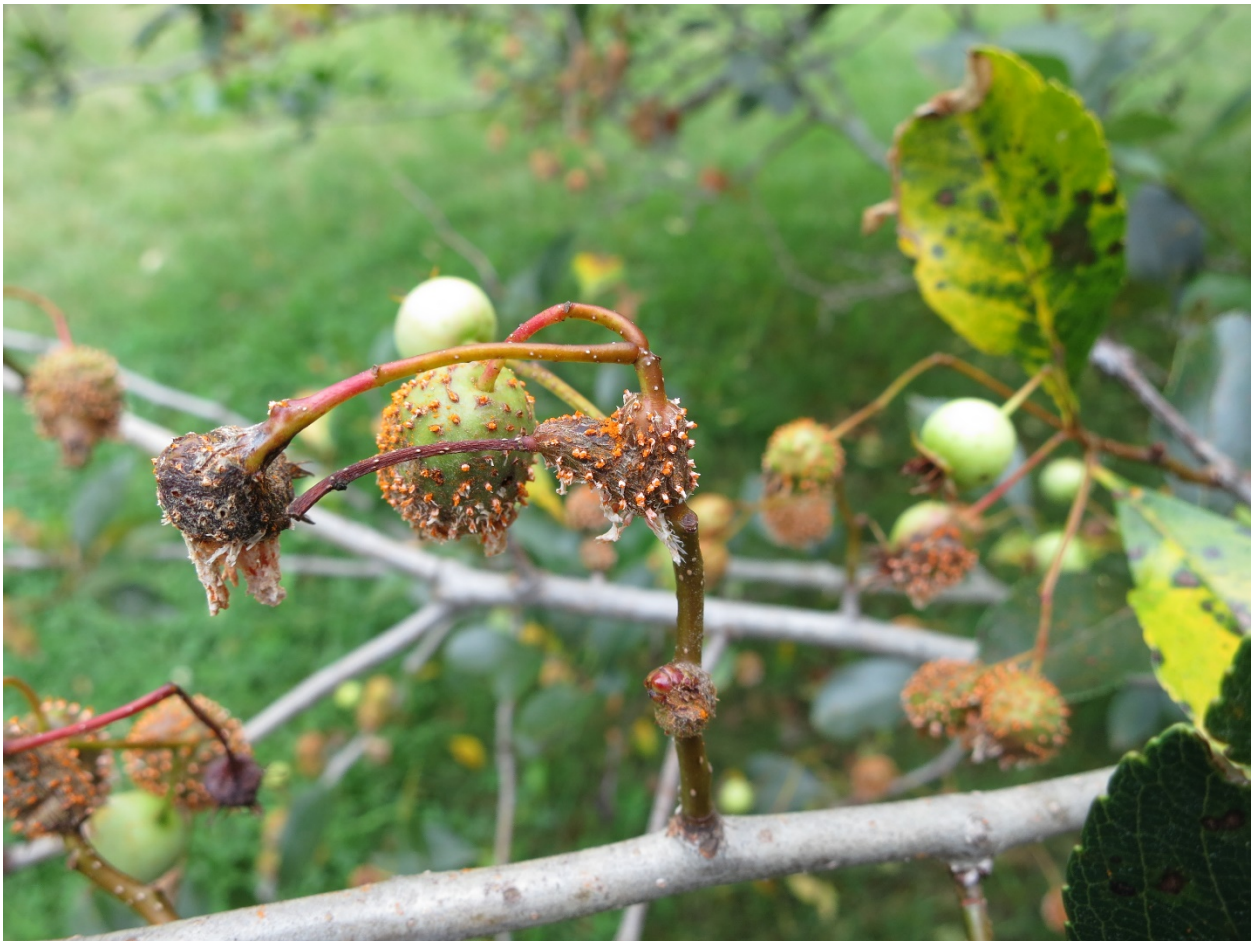
Tube-like structures (aecia) on the underside of a crabapple leaf

Cedar-hawthorn rust can infect several species within the rose family and can cause similar foliar symptoms to cedar-apple rust. The pathogen is considered minor on apple, crabapple, serviceberry and pears. However, the pathogen can cause severe disease on certain hawthorn species (*Crataegus spp.*). The downy hawthorn (*C. mollis*) is considered very susceptible to this disease, while infections seem to be less severe on hawthorn species with glossy leaf surfaces (*C. crusgalli, C.viridis* 'Winter King'). This rust disease most often affects leaves, causing yellow spots that enlarge eventually and develop a gray-brown color. Severely infected hawthorn leaves often turn bright yellow before dropping prematurely.

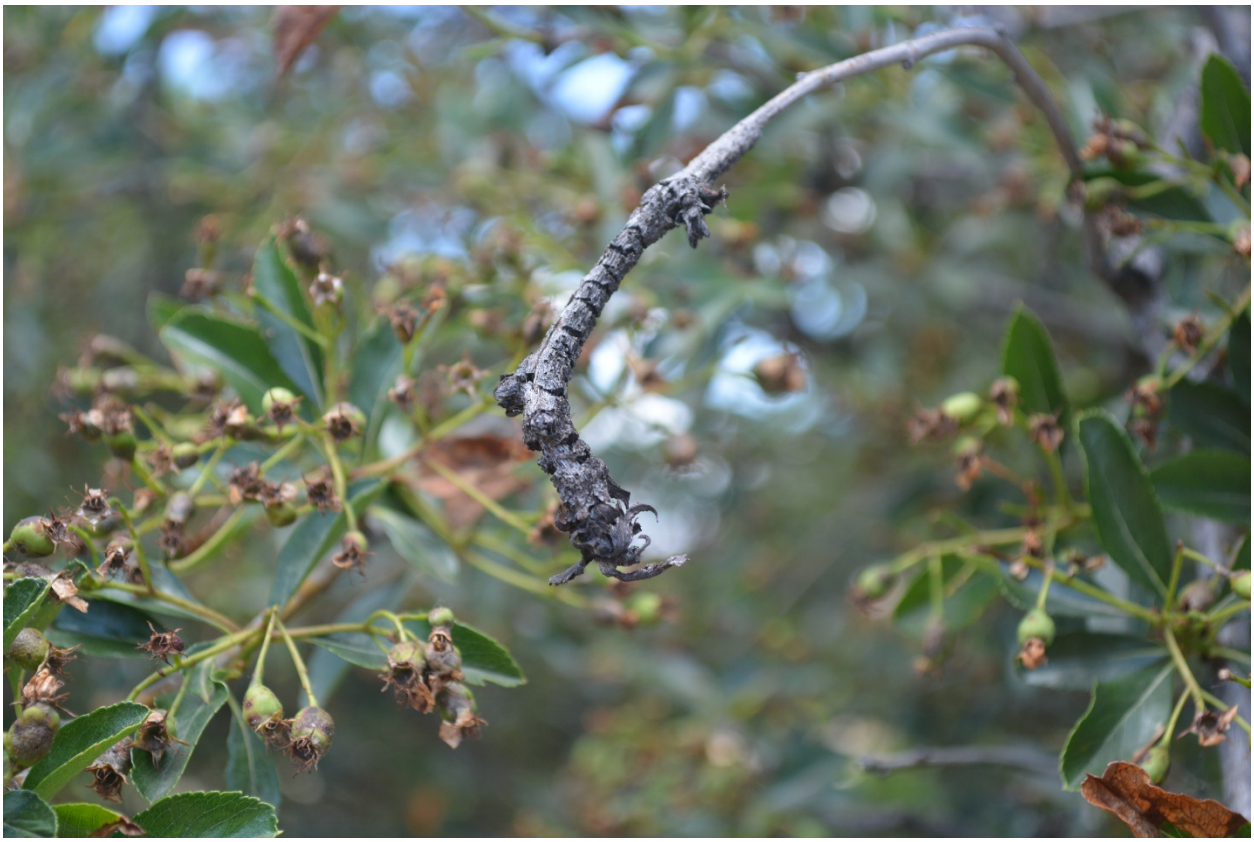
This pathogen can also damage fruits and twigs. However, this type of injury is more likely the result of cedar-quince rust.

Cedar-hawthorn rust on Downy Hawthorn (Crataegus mollis).

Cedar-quince rust will also infect various members of the rose family. Serviceberry, chokeberry, quince, hawthorn, and apple are some of the more noteworthy hosts. Leaf symptoms for this disease are limited to infections of petioles and veins. This pathogen causes noticeable damage to stems, thorns and fruits of susceptible species. Stems and thorns may become enlarged and deformed. Fungal aecia cover infected fruit, giving them an orange, fringed appearance.



Cedar-quince rust on hawthorn. Stem and fruit infections.



Cedar-quince rust on hawthorn. Old branch swelling from previous season's infection.

Control

Most homeowners tolerate the injury caused by rust diseases. When controls are warranted, start with cultural practices. Remove any nearby, unwanted juniper hosts, or prune out galls from the infected branches. Be aware that spores may still blow in from neighboring properties. Select rust-resistant cultivars when planting new apples, crabapples, or hawthorns. If cedar rust diseases are a yearly problem, consider protecting high-value plants with fungicides. It is too late to protect this year's growth. Mark your calendars with a reminder to apply fungicides early next spring to protect new growth. Most fungicides are considered to be low risk to bees and other pollinators. However, some fungicides are known to synergize with other pesticides and products within the spray tank, potentially increasing their toxicity to bees. If you must apply a fungicide during bloom, we recommend selecting a pesticide that has the least toxicity to bees but is still effective against the target pest.
The Pollinator Network at Cornell University published a useful guide to help applicators select lower-risk pesticides for pollinators in landscape, ornamental & turf management:
A Pesticide Decision-Making Guide to Protect Pollinators in Landscape, Ornamental and Turf Management

(Travis Cleveland)