GRUB MANAGEMENT

Dave Smitley
Entomology Department, M.S.U.
East Lansing, MI

It is not a good idea to treat all home lawns or all golf courses with an insecticide for grubs. A blanket application to all lawns or fairways may cause more problems than it solves because insecticides kill predators and suppress disease organisms that help keep grubs under control.

Instead of treating all lawns or fairways, target the most heavily infested ones for an insecticide. Home lawns or golf course roughs will benefit from watering just as much or more than they will from an insecticide treatment. The best way to manage grubs is with a scouting program. Scouting costs less than spraying, so it may save you money. Scouting for grubs can be broken down into three steps: sampling, identification and decision making.

Sampling: Lawns or golf courses can be sampled in May or August to September, but the fall option is preferred because fall is the best time to apply an insecticide if it is necessary. A cup-cutter can be used to take samples. It will pull-up a circular core of turf and soil that can be quickly sifted to look for grubs. Start with eight samples in each fairway or lawn. Eight samples can be taken and counted in 30 minutes. In a home lawn take four in the front yard and four in the back. For a lawn or fairway it is best to spread out the samples as much as possible to facilitate detection of hot spots. The grubs may only be in parts of fairways or lawns.

Identification: Grubs are the larval or immature stages of beetles. While inspecting a lawn you may find some of the adult beetles. You may also find some other kinds of beetles, including beneficial ones (predators). The most abundant type of beetle found on turf is the ground beetle (Figure 1). It is a black beetle with striated (lined with parallel grooves) wing covers. Different species of these beneficial beetles vary from 1/4 to 1/2 inch long. They can be distinguished from Ataenius beetles, a similar looking pest species, by their thread-like antennae. Ataenius beetles have very short, clubbed antennae. You may also find some bluegrass billbug adults. They are also a black beetle. However, billbugs are typical weevils, having a long, curved snout. Finally, you may see some Japanese beetles, European chafers, or June beetles. These are all robust, heavy-bodied beetles with spiny legs (Figure 1). European chafer and June beetles are light to dark brown in color, while Japanese beetles have a metallic green body and reddish-brown wing covers. Using the cup-cutter you will be looking for the larval stages of these beetles. There are two kinds of white grubs: weevil larvae and scarab larvae. The weevil larvae are white, maggot-like grubs with a brown head capsule and no legs (bluegrass billbug, Figure 1). The scarab larvae are C-shaped white grubs with legs. They vary from 1/4 to 1-inch long in late August, and by early October most of them will have grown to 3/4 to 1-inch long. The June beetle grubs may continue growing to a

length of 2 inches. These scarab grubs can be told apart by a pattern of spines on the underside of the last abdominal segment, called the raster (Figure 2).

Decision making: After a lawn or fairway has been sampled and the insects identified, a decision must be made about management. Will an insecticide be helpful or not? In order to make a good decision a threshold is needed. A threshold is an estimated cut-off point, above which an insecticide is recommended, and below which it is not. For Japanese beetle and European chafer, the two most troublesome pests of turf in Michigan, we can use the same thresholds. Because irrigated turf recovers from grub injury faster than water-stressed turf, we need two thresholds:

IRRIGATED TURF: 20 grubs per square foot
NON-IRRIGATED TURF: 5 grubs per square foot

For homeowners using a lawn sprinkler on a regular basis, a threshold of 10 grubs per square foot may be appropriate. When home lawns and fairways are sampled, few will have above 5 grubs per square foot, and very few will have more than 20 grubs per square foot. Daily irrigation is probably more effective than insecticide treatment for preventing damage by grubs. An insecticide treatment can only be expected to provide 50–75% reduction in the grub population. Liquid sprays must be irrigated immediately after application with 1/2 inch of water. Granular formulations are more stable, and can tolerate a few days of dry weather until it rains enough to wash the insecticide into the soil.

Following the scouting program; sampling, identification and decision making, is practicing integrated pest management (IPM). The IPM approach is the best approach, because you are preserving natural enemies that keep pest populations under control, and you are minimizing pesticide use – a key to protecting our environment.