TURF PEST INSECTS AND CHEMICAL CONTROLS *(CONTINUED)*

WHITE GRUBS

Japanese beetle, masked chafers, European chafers, Asiatic garden beetle, oriental beetle

Bacillus popilliae Japanese beetle only	biological	see label
Beauveria bassiana JW-1	biological	see label
Bifenthrin[e]	pyrethroid	0.1 (adults only)
Carbaryl	carbamate	8.0
Chlorpyrifos[b]	organophosphate	2.0-4.0
Cyfluthrin[e]	pyrethroid	0.2 (JP adults only)
Deltamethrin[e]	pyrethroid	0.08-0.13 (JP adults only)
Diazinon[a]	organophosphate	4.0-5.5
Halofenozide	grown regulator	1.5-2.0
Heterorhabiditis bacteriophora	biological	see label
Imidaclorid	chloronicotinyl	0.3-0.4
Lambda-cyhalothrin[e]	pyrethroid	0.055 (suppression)
Permethrin[c]	pyrethroid	0.44-0.87
Steinernema glaseri	biological	see label
Trichlorfon		8.0

MAY/JUNE BEETLES, PHYLLOPHAGA SPP

Carbaryl	carbamate	8.0
Halofenozide	growth regulator	1.5
Imidaclorid	chloronicotinyl	0.3
Trichlorfon	organophosphate	8.0

BLACK TURFGRASS ATAENIUS

Acephate	organophosphate	3.0-4.0
Beauveria bassiana JW-1	biological	see label
Beta-cyfluthrin[c]	pyrethroid	0.07 (adults)
Bifenthrin[e]	pyrethroid	0.05-0.1 (adults)
Chlorpyrifos[b]	organophosphate	2.0-4.0
Halofenozide	growth regulator	1.5
Imidacloprid	chloronicotinyl	0.3-0.4
Lambda-cyhalothrin[e]	pyrethroid	0.055 (adults)
Spinosad	spinosad	0.4 (adults)
Trichlorfon	organophosphate	8.0

GREEN JUNE BEETLE

Beauveria bassiana JW-1	biological	see label
Carbaryl	carbamate	2.0-4.0
Halofenozide	growth regulator	1.5
Trichlorfon	organophosphate	8.0

[a] Not registered for use on golf courses or sod farms.

[b] Not to be used on residential turf.

[c] For home lawns only.

[d] Actual formulation

[e] Different trade names exist for golf course, sod farms and other turf areas

SOURCE: "2002 MANAGEMENT OF TURFGRASS PESTS," OHIO STATE UNIVERSITY EXTENSION

Grub identification tips

BY PAT VITTUM, PH.D.

Two factors in determining how to control grubs in your turf are: 1. identifying which grubs are attacking your turfgrass, and 2. figuring out how many there are.

To identify grub species, inspect the shape of the anal slit and the pattern of hairs on its posterior. Use a hand lens; it makes the job a lot easier. Next, figure out what the threshold is that grubs must cross before they seriously damage the turf.

The following are some identifying characteristics of each grub species and action thresholds for each. Use this information strictly as a guide. It serves as a way to compare damage potential between species.

Japanese beetles

Identifier: Transverse anal slit and a v-shaped row of spines just in front of the slit, pointing toward the head.

Range: Found east of the Mississippi River and north of central Georgia. They're also beginning to show up in parts of Minnesota and some of the Central Plains.

Action threshold: Six to 15 grubs per sq. ft. in moderately maintained turfgrass.

European chafers

Identifier: Branched anal slit and two almost parallel rows of spines that look like an opening zipper.

Range: Eastern third of Massachusetts, Rhode Island and along the Erie Canal in New York, southern New Hampshire and southern Maine. Other areas of infestation include the shores of the Great Lakes and parts of southern Michigan.

Action threshold: five to 10 grubs per sq. ft.

Oriental beetles

Identifier: A transverse anal slit (like the Japanese beetle) and two almost parallel rows of spines

Range: Coastal New England (including most of Rhode Island and Connecticut), Long Island, eastern New Jersey and parts of Pennsylvania, with populations also reported along the Connecticut River and perhaps into southern Vermont and New Hampshire. Other locations will probably be confirmed through pheromone trapping.

Action threshold: Six to 15 grubs per sq. ft.

Asiatic garden beetles

Identifier: Branched anal slit with a distinct semicircle of spines just in front of the slit.

Range: Throughout the Northeast and Midwest.

Action threshold: 10 to 20 grubs per sq. ft.

Northern and southern masked chafers

Identifier: Transverse anal slit. Spines are scattered with no obvious pattern.

Range: Throughout the Northeast and Midwest but are more common in the Midwest and Plains states.

Action threshold: Eight to 20 grubs per sq. ft.

Green June beetles

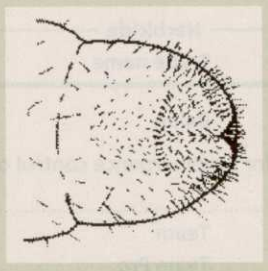
Identifier: Transverse anal slit and two fairly compact parallel rows of spines. These grubs have short legs that aren't used for locomotion.

Range: Eastern U.S., from southeastern New York to Florida and westward to Texas and Kansas.

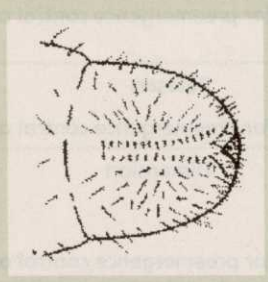
Action threshold: Because the grubs feed more in the thatch and not as much on the roots, thresholds are usually higher than for the direct root-feeding species like the Japanese beetle.

— From the November 2002 issue of Turfgrass Trends. Visit **www.turfgrasstrends.com**

The raster patterns for common turfgrass grubs:

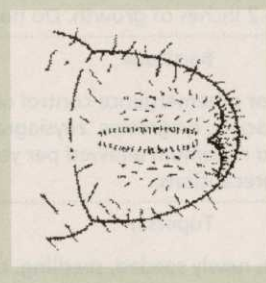


Asiatic garden beetles: Action thresholds are higher than for Japanese beetles (at 10 to 20 grubs per square foot) because they're significantly smaller.

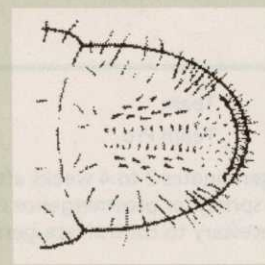


Europe chafers: Action thresholds usually are slightly lower than those for Japanese beetles, at five to 10 grubs per square foot.

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.