



Aphodius and Ataenius Research

Julie Stachecki, David Smitley, and Paul Rieke
Crop and Soil Sciences

The Black Turfgrass Ataenius (*Ataenius spretulus*) and *Aphodius granarius* are golf course turfgrass pests found throughout lower Michigan. These two beetles look very much alike. They are both small black, tablet-shaped beetles, approximately 3-5 mm long. In the field, the distinguishing characteristic that allows us to identify which beetle is which, is the elevated ridge or "keel" found on the tibia of the hind leg of the Aphodius. Over the last two growing seasons we have learned that Aphodius and Ataenius beetles exist in the same areas, and their life cycles overlap by a few weeks. The aphodius grubs are in the soil feeding approximately three weeks earlier than ataenius grubs. But, before the aphodius pupate (transformation into an adult beetle) we begin to find ataenius grubs in the same locations. Peak feeding damage for aphodius is usually in late June while ataenius grubs reach peak activity in late July.

These beetles overwinter as adults, emerge from overwintering sites in the spring and immediately seek places to lay eggs, golf course turfgrass in particular. Eggs hatch into small white grubs which mature through three instars, pupate, and emerge as adults. In Michigan, it is believed that aphodius has one complete generation and ataenius has one or possibly two depending on seasonal conditions. There was only one generation of each of these beetles in 1992 and 1993 in the Detroit area.

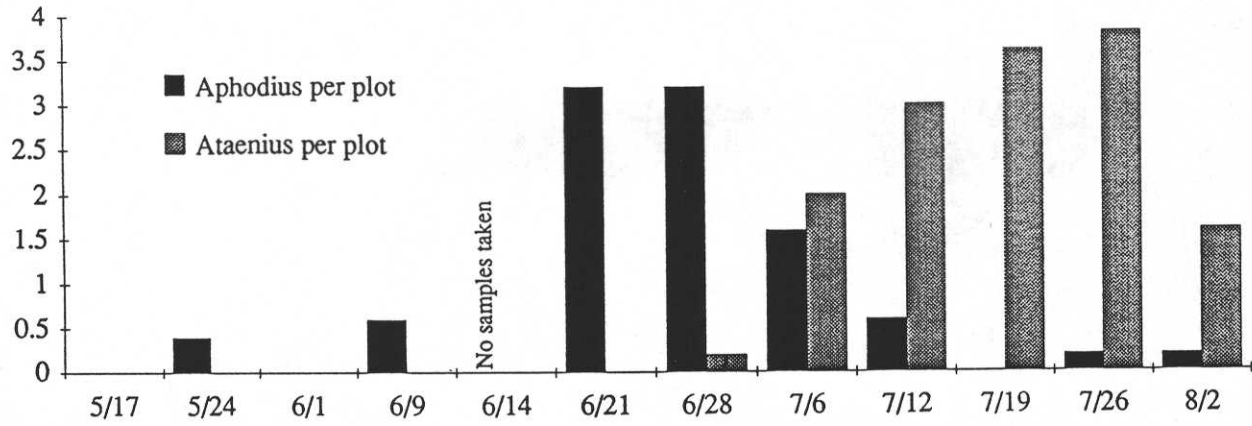
As grubs, ataenius and aphodius feed on the roots of turf. Damage is usually seen when turf becomes water stressed. It appears that irrigated turf can withstand up to 40-50 grubs per square foot before aphodius injury becomes apparent. We will be comparing this threshold with ataenius feeding habits as this season progresses.

Weather data has been monitored throughout 1992 and 1993. Degree day information will be calculated and correlated with the various development stages of these two beetles. Having a degree day model for these insects' life cycles will provide turf managers a reliable tool for predicting emergence, adult activity, grub feeding and thus an awareness of when these insects are active and may need control. If grubs are detected and a control measure is necessary, more accurate timing of applications will lead to more effective control. Phenological indicator plants (tree and shrub flowering times) will also be identified as a reminder of the beetles' life stage and activity.

We collected all the ataenius and aphodius grubs found in our research plots this year for microscopic examination. So far, we have dissected most of the aphodius grubs collected in early June. More than half of the grubs were infected with the milky spore bacterial pathogen, *Bacillus popillae*. Over the next three months we will dissect all the grubs

collected this summer. The naturally occurring milky spore bacteria that infect aphodius and ataenius may be important natural enemies that help regulate populations of grubs. *Bacillus popillae* is known to be sensitive to some pesticides. Minimizing the use of insecticides and fungicides on golf course fairways may help preserve milky spore bacteria that infect grubs.

Aphodius and Ataenius Grubs at Orchard Lake Country Club 1993



Aphodius Grubs at Oakland Hills Country Club 1993

