

Management of Japanese beetle, European chafer, Ataenius and Aphodius grubs on golf courses

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Japanese beetle substantially increased its range around the Detroit area this year with many reports of beetles swarming in Macomb County and Lakeford township. Areas around Monroe, Battle Creek, Jackson and Kalamazoo continued to have problems with Japanese beetles. European chafer also expanded its range around Detroit and Grand Rapids. Turfgrass *Ataenius* grubs caused problems on some golf course fairways scattered across the entire state. About one in five golf courses have applied an insecticide for *Ataenius* grubs sometime in the last three years. In the last two years several *Aphodius* grub samples have been sent in from golf courses in Grand Rapids or west of Grand Rapids. The *Aphodius* grub is very similar in appearance to turfgrass *Ataenius* and probably has a similar life cycle: two generations per year. Therefore, for management purposes we can group *Ataenius* and *Aphodius* together like we do for Japanese beetle and European chafer.

Japanese beetle and European chafer

Superintendents usually discover Japanese beetle or European chafer grubs in September or May, peak time for grub feeding and the resulting turf injury. These are also peak feeding times for skunks and raccoons that tear up turf in search of the grubs. Many times skunk damage is observed first before the grubs are found. Irrigated turf has a tremendous ability to recover from insect injury. However, fairway turf with more than 20 grubs per square foot is very likely to have some brown patches due to grub injury. More than 7 grubs per square foot may cause injury to turf that is not irrigated. It is wise to check for grubs in fairway turf in late August. Dig several one square foot sections and count the number of grubs. If many grubs are found ($>20/\text{ft}^2$), late August and early September are the preferred times to apply an insecticide. All of the insecticides in Table 2 are effective against grubs. In general, Japanese beetle is easier to control than European chafer. The degree of control is highly variable from site to site and year to year. About the only consistent differences among insecticides have been that Triumph (tees and greens only) is usually one of the most effective treatments (80-99% control) and Sevin or Sevimol one of the least effective (50-80%). In European chafer tests, it is not unusual to see that the best treatment only provides 70% control.

Be sure to apply these products at the proper rate for grub control, which is usually higher than the rates for other turf insects. When applying Mocap be careful not to overlap granular application too much or you may see some turf yellowing. All the sprayable materials must be watered immediately after application with 1/2" of irrigation. Early morning or evening is the preferred application time for sprayables. Be sure your water pH is at a level compatible with the insecticide. Several products such as Dylox and Turcam break down rapidly in high pH water. If your irrigation water is at a high pH, choose products that are stable in your water pH range. Buffering the water in your spray tank will preserve the insecticide while it is in the tank but once it is applied to turf and irrigated heavily with high pH water it may break down unless the turf and soil buffer the irrigation water.

Three weeks after applying an insecticide return to where you took the original grub samples and collect another set of samples. This will tell you how effective the insecticide was.

Ataenius and Aphodius

The first indicator of a potential problem with Ataenius beetles is when large numbers of small (1/8 - 1/4" long) black beetles are observed on the greens in May. Nothing happens to the turf until early July when the grubs are nearly full grown. At that time some wilting or brown patches may be seen on tees, greens or fairways. When the turf is examined some 50 to 500 small (1/4") grubs may be found per square foot. Damage rarely occurs when less than 50 grubs per square foot are found. A second generation of beetles emerge in late July and more grub injury can occur in August. Because beetle emergence is spread out over several weeks, some Ataenius grubs may be found all summer. Ataenius damage appears to be more common on fairways with a high proportion of annual bluegrass. Golf courses where some Ataenius damage occurs every year may choose to apply Dursban in early to the middle of May when the beetles are emerging and laying eggs. This strategy is designed to kill the adults before they deposit eggs. However, because the population of Ataenius and Aphodius fluctuate from place to place and from year to year, I suggest waiting until early July and sampling fairways to determine if an insecticide is needed. If more than 50 grubs per square foot are found, one of the insecticides in Table 2 can be applied. Evaluate the grub population again two weeks later to see how effective the insecticide was. Control of Aphodius grubs will be the same with the exception that fairways should be examined about two weeks earlier, starting in the middle of June.

Milky Spore and Insect Parasitic Nematodes

Results of tests where milky spore has been applied for grub control have been consistently poor (0% control). I would not use the milky spore products until better field test data are obtained. The insect parasitic nematodes also performed poorly in grub control tests last year (0-50% control). However, better results were obtained for cutworm and webworm control. The label for the Biosafe and Biovector products states that the product can be used for cutworms and webworms but grubs are not mentioned. Insect parasitic nematodes may still be a good option for European chafer and June beetle grubs where insecticides are not very effective. If nematodes are applied, spray in early morning or evening. Water turf lightly before (1/4") and after application (1/4"). Do not apply nematodes to dry turf.

Table 2. Insecticides labeled for control of grubs in turf.

Insecticide	Amount per acre	Signal Word
*Triumph 4E	2.0 qt.	Warning
Oftanol 5G	40.0 lb.	Caution
Oftanol 2I	4.0 qt.	Warning
Proxol 80SP	10.2 lb.	Danger
Dylox 80SP	10.2 lb.	Danger
Mocap 5G	200.0 lb.	Warning
Turcam 76 WP	5.6 lb.	Warning
*Diazinon Ag500	6.0 qt.	Warning
*Diazinon 4E	5.5 qt.	Warning
Sevin 4SL	8.0 qt.	Caution
Sevin 80S	10.8 lb.	Caution

*Do not use Diazinon on golf courses or sod farms. Do not use Triumph on golf course fairways or sod farms. Triumph may be used on tees and greens in Michigan.