

Thresholds Pinpoint Insecticide Timing

By Pat Vittum

There are two important factors in determining how to control grubs on your turf. The first is accurately identifying which grubs are attacking. The second component of a good grub-control program is to figure out how many grubs are actually present in your turf.

Grubs can be identified to species by inspecting the shape of the anal slit and the pattern of hairs on its posterior. With new environmental restrictions appearing each day, superintendents no longer have the freedom to treat grubs with impunity. Therefore, superintendents should figure out what the threshold is that grubs must cross before they cause serious damage to the turf.

Action thresholds are a way of quantifying how many grubs your turf can tolerate. In general, turf that is already under some agronomic stress will be less able to tolerate grub activity. Stress factors include mowing height, fertility, soil pH and condition, fertility, moisture and temperature. In this article, we will discuss different white grub species and action thresholds for each. The action thresholds mentioned here are intended as guidelines only and can serve as a way of comparing damage potential between species. A higher threshold indicates that each individual grub causes less damage than a species with a lower threshold.

Japanese beetles

Japanese beetles have a transverse anal slit (it follows the contour of the grub), and a v-shaped row of spines just in front of the slit, pointing toward the head.

These beetles can be found virtually anywhere east of the Mississippi River and north of central Georgia. They also are beginning to show up in parts of Minnesota and some of the central Plains (including Kansas). They have even shown up in California a couple times, but authorities acted quickly and eradicated the outbreaks.

They are the most widely distributed (and

the most commonly encountered) grub species in North American turfgrasses. Fortunately, they are more susceptible to chemical control than most of the other species. Action thresholds typically range from six to 15 grubs per square foot in moderately maintained turfgrass.

European chafers

European chafers have a branched anal slit and two almost parallel rows of spines that look like an opening zipper. These chafers are active in the eastern third of Massachusetts (within 30 miles of Boston), Rhode Island and along the Erie Canal in New York, as well as southern New Hampshire and southern Maine.

There are several other areas of infestation along the shores of the Great Lakes, including east of Cleveland and parts of

Overall, white grubs are more widespread and impact a wider range of turf settings than any other insect, particularly in cool-season turf.

southern Michigan. Action thresholds usually are slightly lower than those for Japanese beetles, at five to 10 grubs per square foot.

Oriental beetles

Oriental beetles have a transverse anal slit (like the Japanese beetle) and two almost parallel rows of spines. They are found in coastal New England (including most of Rhode Island and Connecticut), Long Island, N.Y., eastern New Jersey and parts of Pennsylvania.

Beetles are also found in most towns along the Connecticut River in Connecticut and Massachusetts, and perhaps even into southern Vermont and New Hampshire. In addition, populations have been



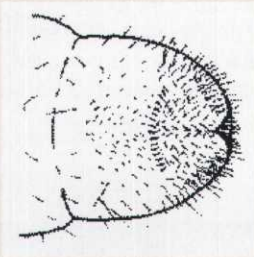
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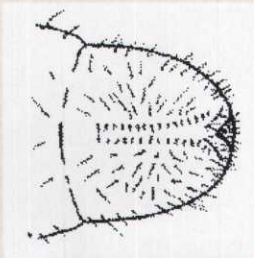
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FIGURE 1

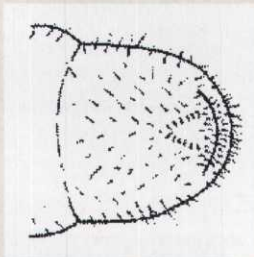
The raster patterns for common turfgrass grubs:



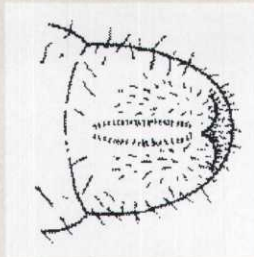
Asiatic Garden Beetles: Action thresholds are higher than for Japanese beetles, at 10 to 20 grubs per square foot because they're significantly smaller.



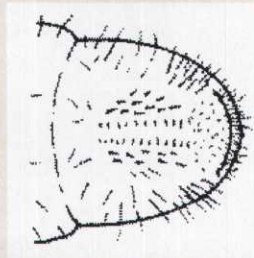
Europe Chafers: Action thresholds usually are slightly lower than those for Japanese beetles, at five to 10 grubs per square foot.



Japanese Beetles: Action thresholds typically range from six to 15 grubs per square foot in moderately maintained turfgrass.



Green June Beetles: Action thresholds are usually a bit higher than for the direct root-feeding species, like the Japanese beetle.



Oriental Beetles: Action thresholds typically range from six to 15 grubs per square foot in moderately maintained turfgrass.

reported in nursery areas east of Cleveland and in western North Carolina.

Scientists have developed a pheromone which they are using to determine the current distribution of oriental beetles. My guess is the more we look, the more we will find them. Action thresholds are about the same as for Japanese beetles.

Asiatic garden beetles

Asiatic garden beetles have a branched anal slit and a distinct semicircle of spines just in front of the slit. The beetles are active throughout the Northeast and Midwest, and adults are often found in the soil in home gardens. There is evidence that their activity is increasing in several locations.

In many cases, these locations are places where imidacloprid had been used repeatedly, but we do not yet have irrefutable proof that the chemical is forcing a species shift. These grubs are markedly smaller than Japanese beetle grubs, so action thresholds are higher, at 10 to 20 grubs per square foot.

Northern and Southern masked chafers

Northern- and Southern-masked chafers have a transverse anal slit, while the spines are scattered with no obvious pattern. These chafers occur throughout the Northeast and Midwest, but are much more common in the Midwest and Plains States (Indiana, Illinois, Nebraska and Kentucky).

While these insects are slightly larger than Japanese beetles, they are more likely to feed on organic matter in the thatch and cause less direct damage to turf roots. Therefore, action thresholds tend to be slightly higher than for Japanese beetles at 8 to 20 grubs per square foot, depending on agronomic conditions.

Not all beetles emerge at the same time. The earliest ones may begin laying eggs in early to mid July, while others may not begin to oviposit until sometime in August.

Green June beetles

Green June beetles have a transverse anal slit and two fairly compact parallel rows of spines. These grubs have short legs that are not used for locomotion. Each grub has several ridges on its back with short, stiff hairs used to grip the substrate.

These beetles are widely distributed in the eastern United States, from southeastern New York to Florida and westward to Texas and Kansas. Because the grubs

feed more in the thatch and not as much on the roots, thresholds are usually a bit higher than for the direct root-feeding species like the Japanese beetle.

Vittum is a professor of entomology at the University of Massachusetts. She is primarily an extension entomologist and teaches turf entomology every spring, as well as a course in "Pesticides in the Environment" every fall. She is the senior author of "Turfgrass Insects of the United States" (Cornell University Press).

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