

# White Grub Control

## An IPM / Agronomic Perspective\*

White grubs are the only insects that commonly damage home lawns and utility turfgrass in Kentucky. White grubs are larval or immature stages of beetles and the two major problem species are Japanese and masked chafer beetles. Both beetles fly and lay eggs mostly in June and July. The eggs hatch by early August and the tiny larvae (white grubs) begin feeding just below the soil surface on the roots of grasses. Most of the feeding damage occurs from late August to mid-October. A damaged root system means reduced ability of grasses to take up water. If the root damage is severe, the grass will turn brown and die.

### White Grubs are Normal in Turfgrass

It is normal to find one to five white grubs per square foot, but sometimes the population escalates in localized lawn areas. When the grass is under heat and drought stress, you may see damage with as few as 10-15 grubs/sq. ft. When the weather is cooler and soil moisture is good, 20 or more grubs/sq. ft. may be necessary to cause damage.

### Preventive Control

Turf management practices that reduce damage caused by grubs include:

- 1) Establishing **tall fescue** turf. Although grubs feed on tall fescue roots, tall fescue is seldom damaged by white grubs. During the mid-August and September feeding period, tall fescue usually is able to replenish (re-grow) its root system at a rate sufficient to counteract grub feeding. During the same feeding period, Kentucky bluegrass roots are not re-growing.
- 2) Consider renovating heavily damaged Kentucky bluegrass turf with tall fescue. Tall fescue is the best adapted grass for Kentucky and numerous turf-type varieties are available. Tall fescue has superior drought resistance, shade tolerance, traffic tolerance and insect/disease resistance.
- 3) Irrigation during drought periods in August and September will usually reduce turf damage caused by grubs. On the other hand, frequent irrigation in June and July may attract egg-laying female beetles and increase egg survival. Therefore, withhold irrigation as much as possible in June and July, but if grub damage starts to occur in late August and September, water frequently.
- 4) Use moderate nitrogen fertilization and apply all, or most, nitrogen in October, November and December. Heavy nitrogen fertilization in the spring and summer will decrease root growth, increase turf stress and accentuate the damage caused by grubs during September and October.
- 5) Raise the summer mowing height to 3 to 3 2 inches. This possibly discourages egg laying in June and July and usually results in a better root system.

### Short-term Problem

The **only time** of year that white grubs damage turf is from late August to mid-October. Grubs are also present in the spring and early summer but spring grub treatments are usually unnecessary

because:

- 1) Grubs don't damage turf in spring, since there is little environmental stress upon the grass, and plenty of actively growing roots.
- 2) Killing grubs in spring does not normally reduce the August-September population of grubs. Egg-laying beetles can fly considerable distances, from nearby properties, to re-infest grub-free turf.
- 3) Immature grubs are not easily killed in the spring, and certainly the pupa and adult stages will not be killed by surface applied insecticides.

### Detecting Grub Problems

How do you decide if grub control is needed?

- 1) During late August through mid-October, watch carefully for signs of irregular patches of chlorotic or brown turf. Grab a handful of the brown grass and see if the turf pulls loose from the soil like lifting a carpet. If it does not pull up easily, the problem is usually related to localized dry spot, female dog damage, fertilizer burn, subsurface rocks or possibly a disease. If it does pull up like a carpet of synthetic grass, then look at the soil surface. Unless birds have already stolen the grubs, the C-shaped white grubs, from 1/4 to 3/4 inches long, will be obvious on the soil surface and the soil will be very loose. Check several suspected spots.
- 2) If you have had serious turf damage from grubs in the past year or so, they are likely to return to the same turfgrass areas.
- 3) During late spring and early fall, large numbers of feeding blackbirds, moles or skunks may be an indicator of white grub problems. However, beneficial earthworms will also attract lots of birds and moles.
- 4) During June and July, locally high numbers of Japanese beetles or the presence of numerous 2" long brown beetles (Masked Chafer) skimming over the turf at dusk may be a good indication of potential grub damage.

### What To Do?

If the grub population warrants control, consider the following:

- 1) By keeping the turf well watered in August and September, you can reduce grub damage.
- 2) Treat suspected or obvious grub damaged areas with an insecticide. Normally the entire lawn or landscape will not need to be treated. The most likely areas that may need treating are **full sun**, south or west-facing **slopes**, **Kentucky bluegrass** turf, areas that were **well irrigated** during June and July, and areas that were **damaged** in past years.
- 3) If you observe grub damage during late August, September or October, the best rescue treatment is a product containing trichlorfon (Dylox/Bayer Advanced Lawn 24-hour Grub Control). When applied, this insecticide **MUST** immediately be watered in with about 2" of irrigation or rainfall in order to get the chemical into the soil where the grubs are feeding. Granular formulations are usually more convenient and sometimes more effective, especially if irrigation cannot be applied immediately after treatment. Irrigation or rainfall

just prior to insecticide application will generally improve the efficacy of the insecticide. To reduce possible run-off, avoid insecticide application just prior to a weather service forecast of heavy rain.

- 4) If white grubs damaged the turf in the previous year, then consider a preventative treatment with one of the following products. These newer insecticides are target-selective, providing low inherent toxicity (except to insects) and low environmental risk. They persist in soil for several months, allowing flexibility in timing of applications. Rainfall or irrigation is needed to water-in the product, but the timing is not critical.

**B Merit** (imidacloprid), i.e. Bayer Advanced Season-long Grub Control. Merit disrupts the insect's nerves in a selective manner. Best to **apply from mid-June to mid-July**, and not later than the third week of July.

**B Mach 2** (halofenozide), i.e. Scotts Grub-Ex. Mach 2 mimics a natural insect molting hormone, causing a premature, lethal molt. Best to apply from **mid-June 15 to mid-August**. It is seldom effective after turf damage begins occurring, i.e. when the white grubs are already large.

- 5) Try to purchase only the amount of insecticide needed for the job and put on only the amount recommended on the label. **Do not** over apply! Grub control applications are based on amounts per 1,000 sq. ft. of area to be treated. Measure the length and width of your turf areas and calculate the total area to be treated. This will give you a good idea how much product to buy. Avoid buying large amounts that will leave you with excess pesticide to store. Usually the product label will give a range of ratios, (for example, 4 to 6 fl oz/1,000 sq. ft). Use the lowest amount (4 fl. oz.). This will reduce potential problems with runoff and will have the least impact on beneficial insects and earthworms.

### **Biological Control**

Unfortunately, there are no proven biological products that will provide reliable control of grubs. Milky disease spores can be purchased but they have not been effective in tests in Kentucky. Also, milky disease has no effect on masked chafer grubs. Beneficial nematodes can also be purchased but their performance has been sporadic at best.

*\* Information related to white grubs was obtained from publications and personal correspondence with Drs. Daniel Potter and Michael Potter, U.K. Entomologists. For more detailed information concerning white grubs, contact your local Extension Agent and ask for the following publications:*

*ENT-5 Japanese Beetles in the Urban Landscape - M.F. Potter, D.A. Potter, and L.H. Townsend*

*ENT-10 Controlling White Grubs in Turfgrass - Michael F. Potter and Daniel A. Potter*

*EntFact-441 Insecticides for Control of White Grubs in KY Turfgrass - Michael F. Potter & Daniel A. Potter*