

# Turf Tips

## For Golf Course Superintendents

### Ataenius and Aphodius

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**Origin and distribution:** *Ataenius* (*Ataenius spre-tulus*) and *aphodius* (*Aphodius granarius*) are relative-ly new pests of golf course turf. Both *ataenius* and *aphodius* are members of the family Scarabaeidae and have the characteristic C-shaped white grub stage that damages turf. These insects rarely infest and damage home lawns. *Ataenius* is native to the United States, but *aphodius* was introduced from Europe. *Ataenius* was considered an accidental pest prior to the 1970s. Since then, it has become a seri-ous pest of golf course turf. *Aphodius* was considered an occasional pest of turfgrass and has often been mistaken for *ataenius*. In recent years, however, *aphodius* has been causing more problems on golf courses in Michigan.

**Hosts:** *Ataenius* and *aphodius* will feed on a vari-ety of cool-season turfgrasses— they do not seem to prefer any one type of grass. They do, however, pre-fer to feed on fairway turf. Damage from these small

white grubs is often seen on golf course fairways but rarely on the adjacent irrigated rough. Minimal damage is occasionally seen on greens, tees and aprons in Michigan.

**How to distinguish between *ataenius* and *aphodius*:** It is very difficult to distinguish between *ataenius* and *aphodius*. Both adult beetles are small, black and shiny and approximately 0.1 to 0.2 inch long (Fig. 1). The difference between the adult bee-tles is the stairstep appearance of the hind leg of *aphodius* (Fig. 2). The *ataenius* beetle's hind leg appears smooth compared with the hind leg of *aphodius*.

The larvae are also difficult to tell apart. Both are very small white grubs, less than 1/4 inch long (Fig. 3). To distinguish *ataenius* from *aphodius*, you must look at the pattern of hairs on the underside of the last segment of the grubs. The hairs of *aphodius*



Fig. 1. Adult *ataenius* beetle

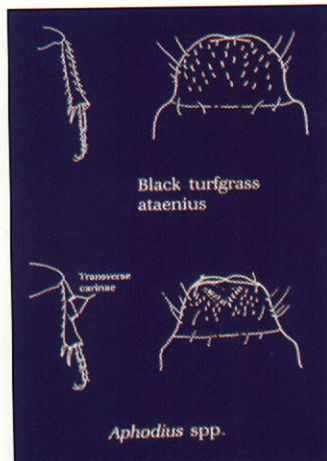


Fig. 2. Hind legs of *atae-nius* and *aphodius* adult beetles—raster patterns of *ataenius* and *aphodius* grubs



Fig. 3. *Ataenius* grub



resemble a V, while *ataenius* has no distinct pattern of hairs (Fig. 2). *Ataenius* grubs also have a pair of padlike structures on the tip of the last segment.

**Life history:** Both *ataenius* and *aphodius* have a one-year life cycle in Michigan. They overwinter as adults and begin to fly in the spring on warm days. Adult *aphodius* beetles begin to fly in late May. They lay eggs in the soil below the turf in May, the eggs hatch and the grubs immediately begin to feed on the turf roots. Peak grub damage from *aphodius* is seen in mid- to late June, depending on the year. *Ataenius* beetles begin to fly in June and also lay their eggs in the soil. *Ataenius* grub damage peaks in mid- to late July, again depending on the temperatures of the given year. *Ataenius* and *aphodius* life cycles rarely overlap, so timing can be an effective method of determining which type of grub you have (Fig. 4).

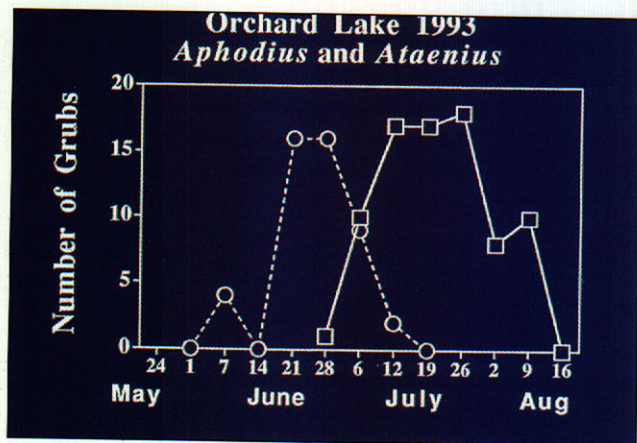


Fig. 4. *Ataenius* and *aphodius* life cycles

**How to diagnose *ataenius* and *aphodius* damage:**

The following signs can be used to diagnose *ataenius* and *aphodius* injury:

1) Turf appears wilted even in the presence of water. Wilted areas are especially visible when you view the turf facing toward the sun.

2) Turf begins to die in small patches, which eventually develop into large areas of dead turf. Grub damage can sometimes be difficult to distinguish from heat stress.

3) Peel the wilted or dead turf back to look for small white grubs in the thatch (area of dead and live shoots and roots below the turf surface) and in the soil as deep as 2 inches. Heavily infested turf can be rolled back like a carpet because most of the turf roots have been eaten by grubs.

**Natural controls:** Many natural control methods exist for *ataenius* and *aphodius*. Rove beetles, ground beetles, ants and histerid beetles are predators that are present on golf course turf. These insects are thought to prey on the grubs and the eggs of *ataenius* and *aphodius*. Milky spore disease (*Bacillus popilliae*) is a sporadic pathogen that affects white grubs while feeding. Milky spore bacteria build up inside grubs, turning them a milky white color and eventually killing them. Predators and pathogens are not always effective on golf course turf. Supplemental methods of chemical control may be needed during *ataenius* or *aphodius* outbreaks.

**Management:** Turf should be sampled before being chemically treated for *ataenius* and *aphodius* grubs. Because the grubs are small, the threshold level for *ataenius* and *aphodius* grubs is higher than that for other, larger white grub turf pests, such as Japanese beetle. The cup cutter method is effective for determining grub populations. If the turf is not under stress, it can tolerate up to 50 *ataenius* or *aphodius* grubs per square foot, or five per cup cutter. However, if stresses (drought, disease, other insect problems) are present in the turf system, the tolerance level will be lower. If the grub numbers are above these thresholds, control may be needed. Refer to the Extension bulletin "Commercial Turf Establishment and Pest Management" (E-2178) for insecticide recommendations.



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