THE TOP SIX BUGS ON THE MOST NOT WANTED LIST

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Hairy Chinch Bug

Chinch bugs can injure lawns when conditions are warm and dry. Their damage is most frequently observed in July and August in central Michigan and is often attributed to some other agent. The presence of irregularly shaped yellow patches which turn brown and die is characteristic of chinch bug injury. Clumps of clover and other non-grass weeds may survive in these areas. Plant damage results not only from withdrawal of sap, but from chinch bug saliva which contains substances toxic to the plant.

Drought or heat stress may cause similar browning of turf, but proper watering will quickly rejuvenate the lawn. Turf injured by chinch bugs will not recover as quickly.

Adults are small black bugs, 3/16 inch long with white wings. Larvae are smaller than adults and wingless. The youngest larvae are brick red in color with a transverse white band on the back; larger larvae are mostly black. The most serious damage is caused by larvae feeding in late July. Adults overwinter in protected areas near lawns. They emerge in the late spring and early summer. When temperatures reach the 70's, they mate and lay eggs in the leaf sheaths of grass plants. Larvae require approximately four to six weeks to develop to the adult stage. First generation larvae occur in late June to July and second generation larvae are present in mid-August. Only one generation occurs in areas of Michigan north of Lansing.

Heavy rain in June and early July during egg hatch will reduce larval survival. Much of this mortality is due to a fungus (*Beauveria spp.*) that attacks the bugs during cool, wet conditions. The fungus is ineffective during hot dry periods when chinch bug populations build rapidly.

Another way to look for chinch bugs is to use a coffee can with the bottom removed. It can be pushed into the turf and filled with water. Chinch bugs will float to the surface after several minutes. This technique should be repeated five to six times in a lawn to detect uneven bug distributions.

Recent research in Michigan revealed that chinch bugs are widespread but rarely abundant enough to cause damage. In a survey of the Lansing area, less than five percent of the lawns visited had enough chinch bugs to cause damage. If more than 15 chinch bugs are found in two minutes of searching, or per coffee can sample, infested parts of a lawn can be sprayed with an insecticide. Granular insecticides are not as effective against chinch bugs as liquid sprays. Since chinch bugs are usually not a problem in well irrigated turf, diligent watering of turf during hot dry weather will help prevent chinch bug problems.

European Chafer

The European chafer may be the most serious grub pest of home lawns and low-maintenance turf. Although not as widespread as Japanese beetle, the European chafer grub is more damaging to turf in areas where both are found. The European chafer grub is slightly larger than the Japanese beetle grub. It feeds later into the fall and starts feeding again earlier in the spring.

European chafer adults are 1/2 inch long. Males and females are a uniform tan or light brown color. Larvae are typical C-shaped white grubs, reaching a maximum size of 6 mm wide and 23 mm long. The European chafer has a one-year life cycle. A small proportion of the population (<1%) may

require two years to complete development. Adult beetles emerge from the soil between the middle of June and early July in Michigan and New York. Emergence may be three weeks earlier in Ohio, Pennsylvania and New Jersey. They fly on warm (>65 F) evenings for several hours after sunset. Adult activity peaks within two to three weeks of first emergence. Eggs are deposited two to four inches below the soil surface. First instar grubs emerge from eggs in early August, molt and become second instars by the middle of August. By the first of September nearly all grubs are second instars (1/2 inch long), and by the 1st of October most grubs are third instars (3/4- to 1-inch long). They continue feeding on turf roots into November until the soil surface freezes. Overwintering grubs remain just below frozen soil. An average of 24 percent of the grubs do not survive the winter. Those who survive return to the surface as soon as the ground thaws, feeding on grass roots again in late winter and spring. By the first of June almost all of the grubs move down a depth of two to ten inches to pupate. They remain as pupae for about two weeks before emerging as adults. Wet soil during pupation may cause high mortality.

Japanese Beetle

The Japanese beetle grub is the most widespread grub pest of turf in the eastern United States. It is the most damaging insect pest of irrigated lawns.

Japanese beetle adults are a dark metallic green color, stout-bodied and approximately 1/2" long. They emerge in July and early August, feed on flowering fruit trees, roses, basswood and wild grape before mating and deposit their eggs in turf in August. Tiny larvae (1/16") hatch from eggs in August and begin feeding on turf roots. By late September the larvae have grown from 1/2" to 1" long and in heavy infestations cause root pruning damage to turf. In October when soil temperatures begin to drop, the C-shaped larvae or white grubs move down deeper into the soil to overwinter. The following spring, in April or May, they move back close to the surface and begin feeding again. Sometime in June the larvae quit feeding and pupate. They stay in a white pupal form for several weeks before emerging as adult beetles in July. The adult beetles are highly attracted to Japanese beetle traps. Traps are useful for monitoring adults to see if you have beetles in your area and to determine when they are active, but they do not provide any control.

June Beetle

At least six species of June beetles (*Phyllophaga* spp.) have been recovered from turf in Michigan. Immature beetles (larvae or grubs) are similar in appearance to the Japanese beetle and European chafer white grubs, however, June beetle larvae are larger, up to 2 inches long, and have an extended three year life cycle. A few serious June beetle infestations have been noted in scattered areas of Michigan. They are not, at present, a common or widespread lawn pest.

June beetle grubs feed on roots of all turfgrass species grown in Michigan. Infested turf initially appears wilted or yellow. More advanced symptoms, which may occur from May through September, consist of large irregularly shaped areas of brown turf. Birds, moles and skunks actively feed on grubs and in the process may tear up the turf as they search for them. Similar symptoms can result from Japanese beetle, European chafer and Bluegrass billbug injury.

The three year life cycle begins when adult beetles emerge from the soil in May or June and begin their nocturnal activities of flight, feeding, mating and egg-laying. Feeding activity is variable with some species feeding on the foliage of trees and shrubs while others do not feed at all. Female beetles lay eggs 2-3" below the soil surface. Grubs hatch from mid to late June and begin feeding on thatch and turfgrass roots. Feeding continues throughout the summer and into the fall prior to grub migration deeper into the soil where they overwinter in earthen cells. Grubs migrate up within the turfgrass root zone in April and May of the second season and feed on grass roots almost exclusively. It is during this period that turfgrasses can be subjected to extensive damage. The onset of cool fall weather send grubs deeper into the soil where, once again, they overwinter in earthen cells. Spring feeding activity during the third season is limited to approximately one month after which grubs burrow down to a depth of 60" to pupate. The pupae change to adult beetles during this season but remain in the soil all winter. Populations of June beetles may be synchronized in broods. The beetles

may all emerge mature in the same year. As a result, symptoms of turf damage would also be cyclic. However, should several broods of June beetles be present, it is possible to have several developmental stages of the beetles present at any one time.

Bluegrass Billbug

The bluegrass billbug, *Sphenophorus parvulus*, is a weevil that occasionally causes extensive damage to home lawns in Michigan. These beetles are named because of their long snout or "bill" which ends in a set of small mandibles or jaws. Migrating adult billbugs may be seen in May or August on sidewalks, driveways or patios.

Billbugs in the lawn are generally not detected until the first signs of damage appear in July. Damage caused by a high infestation of billbugs is similar to that caused by white grubs (beetle larvae). However, grub-damaged turf can be pulled up like a carpet to reveal white C-shaped larvae. Billbug damage is usually more localized and may first appear near curbs or driveways. Also, grub damage occurs in September and October, while billbug damage occurs in late July. Adult billbugs are dull gray to black beetles, 1/4- 1/2-inch long, with a snout or bill. Billbug larvae are white, legless, 5/8-inch long, humpbacked grubs with a yellow to brown head (Figure 2) which is harder in texture than the soft, white body.

Billbugs overwinter as adults and become active as temperatures begin to warm in April. Although some eggs are laid in grass stems in early May, most are deposited in early June. Egg hatch occurs in one to two weeks, and the larvae tunnel down through the grass stems into the crown and eventually settle in the roots. Mature larvae frequently feed on turfgrass roots and stems, often cutting the stems off at the crown so larvae are easily pulled up. Larvae may be present throughout the summer in small numbers. Peak density occurs in July. Adults that have overwintered may persist all summer but the new generation of adults (which will lay eggs the following spring) begin to emerge from small cells in the soil in early August. Soon after emerging, they seek out sheltered areas to spend the winter and can be observed on sidewalks, driveways and patios and near ground covers. There is only one generation per year.

Sod Webworm

Sod webworms, the caterpillar stage of lawn moths, are a pest of bluegrass lawns in Michigan. Several closely related webworm species have similar life cycles and damage symptoms. Most turfgrass species are susceptible to webworm damage, but bluegrass and bentgrass lawns appear to be especially vulnerable. Damage caused by sod webworms first appear as small brown patches of closely clipped grass. These patches may coalesce to form large irregular dead areas.

Nearly mature larvae (caterpillars) overwinter in the soil and resume feeding in the spring (late April-early May) as temperatures begin to rise. Occasionally, damage will occur in the spring from overwintered webworms. Adults begin to emerge in late May and early June and can be seen flying across lawns at dusk or just after dark. Adult moths rest during the day in deep grass, ground cover, or in shrubbery. Females may drop up to 200 eggs in the grass while they are flying.

Eggs hatch in 5 to 10 days and the young larvae begin feeding (skeletonizing) in the soft areas between the veins of grass blades. After a short time the larvae become large enough to consume small portions of the grass blade so that the damaged leaves may appear notched. Later, the more mature larvae construct silk-lined burrows in the thatch and begin to chew grass blades off just above the thatch line and pull them into their tunnels to consume. Injury thus appears as small circular (quarter size) areas of closely clipped grass and exposed brown thatch.

Pupation takes place in late June to early July and second generation adults are usually observed shortly afterward. New eggs are deposited and second generation larvae reach peak activity in mid- to late August. Most of the damage is caused by larvae of the second generation. As the temperatures drop in the fall, webworm larvae burrow deeper into the soil to overwinter. There are only two generations a year.