

White Grubs: A Common Turfgrass Insect

White grubs are the primary insect problem many homeowners face annually. Damage is usually noticed in late July to early August. However, last and this year damage has been noticed late in September and with the excess moisture fall feeding on turfgrass roots could extend into Fall. The earliest symptoms of white grub feeding on turfgrass roots is a gradual thinning and weakening of the stand. Damage may progress from sudden wilting of the grass, even with adequate moisture, to patches of dead grass. Small or large patches of dead or dying grass will have roots pruned so that sod can be pulled up or rolled back like a loose carpet. Numerous C-shaped whitish larvae with a brown head will lay in the upper soil directly below the dead sod. Mammals, such as skunks and armadillos, or birds digging for grubs can also cause additional turfgrass damage.

Adults are scarab beetles, May/June beetle, masked chafer, Japanese beetle, and green June beetle. These are the primary white grub species many homeowners face with the May/June beetle and masked chafers being the most common. Identification of white grub species can be made by: time of the year the grub is present, size of the grub and raster patterns on the abdomen of the grub (see diagrams).

May/June Beetles

Damage is typical wilting and small dead patches of sod. These beetles have a 3-year life cycle. Adult beetles can be damaging to trees and ornamentals. White grubs should be treated during late July to early August to control any newly hatched larvae. However, during the second year of the grub's life cycle, treatments can be made from April through September.

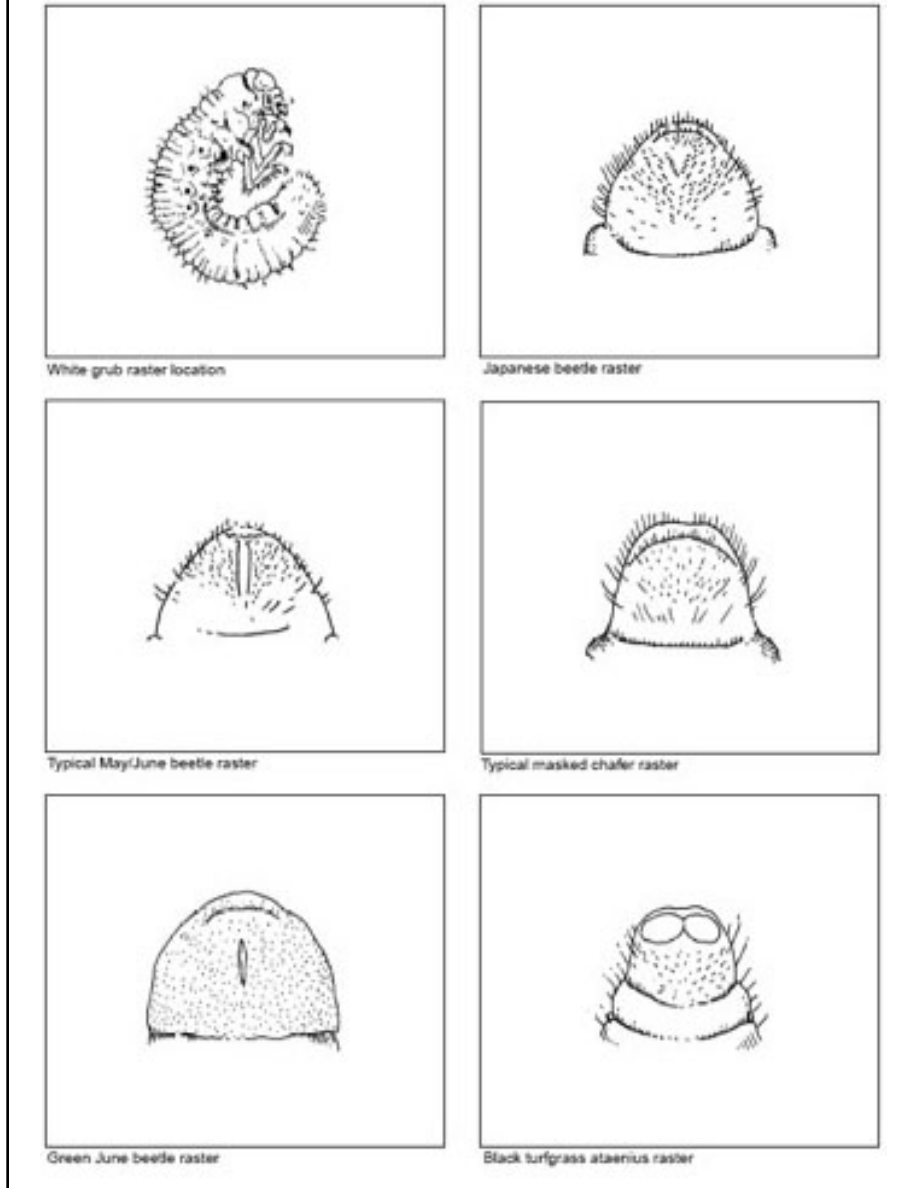
Masked Chafer

Turfgrass infested with this species exhibits the typical white grub damage. Wilting, irregular dead patches of turf are the symptoms. These beetles have a 1-year life cycle. Treat grubs about four weeks after the adult beetles start to emerge when egg deposits begin to hatch in late July to early August.

Japanese Beetles

These beetles are now considered to be state-wide in Missouri. Grubs feed on roots of turfgrasses and cause a wilting appearance and gradual thinning, however

Figure 1. Raster Patterns of White Grub Species



we generally do not see large amounts of turf damage specific to Japanese beetle grubs. Adult beetles can be damaging to about 400 host plants of both turf and ornamentals. Adult females will lay about 200 eggs per season, throughout the summer months. Therefore, we do not have a single egg laying time frame. Using a long-term residual product will work best to cover multiple egg laying episodes. Adult beetles can be treated at any time. If large numbers of adult beetles are noticed defoliating trees and shrubs, a preventative long-term residual product may be warranted.

Green June Beetles

Feeding activity of these grubs rarely causes severe turf damage. Rather, the damage to a lawn generally is mechanical in nature. The grubs burrow in and out of the turf, which produces mounds. These beetles are attracted to soils with high organic materials. The decaying organic matter in the soil is the primary food for this grub. This white grub is large, 1 ½ inches in length.

Control

The major factor influencing white grub density in turfgrass appears to be soil moisture; that is, in years with

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normal or above normal precipitation, grub populations tend to increase. This is because all white grub species require moist soil for their eggs to hatch. Young grubs are very susceptible to desiccation.

This dependence on soil moisture by white grubs can be exploited as a type of cultural control option. In areas where turf can stand some moisture stress, do not water as much in the hot summer months, particularly July and August when adults are laying eggs and young grubs are present.

In recent years, several strains of insect parasitic nematodes in the genera *Steinernema* and *Heterorhabditis* have offered somewhat effective biological control of white grubs. For these beneficial organisms to be most effective in managing white grub populations, it is critical that the labeled application instructions are followed exactly (e.g., time of day, soil moisture, size of grub, rates).

Because damaging white grub populations tend to be sporadic from year to year, preventative chemical control applications are not really justifiable. But in areas where moderate to damaging levels of grubs have been perennial, preventative applications made in late May or June may be warranted. Some products that seem to have extended activity are imidacloprid (e.g., Merit), and halofenozide (e.g., Mach 2).

Insecticides that have shorter residual periods (3 weeks or less) or must be ingested (preferably by small grubs) to be most effective are best used in a curative chemical control program. The successful use of these materials depends to a large degree on the proper timing of the applications (reapplication often necessary). These products must be applied shortly after egg hatch when the grubs are small and actively feeding. Remember, the smaller (younger) the grub, the easier it is to control. As a general rule, the recommended time to treat for grubs is about 4 weeks after the adult beetles start to emerge, the time when the eggs begin to hatch. For the Masked Chafer, this period is around late July to early August. Because emergence of May/June Beetle adults can last for several weeks, chemical treatment for May/June Beetle grubs is also recommended during late July to early August. Insecticides that appear to be effective as curative treatments include trichlorfon (e.g., Dylox), halofenozide (e.g., Mach 2), and carbaryl (e.g., Sevin).

Chemical applications can be rendered useless if the material has not been thoroughly watered-in (0.5-inch). The water not only moves the chemical down to the thatch layer (the final destination for most of the chemical), but it will often stimulate the grubs to move upward in the soil, closer to the thatch and toxicant. However, if the thatch layer is 0.75 inch to 1 inch thick, the grubs probably will not

come into contact with lethal doses of the insecticide. It may be necessary to remove some of the thatch before a chemical application.

To determine if a chemical treatment is necessary, a sampling of the grub population is necessary. To do this, cut a 1 square foot piece of sod in each of several areas of the lawn, pull it back, count the number of grubs, and inspect their rastral patterns to identify the species. Replace the sod squares back on the soil. If you have on average more than 10 Masked Chafer grubs or more than 5 May/June beetle grubs per square foot, then a chemical treatment is recommended. Remember, it is not unusual to have more than one species of white grub infesting the same lawn.

All chemical information is presented with the understanding that no endorsement of named products is intended, nor criticism implied of similar products that are not mentioned.

Before using any chemical please read the label carefully for directions on application procedures, appropriate rate, first aid, and storage and disposal. Make sure that the chemical is properly registered for the intended use.

*Brad S. Fresenburg
Extension/Research Associate
FresenburgB@missouri.edu
TrinkleinD@missouri.edu*