

## Cool-season turf's

# Public

# enemies

*Don't rely on "spray and pray" to bump off this gang of notorious turfgrass killers*

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**O**f the many problem insects in cool-season turfgrass, two are particularly destructive — white grubs and billbugs. White grubs feed on roots and root hairs in the soil and occasionally forage in the lower parts of the thatch. Billbug larvae feed inside stems and later migrate to the crowns, which they often sever outright. Affected plants can be tugged out of the ground with little or no resistance. Both are a challenge to manage, but for different reasons.

### 'Most wanted' grubs

White grub species have similar life cycles, but crucial differences. Each responds a little differently to turf insecticides:

► The *Japanese beetle* is the most widely distributed white grub in the eastern United States, preferring sandy or loamy soils and thriving in well maintained (i.e., irrigated) turf. It is easy to manage because it's relatively vulnerable to most turf insecticides.

► The *European chafer* is a problem in

upstate New York, the coasts of Lakes Ontario and Erie, eastern Massachusetts and parts of Michigan. It thrives in poorly maintained turf like unirrigated lawns and golf course roughs. Its life cycle occurs two or three weeks earlier than the Japanese beetle in a given location, and it is less sensitive to cold (these grubs stay in the root-zone late in autumn and return to the roots earlier in spring than do other species).

This means more widespread and severe damage than with other species. And the European chafer is much less vulnerable to insecticides than most other grub species, so time your application carefully. For example, if the adults have already laid most of their eggs, these insecticides may not work very well and you may have to switch to a faster-acting product.

► The *oriental beetle* is a major pest throughout the Northeast and is closely related to the Japanese beetle, but has some striking differences. The life cycle usually is about one or two weeks ahead of the Japanese beetle, and the grubs may move into the soil profile more readily when conditions get hot or dry — and return with a vengeance when conditions improve in fall.

Oriental beetles are much less susceptible to many turf insecticides than are

Japanese beetles and must be treated more precisely — give more care to timing applications based on the characteristics of the insecticide. You may need a followup treatment.

► *Asiatic garden beetles* are slowly becoming more common throughout the Northeast and appear to be less sensitive to many turf insecticides, so treatment of other grub species opens up opportunities for these tiny grubs to move in and get established. So far they have been little more than a nuisance, but that could change!

► *Northern* and *southern masked chafers* are grubs native to the United States, with a life cycle similar to the Japanese beetle. They sometimes feed in organic matter rather than directly on roots, but can cause significant damage by breaking off roots and root hairs mechanically. So far, most turf insecticides seem to work reasonably well.

### Targeting the perpetrators

Managing grub populations becomes problematic, particularly in areas of the Northeast where three or four species of grubs may occur at the same time in the same lawn. Determine which species is most prevalent or causing the most damage (two different things) and target your controls accordingly.





**Grub damage in turfgrass can be exacerbated by hungry skunks looking for an easy meal. This type of damage isn't uncommon.**

#### Bring 'em in for questioning

The most reliable management approach for billbugs appears to be to target adults just as they emerge from hibernating sites, killing them before they have a chance to lay eggs. The application timing is challenging because there are so many different species that might be present. A degree-day model for the bluegrass billbug, indicates applications targeting adults should be made between 560 and 625 degree days (50°F base temperature).

Applications directed at larvae (after they have begun to feed and damage the plant) often do not work very well, in part because some of the larvae are still in the stems and somewhat protected, while others have dropped to the soil and are hard to

which are often misdiagnosed because their damage occurs when turf can be under summer heat or moisture stress. Several insecticides can reduce their populations, but the damage may remain, especially if the turf is in summer dormancy.

*Webworms* also abound; several species occur in the United States, each with a different life cycle. While webworm damage can be severe, it normally is sporadic and seldom needs attention. Treatments are most effective two or three weeks after peak moth flight. This allows time for eggs to hatch and small, susceptible caterpillars become active.

#### Book 'em Danno

Some perennial ryegrass and fescue cultivars contain endophytes, fungi that grow inside the plant and produce materials toxic to certain insects. These cultivars provide a significant level of resistance to bluegrass billbugs (and apparently some other billbug species), hairy chinch bugs and some webworms. Many endophytic cultivars also are more drought tolerant than their closely matched endophyte-free cultivars.

While Merit™ and Mach 2™ have been so effective, spinosad (Conserve™), a derivative of an actinomycete, a natural soil bacterium, also appears to be very effective against several of the turf caterpillars, including black cutworms and sod webworms, while much less toxic to vertebrates than traditional insecticides. Conserve also has been tested and seems to work well against many of the caterpillars that feed on ornamentals, such as eastern tent caterpillar.

Pay attention to detail and determine the life cycle of the insect, then use an insecticide that is best suited to that pest. **LM**

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It's essential to water in any grub insecticide as soon as possible after application — it's virtually impossible to overwater a grub insecticide, although avoid puddling. One main reason for inadequate grub control is insufficient watering. Ensure that the product is watered in quickly and thoroughly to improve the performance of the product.

#### The usual suspects

Billbugs may be the most misdiagnosed insect pest in the Northeast and are well established in the Middle Atlantic states, Midwest and Plains. Until recently, the bluegrass billbug (*Sphenophorus parvulus*) was assumed to be the primary species in the Northeast and other species less common.

There now are several billbug species that can occur in turf, each with a slightly different life cycle:

▶ The little billbug (*S. minimus*) feeds on the same grass species and has a similar life cycle to the bluegrass billbug.

▶ The uneven billbug (*S. inaequalis*) occurs in the eastern United States and feeds on bermudagrass, Kentucky bluegrass, perennial ryegrass and fescues. Adults are active earlier in the spring and later in the fall than bluegrass billbug.

▶ The Denver billbug (*S. cicatristriatus*) lives in the Rocky Mountains and northern Plains states and has the least synchronized life cycle of cool-season billbugs. It may overwinter as medium or large larvae or as adults. (Spring activity may be delayed if the winter was spent as larvae.)



**The life stages of the turf-damaging white grub: two stages of the pupa, adult, larvae.**

reach. Summer application timing becomes even more challenging if more than one billbug species is present.

#### The lineup

Other insects that also damage cool-season turfgrasses include *hairy chinch bugs*, active in the Midwest and Middle Atlantic,