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White Grubs

The recent hot, dry weather and more of the same predicted has set us up for white grub damage to turfgrass this year. How severe will not be very predictable until early August when most of the grubs have hatched.

Basic to this question is where the eggs were laid and how many were laid. Masked chafer adult beetle emergence tends to be relatively constant in the state as the larvae are less dependent on soil moisture and dig deep enough in the winter to escape deeply frozen soils. Japanese beetle numbers vary more widely from year to year as they are impacted more by these factors. In areas where Japanese beetles are located, they tend to become the dominant white grub species anyway.

Japanese beetles are numerous in the eastern one to two counties of Illinois from Lake County in the northeastern corner south to Saline and Gallatin Counties where the Ohio River becomes the southern border of the state. They are also numerous in the Collinsville and Edwardsville areas of southwestern Illinois. Elsewhere, they are numerous in all Illinois cities and are spreading through the adjoining countryside.

Although Japanese beetles in east central Illinois are only about one-quarter of the maximum number that

we have experienced in previous years, they appear to be present in heavy numbers in most of the rest of the state. In general, Japanese beetles emerged about a week early this year and closer to two weeks early in northern Illinois. This is good news for larval turf damage as most of the eggs were probably laid by early to mid-July.

White grub adults, including Japanese beetles, tunnel into the soil about one to two inches to lay their eggs. They prefer moist soil that is easy to dig into and are repelled by dry soil. There is also some evidence that they are attracted to lush, green grass over brown, dormant turf. Our heavy spring rainfall pattern continued through much of June, resulting in lush, green grass in non-irrigated areas into early to mid-July. Under these conditions, white grub adults lay their eggs in all turf areas. In normal rainfall years, non-irrigated turf is dry, brown, and dormant in July, so the beetles lay most of their eggs in irrigated turfgrass. This concentrates the white grub and resulting damage in these areas.

The early emergence of Japanese beetles this year when turf was lush and green makes it even more likely that the egg-laying was widespread. If that is the case, most turf areas will have white grubs, but they are likely to be below the damaging level of ten to twelve per square foot and treatment is unlikely to be needed. If the turf is heavily used, grub damage is likely

to occur even at numbers slightly below this threshold because stressed turf will replace grub-eaten roots more slowly. If the turf is only lightly used, grub numbers may be as high as 15-18 grubs per square foot without developing brownish areas from grub feeding.

By the end of the first week of August, most of grubs will have hatched. Scout for grubs by cutting through the turf with a stout knife and prying it up. A few grubs are likely to be in the sod, but most will be exposed on the soil surface. White grubs are C-shaped, white scarab larvae with six legs, and brown heads. The ones that are the larval stages of Japanese beetle and masked chafers grow to about one inch in length, but in early August are usually about one-quarter inch long. Till the soil with the knife to reveal any grubs below the main root zone. In moist turf, the grubs will typically be within two inches below the sod; in dry soils, the grubs are likely to be four to six inches deep. Once the grubs are counted, replace the sod and tamp it down with your foot. Watering the area reduces the likelihood of brown patches where the sod was disturbed.

If high grub populations are present or expected, application of a long-lasting white grub insecticide is recommended. This includes chlorantroniliprole (Acelepryn), clothianidin (Arena), imidacloprid (Merit), or thiamethoxam (Meridian). In recent years, we have also recommended halofenozide (Mach 2) for this application. However, widespread failures of this product across the U.S. have been reported, possibly due to microbial degradation. In microbial degradation, microbes adapt to eat the pesticide. If you have had good results with Mach 2 in the

past, feel free to continue using it but rotation with at least one other of the above insecticides on a yearly basis is recommended. If you have had treatment failures with Mach 2, microbial degradation may be the cause.

We generally recommend that these insecticides be applied during July as some can take two to three weeks to kill the grubs. Apparently, the grubs stop feeding soon after insecticide application so there is little threat of turf damage. The concern is that the client may check on the grubs and discover that they are still alive, resulting in unnecessary callbacks. For this reason, trichlorfon (Dylox) is usually recommended when grubs are present as it will kill the grubs within three days. However, it only lasts for five days so it should not be applied before grubs have hatched. Any grub insecticide application is more effective when watered in with at least one-half inch of water. (*Phil Nixon*)

Green June Beetle

Green June beetle adults have been reported in large numbers. These beetles are stocky, green, and about three-fourths inch long. They make a loud buzzing sound when they fly and apparently prefer to fly into upright objects, including people. They are most active on warm, sunny days and are present from Peoria on south in Illinois. They feed on flower pollen and are commonly found on flowers. They also feed on soft fruits, causing severe damage to ripening peaches.

Their larvae live on dead grass, being common in piles of grass clippings, piles

of horse manure, and in turf. The larvae grow to about two inches long and appear similar to white grubs except that they are less likely to be C-shaped when found. They have an interesting habit of foraging above ground at night where they are sometimes spotted on sidewalks. They have shorter legs than other white grubs, so they flip over and crawl on their backs. They use long setae on their backs to grip the surface as they crawl.

When feeding in turf, they tend to be present in higher numbers under trees. They leave one-half inch diameter holes in the soil when they come out of the soil to forage at night. Because they feed on dead grass blades, they do not do direct damage to turf but can loosen the roots as they feed. If treatment is needed, watering in an application of carbaryl (Sevin) or applying a white grub insecticide application will provide control.

Areas with green June beetle grubs commonly have large numbers of scoliid wasps whose larvae feed on them. Scoliid wasps are black and red with yellow spots on the abdomen. They are about one inch long and have bluish transparent wings. They are quite active during the day flying low over the turf. Although fearsome looking, they are reluctant stingers. (*Phil Nixon*)

Cicada Killer

Cicada killers have recently emerged in central Illinois. These one and one-half inch long wasps are black and cream with transparent reddish wings. A female cicada killer captures an annual cicada that it paralyzes by stinging, drags it down into her underground burrow, and lays an egg on it. The resulting wasp larva

consumes the still living cicada and then pupates for the winter, emerging as an adult wasp the next summer. Females are very unlikely to sting unless handled or stepped on. Males cannot sting but look like the females and maintain aerial territories which they patrol. The males terrorize golfers as the females prefer the edges of sand traps for their one-half inch diameter burrows. Keeping sandboxes covered keeps them out. They also burrow in lawns, preferring bare soil or mulched areas. If they cannot be understood or ignored, carbaryl (Sevin Dust) applied around the burrow entrances will kill the females. Once the females are gone, the males leave. (*Phil Nixon*)

Twospotted Spidermite

Twospotted spidermites become numerous and thrive in hot, dry weather. They are attacked and killed by fungal diseases that do better in moist conditions. The spidermites take longer to grow up in cooler conditions, giving the fungi more time to kill the mites.

Twospotted spidermites are recognized easiest by the damage that they cause. They and the related oak mite and honeylocust mite feed on broadleaved plants, both deciduous and evergreen. Damage appears as light, stippled areas that later turn brown on the upper and lower leaf surfaces. The mites live primarily on the leaf undersides, giving the leaf underside a slightly dirty appearance. Close examination with a hand lens reveals the eight-legged mites and spherical whitish to yellowish eggs on the leaf underside along with very fine silk webbing. The eggs are similar in size to the adult mites which are so small that about 60 will fit on a pinhead.

Scout for spidermites by holding a white sheet of paper under the branch and hitting it sharply. This knocks mites off of the foliage onto the paper where they can be more easily seen. Spidermites tend to be grayish or greenish and slow-moving. Faster moving red or light-colored mites are usually predators of the spidermites. Twospotted spidermites are also called red spidermites, being red when they grow up in cool conditions. With these mites being summer pests, it is rare to find red twospotted spidermites in Illinois. Sliding your hand across the paper will crush the mites. Spidermites streak green and predatory mites streak red or white. Numerous predatory mites will probably control the spidermites without the need for miticide applications.

Spidermites are controlled with two or three miticide sprays applied at five to seven day intervals. Most miticides do not kill the eggs, so the repeated spray is meant to kill those that have hatched from the eggs before they become adults and lay more eggs. In hot weather, the mites grow up quickly, so a delay of only a day or two beyond a seven day spray interval is likely to require an additional spray application. Effective miticides include abamectin (Avid), acequinocyl (Shuttle), bifenthrin (Onyx, Talstar), etoxazole (TetraSan), hexythiazox (Hexygon), insecticidal soap, spiromesifen (Forbid), and summer oil. (Phil Nixon)

Got Wilt?

Hot, dry weather causes stress to plants as well as people. Wilting is a normal plant response to a lack of water, but

severe wilting, partial-plant wilting, and flagging are all symptoms of *Verticillium* wilt. This disease is common and recurring in Illinois. The causal fungi are found throughout the state. Plants that are stressed are more likely to be susceptible to the pathogen, and more likely to show symptoms.

The wilt disease is caused by several species of related fungi, with both *Verticillium dahlia* and *V. albo-atrum* found in Illinois. *Verticillium* attacks a wide range of plants including trees, shrubs, groundcovers, vegetables, fruits, and herbaceous ornamentals. Due to their wide host range and the fact that the fungus can survive in the soil for decades, this is a problematic pathogen for homeowners, commercial growers and farmers. The most commonly affected plants in Illinois include maple, redbud and ash trees.

Verticillium may be seed- or soil-borne. Roots are infected first as the fungus enters through wounds and grows into the cortex. Fungal spores are produced and systemically transported upwards in the xylem. The spores lodge within the vascular system of the plant and germinate, eventually plugging the xylem and restricting water flow within the plant. Wilting foliage and branch or plant dieback are common symptoms. Half of the plant may be affected while the other half appears normal. Other indications of *Verticillium* wilt are flagging, where leaves turn red one branch at a time, and leaf scorch.

The development of *Verticillium* wilt is associated with plant stress. During periods of hot, dry weather plants experience high levels of stress and may become more susceptible to infection.

Other frequent forms of stress include nearby construction, damage to the plant and, in trees, deep planting. Stress can also cause symptoms to develop or become more pronounced.

In woody plants, peeling back the bark of a wilting branch affected by Verticillium will usually show brown or green streaking (the exception is the ash tree, which can be affected without being discolored). In herbaceous plants, cutting open the stem will reveal dark brown or black streaked tissue.

Verticillium can be tested for at the University of Illinois Plant Clinic. If you suspect you have an affected plant, collect a sample containing live, symptomatic tissue. Check for streaking; all woody plants other than ash trees must contain this streaking to effectively isolate the fungus. Ideally, branch samples have the same diameter as a thumb and are 8 to 10 inches long.

Unfortunately, control of this disease is very difficult once it has become established in a host. Most infected plants die, though reducing stress and actively increasing plant vitality by pruning out dead wood and applying appropriate fertilizers can extend an infected plant's lifespan. Several-year rotation is also recommended as a control strategy. Resistance to Verticillium has been developed in a few plant species, including strawberry, tomato and potato.

Why bother testing for Verticillium wilt if the prognosis is so poor? Often people wish to replace dead trees and shrubs. Verticillium fungi can persist in soil for several years, waiting for an appropriate host. Replacing a tree that died of Verticillium with another susceptible

species is an exercise in futility; instead, a resistant variety should be selected. Apple, Ginkgo, Juniper, Oak, Pear, Pine, Spruce, Sycamore, Walnut and Willow trees are all considered to be non-susceptible to Verticillium wilt. (*Diane Plewa, Suzanne Bissonnette*)

Rose Rosette: It is Still Lurking in Roses

What is Rose Rosette Disease?

Rose Rosette disease is caused by what is thought to be a "virus-like" disease or a double-stranded RNA and is known to affect plants in the Rose family. Multiflora rose, often considered to be an invasive plant species, is very susceptible to this disease. Many species or selections of cultivated roses can vary in susceptibility to this disease; however it is assumed that most cultivated roses can be susceptible to Rose Rosette Disease.

Unfortunately, there are no tests for this disease. But, the symptoms of this disease are very distinct; therefore a suspected diagnosis oftentimes can be based on symptomology. Symptoms of rose rosette disease may include thick, often redder than normal stems with many times the normal number of thorns. Multiple stems at the ends of branches produce witches' broom growth and often small, distorted, and chlorotic leaves as seen in the image.

But, we do have to be careful, because herbicides that come into contact with rose foliage can cause some similar symptoms to Rose Rosette; therefore be sure to investigate the use of herbicides near affected roses. Some herbicides

may cause the witches' brooms, distorted growth, and discoloration, but they do not cause prolific production of thorns.

How can your roses become infected by Rose Rosette Disease?

The vector of this disease is an eriophyid mite, a mite so small that you need a 10X or stronger power magnifying glass to see them. The presence of this vector can also help with diagnosis. In the lab, we use a dissecting microscope to view the new growth. As we pick apart the buds the mites can sometimes be found scurrying away from the light and heat. This disease is also transmitted by grafting.

What are the recommendations for treating this disease?

Plants with symptoms should be dug up and destroyed (including roots) when first noticed. It is strongly suggested that multiflora rose and garden roses be separated as far as possible from each other. The efficacy of mite control has

been questioned in control of this disease, but if miticides are used, research suggests that the critical mite-transmission time is May and June, so concentrate your efforts in those months.

Will roses die from this disease and how quickly?

Currently, infected plants cannot be salvaged. This disease is believed to be fatal and plants can die about 22 months after infection.

Is replanting roses an option?

The soil itself is not infected, but roots and stems in the soil could be infected. The infected plants should be burned or bagged and removed from the site. This includes roots that might host the rose rosette pathogen. It should not be necessary to remove the soil. In some cases, if infected multiflora rose or ornamental rose plants with Rose Rosette are nearby, the vector (eriophyid mite) could continue to infect newly planted roses. (*Stephanie Porter*)