Pest control information and recommendations for turfgrass

These recommendations have been compiled from several sources that were updated this past year, including cooperative extension publications from Cornell, The Ohio State and North Carolina State Universities. Our thanks to the Green Industry programs at these fine universities. Even so, they are still recommendations and may not apply to your area because of state and local regulations. While they indicate active ingredients that have been proven to be effective against particular pests — when used according to label directions and under proper conditions — make sure there are no restrictions on their use in your market. When in doubt, check with Cooperative Extension or with the turfgrass and ornamental experts at your state land grant university.

Always read and follow label directions. When in doubt about a label’s intent or the proper or most effective way to use a particular product, contact the manufacturer (use the toll-free number on the label) or visit the manufacturer’s Web site.

TURF PEST INSECTS AND CHEMICAL CONTROLS

■ ARMYWORMS
Treat at first sign of damage. Use a soap flush to disclose populations.

<table>
<thead>
<tr>
<th>Insecticidal treatment</th>
<th>Chemical class</th>
<th>Lbs. ai/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azadirachtin</td>
<td>biological</td>
<td>0.02-0.43</td>
</tr>
<tr>
<td>Beauveria bassiana JW-1</td>
<td>biological</td>
<td>0.67-1.67 qt/acre</td>
</tr>
<tr>
<td>Beta-cyfluthrin</td>
<td>pyrethroid</td>
<td>0.046-0.07</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>pyrethroid</td>
<td>0.05</td>
</tr>
<tr>
<td>Carbaryl</td>
<td>carbamate</td>
<td>2.0-4.0</td>
</tr>
<tr>
<td>Chlorpyrifos</td>
<td>organophosphate</td>
<td>1.0</td>
</tr>
<tr>
<td>Cyfluthrin</td>
<td>pyrethroid</td>
<td>0.1-0.2</td>
</tr>
<tr>
<td>Deltamethrin</td>
<td>pyrethroid</td>
<td>0.08-0.13</td>
</tr>
<tr>
<td>Diazinon</td>
<td>organophosphate</td>
<td>2.7-5.5</td>
</tr>
<tr>
<td>Halofenozide</td>
<td>growth regulator</td>
<td>1.0</td>
</tr>
<tr>
<td>Heterorhabditis bacteriophora</td>
<td>biological (0.6-1.0 bill./acre)</td>
<td></td>
</tr>
<tr>
<td>Lambda-cyhalothrin</td>
<td>pyrethroid</td>
<td>0.027-0.055</td>
</tr>
<tr>
<td>Permethrin</td>
<td>pyrethroid</td>
<td>0.44-0.87</td>
</tr>
<tr>
<td>Spinosad</td>
<td>spinosyn</td>
<td>0.07 (small larvae), 0.4 (large larvae)</td>
</tr>
<tr>
<td>Steinernema carpocapsae</td>
<td>biological</td>
<td>(1.0 bill./acre)</td>
</tr>
</tbody>
</table>

■ BERMUDAGRASS MITE
Found in southern states

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Chemical class</th>
<th>Lbs. ai/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beauveria bassiana JW-1</td>
<td>biological</td>
<td>see label</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>pyrethroid</td>
<td>0.05-0.1</td>
</tr>
<tr>
<td>Carbaryl</td>
<td>carbamate</td>
<td>2.0-4.0</td>
</tr>
<tr>
<td>Chlorpyrifos</td>
<td>organophosphate</td>
<td>1.0</td>
</tr>
<tr>
<td>Cyfluthrin</td>
<td>pyrethroid</td>
<td>0.1-0.2</td>
</tr>
<tr>
<td>Deltamethrin</td>
<td>pyrethroid</td>
<td>0.08-0.13</td>
</tr>
<tr>
<td>Diazinon</td>
<td>organophosphate</td>
<td>2.7-4.0</td>
</tr>
<tr>
<td>Imidacloprid</td>
<td>chloronicotinyl</td>
<td>0.4 (suppression only)</td>
</tr>
<tr>
<td>Heterorhabditis bacteriophora</td>
<td>biological</td>
<td>see label</td>
</tr>
</tbody>
</table>

■ BLUEGRASS BILLBUG LARVAE
Control larvae in late spring. Thatch reduction and good irrigation improve efficacy of products.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Chemical class</th>
<th>Lbs. ai/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beauveria bassiana JW-1</td>
<td>biological</td>
<td>see label</td>
</tr>
<tr>
<td>Carbaryl</td>
<td>carbamate</td>
<td>2.0-4.0</td>
</tr>
<tr>
<td>Diazinon</td>
<td>organophosphate</td>
<td>2.7-5.5</td>
</tr>
<tr>
<td>Halofenozide</td>
<td>growth regulator</td>
<td>1.0</td>
</tr>
<tr>
<td>Heterorhabditis bacteriophora</td>
<td>biological</td>
<td>see label</td>
</tr>
<tr>
<td>Lambda-cyhalothrin</td>
<td>pyrethroid</td>
<td>0.027-0.055</td>
</tr>
<tr>
<td>Permethrin</td>
<td>pyrethroid</td>
<td>0.44-0.87</td>
</tr>
<tr>
<td>Steinernema carpocapsae</td>
<td>biological</td>
<td>see label</td>
</tr>
</tbody>
</table>

■ CHINCH BUGS
Control adults when first noticed migrating in spring. Use pitfall traps to monitor adults of observe on warm, sunny days. Adults lay eggs in turf stems as soon as they become active.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Chemical class</th>
<th>Lbs. ai/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beauveria bassiana JW-1</td>
<td>biological</td>
<td>see label</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>pyrethroid</td>
<td>0.05-0.1</td>
</tr>
<tr>
<td>Carbaryl</td>
<td>carbamate</td>
<td>2.0-4.0</td>
</tr>
<tr>
<td>Chlorpyrifos</td>
<td>organophosphate</td>
<td>1.0</td>
</tr>
<tr>
<td>Cyfluthrin</td>
<td>pyrethroid</td>
<td>0.1-0.2</td>
</tr>
<tr>
<td>Deltamethrin</td>
<td>pyrethroid</td>
<td>0.08-0.13</td>
</tr>
<tr>
<td>Diazinon</td>
<td>organophosphate</td>
<td>2.7-4.0</td>
</tr>
<tr>
<td>Imidacloprid</td>
<td>chloronicotinyl</td>
<td>0.4 (suppression only)</td>
</tr>
<tr>
<td>Heterorhabditis bacteriophora</td>
<td>biological</td>
<td>see label</td>
</tr>
<tr>
<td>Lambda-cyhalothrin</td>
<td>pyrethroid</td>
<td>0.027-0.055</td>
</tr>
<tr>
<td>Permethrin</td>
<td>pyrethroid</td>
<td>0.44-0.87</td>
</tr>
<tr>
<td>Steinernema carpocapsae</td>
<td>biological</td>
<td>see label</td>
</tr>
</tbody>
</table>
## CLOVER MITE

<table>
<thead>
<tr>
<th>Insecticidal treatment</th>
<th>Chemical class</th>
<th>Lbs. ai/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bifenthrin&lt;sup&gt;e&lt;/sup&gt;</td>
<td>pyrethroid</td>
<td>0.05</td>
</tr>
<tr>
<td>Chlorpyrifos&lt;sup&gt;b&lt;/sup&gt;</td>
<td>organophosphate</td>
<td>1.0</td>
</tr>
<tr>
<td>Deltamethrin&lt;sup&gt;e&lt;/sup&gt;</td>
<td>pyrethroid</td>
<td>0.08-0.13</td>
</tr>
<tr>
<td>Diazinon&lt;sup&gt;a&lt;/sup&gt;</td>
<td>organophosphate</td>
<td>2.7-5.5</td>
</tr>
<tr>
<td>Dicofol</td>
<td>organochlorine</td>
<td>0.46-0.92</td>
</tr>
<tr>
<td>Lambda-cyhalothrin&lt;sup&gt;e&lt;/sup&gt;</td>
<td>pyrethroid</td>
<td>0.027-0.055</td>
</tr>
</tbody>
</table>

## GREENBUG

**Aphids**

- Acephate, organophosphate 1.0
- Chlorpyrifos<sup>b</sup>, organophosphate 1.0

## MOLE CRICKETS

Imported mole crickets are pests of southern turf.

- Acephate, organophosphate 2.0-4.0
- *Beauveria bassiana* JW-1, biological see label
- Beta-cyfluthrin<sup>c</sup>, pyrethroid 0.046-0.07
- Bifenthrin<sup>e</sup>, pyrethroid 0.05
- Carbaryl, carbamate 2.0-4.0
- Chlorpyrifos<sup>b</sup>, organophosphate 1.0
- Cyfluthrin<sup>e</sup>, pyrethroid 0.1-0.2
- Deltamethrin<sup>e</sup>, pyrethroid 0.08-0.13
- Diazinon<sup>a</sup>, organophosphate 2.7-5.5
- Fipronil, phenyl pyrazole 0.0125-0.025 (golf course and commercial grounds only)
- Imidocloprid, chloronicotinyl 0.4
- Lambda-cyhalothrin<sup>e</sup>, pyrethroid 0.027-0.055
- Permethrine, pyrethroid 0.44-0.87
- *Steinernema riobravis*, biological see label
- *Steinernema scapterisci*, biological see label

## GENERAL CRANE FLY LARVAE

- Bifenthrin<sup>e</sup>, pyrethroid 0.05-0.1

## CUTWORMS

- Acephate, organophosphate 2.4-5.0
- Azadirachtin, biological see label
- Beta-cyfluthrin<sup>c</sup>, pyrethroid 0.046-0.07
- Bifenthrin<sup>e</sup>, pyrethroid 0.05
- Carbaryl, carbamate 2.0-4.0
- Chlorpyrifos<sup>b</sup>, organophosphate 1.0
- Cyfluthrin<sup>e</sup>, pyrethroid 0.1-0.2
- Deltamethrin<sup>e</sup>, pyrethroid 0.08-0.13
- Diazinon<sup>a</sup>, organophosphate 2.7-5.5
- Halofenozide, growth regulator 1.0
- *Heterorhabditis bacteriophora*, biological see label
- Imidacloprid, chloronicotinyl 0.3-0.4 (suppression only)
- Lambda-cyhalothrin<sup>e</sup>, pyrethroid 0.027-0.055
- Spinosad, spinosad 0.24 (small larvae), 0.4 (large larvae)
- *Steinernema carpocapsae*, biological see label
- Trichlorfon, organophosphate 5.4-8.0

## FALL ARMYWORM

- Acephate, organophosphate 1.0-2.4
- Azadirachtin, biological 0.02-0.43
- Bifenthrin<sup>e</sup>, pyrethroid 0.05
- Carbaryl, carbamate 2.0-4.0
- Chlorpyrifos<sup>b</sup>, organophosphate 1.0
- Halofenozide, growth regulator 1.0
- Lambda-cyhalothrin<sup>e</sup>, pyrethroid 0.027-0.055
- Spinosad, spinosad 0.07 (small larvae), 0.4 (large larvae)

## SOD WEBWORMS

- Acephate, organophosphate 2.4-5.0
- Azadirachtin, biological 0.02-0.43
- *Bacillus thuringiensis kurstaki*, biological see label
- *Beauveria bassiana* JW-1, biological see label
- Beta-cyfluthrin<sup>c</sup>, pyrethroid 0.046-0.07
- Bifenthrin<sup>e</sup>, pyrethroid 0.05
- Carbaryl, carbamate 2.0-4.0
- Chlorpyrifos<sup>b</sup>, organophosphate 1.0
- Cyfluthrin<sup>e</sup>, pyrethroid 0.1-0.2
- Deltamethrin<sup>e</sup>, pyrethroid 0.08-0.13
- Diazinon<sup>a</sup>, organophosphate 2.7-5.5
- Fluvinate, pyrethroid 0.05-0.16
- Halofenozide, growth regulator 1.0
- *Heterorhabditis bacteriophora*, biological see label
- Lambda-cyhalothrin<sup>e</sup>, pyrethroid 0.027-0.055
- Permethrine<sup>c</sup>, pyrethroid 0.44-0.87
- Spinosad, spinosad 0.24 (small larvae), 0.4 (large larvae)
- *Steinernema carpocapsae*, biological see label
- Trichlorfon, organophosphate 5.4-8.0
Insect Control / LM’s Quick Reference Guide

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  
  Pyrethroid  
  0.1 (adults only)

- Carbaryl  
  Carbamate  
  8.0

- Chlorpyrifos  
  Organophosphate  
  2.0-4.0

- Cyfluthrin  
  Pyrethroid  
  0.2 (JP adults only)

- Deltamethrin  
  Pyrethroid  
  0.08-0.13 (JP adults only)

- Diazinon  
  Organophosphate  
  4.0-5.5

- Halofenozide  
  Growth regulator  
  1.5-2.0

- Heterorhabditis bacteriophora  
  Biological  
  See label

- Imidacloprid  
  Chloronicotinyl  
  0.3-0.4

- Lambda-cyhalothrin  
  Pyrethroid  
  0.055 (suppression)

- Permethrin  
  Pyrethroid  
  0.44-0.87

- Steinernema glaseri  
  Biological  
  See label

- Trichlorfon  
  8.0

**BLACK TURFGRASS ATAENIUS**

- Acephate  
  Organophosphate  
  3.0-4.0

- Beauveria bassiana JW-1  
  Biological  
  See label

- Beta-cyfluthrin  
  Pyrethroid  
  0.07 (adults)

- Bifenthrin  
  Pyrethroid  
  0.05-0.1 (adults)

- Chlorpyrifos  
  Organophosphate  
  2.0-4.0

- Halofenozide  
  Growth regulator  
  1.5

- Imidacloprid  
  Chloronicotinyl  
  0.3-0.4

- Lambda-cyhalothrin  
  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

---

**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.

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