



White Grubs in Turf

Bayer Solutions

// THE PROBLEM

White grub species include northern and southern masked chafers (*Cyclocephala borealis*, *C. immaculata*, and/or *C. lurida*), Asiatic garden beetle (*Maladera castanea*), European chafer (*Rhizotrogus majalis*), May or June beetle (*Phyllophaga spp.*), Japanese beetle (*Popillia japonica*), Green June beetle (*Cotinis nitida*) and Oriental beetle (*Anomala orientalis*). Injury to turfgrass occurs from larval feeding on the roots, resulting in infested areas first turning yellow, then brown, and finally dying. When grub populations are heavy, areas of turf can be easily lifted from the soil. In addition, moles, raccoons, skunks, birds and other vertebrate animals that feed on white grubs, can cause severe damage as they forage for the insects in infested turf.

// WHAT TO LOOK FOR

Beetle adults differ in size, colour markings and life cycle, but their larval stages are often very similar in appearance. To identify grub larvae, use a 10X or 20X hand lens and examine the spines on the underside of the abdomen tip, called the raster. The raster pattern is different for each grub species and is the most common method of identification. In most cases, adult emergence occurs in mid-summer often after significant rainfall or irrigation, followed by mating and egg laying. The eggs hatch and the small larvae begin feeding on roots with molting from first to second instar occurring in a few weeks. Most of the visible feeding damage is caused by the large third instar larvae. Overwintering occurs in this third instar stage with larvae moving downward during late October or November into the soil profile for protection from cold weather.

The following spring, these larvae will move up to the soil-thatch interface to feed and replenish food reserves lost during the winter months before moving back down and transforming into the pupal stage. A one-year cycle will be completed with beetles emerging from this pupal stage a short time later. Monitor beetle activity by establishing black light or pheromone traps in areas that historically have had grub infestations. Japanese beetles may be monitored during the daylight hours using pheromone traps, while chafers and other species require black light monitoring at night. Check these traps at 2- or 3-day intervals, and record and graph collection numbers. Continue trapping until counts start to decline. Larval activity can be expected to occur four to six weeks after peak adult counts.

The larvae of several beetle species, commonly known as white grubs, are major pests of turfgrass throughout most of Canada. Integrated management programs that include the strategic use of insecticides should be utilized to control these damaging root feeders. Merit® is a broad-spectrum insecticide that is effective against problematic white grubs such as the black turfgrass ataenius, European chafer, and Japanese beetle. Insecticide performance can be affected by a number of factors including application timing and accuracy, amount of thatch, rainfall and/or irrigation following treatment, insect species, insect infestation level, and dosage. All of these factors must be considered when treating with Merit insecticide to ensure optimal insect control is achieved.

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Preventive Control

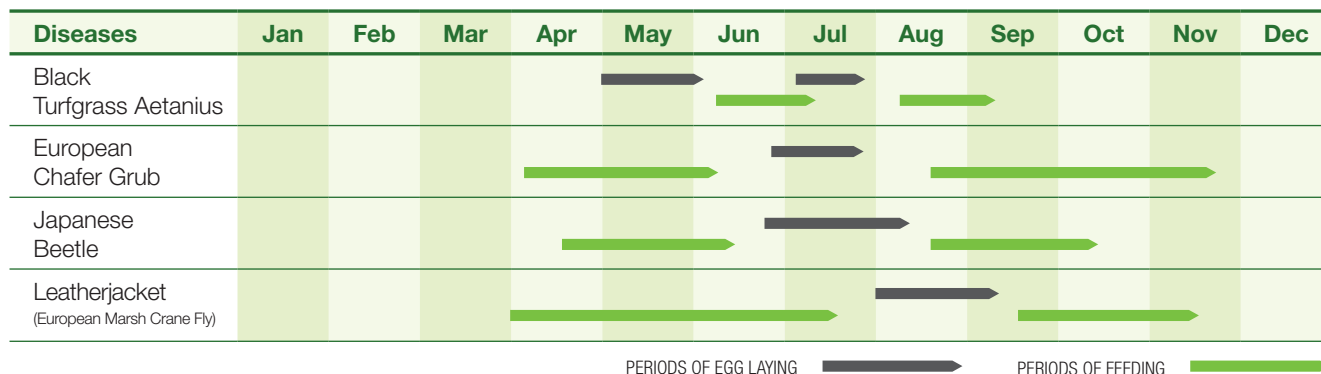
Imidacloprid, the active ingredient in Merit, interferes with nerve impulses and disrupts insect behavior, resulting in insects not feeding, not reproducing and eventually dying. Merit insecticide has sufficient residual activity, so applications can be made preceding the egg-laying activity of the adult stage. Merit insecticide should be applied prior to the onset of the third larval stage of white grubs, which in most areas will occur around mid-August. Optimum control is achieved when applications are made prior to egg hatch of the target pests, and when irrigation or rainfall (>13 mm) occurs within 24 hours after application to move the active ingredient through the thatch into the soil profile.



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TURFGRASS INSECT TIME PROFILE



Application Timing for Merit

- **May through June:** Black Turfgrass Aetanius
- **Mid June through mid-August:** European Chafer and Japanese Beetle
- **August to mid-September:** Leatherjacket suppression

RATES AND TIMING

Product	Application Rate	Water Volume	Post Irrigation Amount	Post Irrigation Amount
Merit Granular	0.56kg/100m ²	-	5-10mL	1-2 weeks of treatment
Merit Solupak	1 packet/1200m ²	8L/100m ²	5-10mL	As soon as possible within 12 hours



Stressed turf as a result of white grub activity.



Due to lack of root system, turf easily peels back to reveal white grubs.



Turf damage in area infested with white grubs due to foraging animals such as skunks and raccoons.

Photos: Dr. Rob Golembiewski, and Dr. Paul Giordano – Bayer.



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