

## Controlling white grubs without chemicals

By **Bruce Wenning**/ Special To The Tab

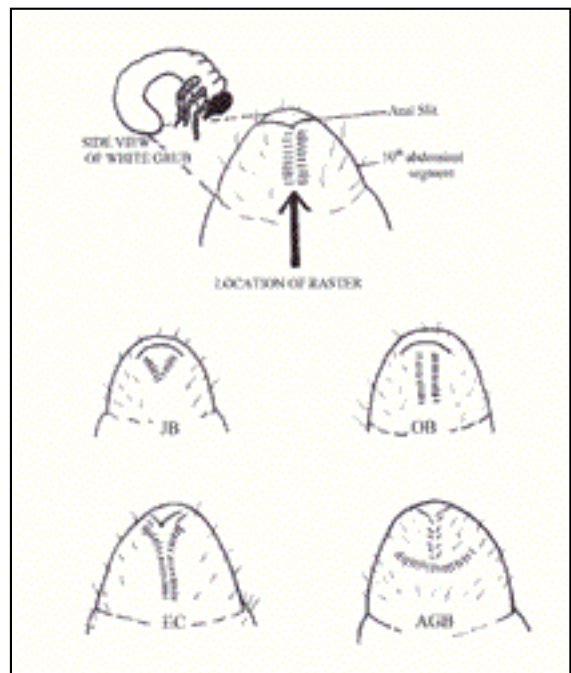
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White grubs are insect pests of home lawns, athletic fields, parks, gardens and anywhere their preferred hosts grow. They live in soil, are C-shaped, have six legs, chewing mouthparts, and feed on turfgrass roots and the roots of other plants. Lawns that are attacked by these pests show poor vigor, thin turf, smaller (or no) roots and bare spots susceptible to weed colonization.

The four white grub species of concern in our area are introduced pests and are very problematic on home lawns. They are Japanese beetle, *Popillia japonica*; Oriental beetle, *Anomala orientalis*; European chafer, *Rhizotrogus majalis*; and Asiatic garden beetle, *Maladera castanea*.

The life cycle for all four species is very similar: there is one generation per year, adult beetles are active during the summer, the grub (larval stage) is actively feeding on turfgrass roots in the fall (August through October) and again in the spring (April through May). It is too often assumed that all white grubs are the insecticide-susceptible Japanese beetles. They are not! And particularly as there are health concerns and environmental problems associated with the misuse and overuse of insecticides for the control of white grubs, it is very important to properly identify white grubs using a 10X hand lens, so that the least toxic control agents will be used. Unfortunately, landscape company personnel typically do not identify grubs by species.

- The Japanese beetle grub has a small distinctive V-shaped rastral (spines) pattern, and a transverse anal slit on the 10th abdominal segment. These grubs are widely distributed in southern New England and are more susceptible (than the other species of white grubs) to chemical and nonchemical controls. Adult JB's feed on nearly 300 species of plants, including trees, shrubs and vines.
- The Oriental beetle grub has a transverse anal slit (like the JB) but exhibits a unique straight and parallel rastral pattern. It is less susceptible to commonly used insecticides because it is quick to burrow down deeper into the soil during hot weather, where it is difficult to control.



- The European chafer has a rastral pattern that is somewhat Y-shaped; rows of rastral spines look like an opening zipper near the anal slit. It is the most damaging to home lawns, causing turf to become easily dislodged from the soil. Sometimes called an "eating machine on lawn roots," it's the only grub that can feed during cold weather, causing root damage in the early spring and well into the fall, when the other grub species are inactive. It has even been detected feeding on lawn roots under snow in February. These grubs are hard to control with insecticides because they are larger in size than the other species and they have genetic characteristics that enable them to metabolize insecticides or avoid them.
- The Asiatic garden beetle has a rastral pattern in the shape of a reduced semi-circle. Imidacloprid (trade name, Merit) is used for chemical control, but it has limited effectiveness. It is suspected that the spread of AGB is due to imidacloprid overuse: the chemical kills the other grub species and allows the expansion of this one.

Fortunately, there are biological control alternative to synthetic insecticides that can reduce the need for chemical control of white grubs. Although there is one commercially available type of nematode, *Steinernema carpocapsae*, that does not provide white grub control, another commercially available nematode, *Heterorhabditis bacteriophora*, has been shown by Dr. Albrecht Koppenhoffer (Rutgers University) to be an effective bio-control agent against Japanese beetle grubs. Dr. Patricia Vittum (University of Massachusetts) has demonstrated satisfactory control for all four species of white grubs using the HB nematode in late summer field trials, but the trials were limited in scope.

IPM Labs entomologist Carol Glenister notes that HB nematodes are most effective when the soil is warm in late summer (mid-August to early September) and the grubs are large. She does not recommend applying nematodes before then. She said that with the proper environmental conditions nematodes will reduce all grub species to varying degrees.

The HB nematode seeks out grubs for food and reproduction. When this nematode enters a white grub through a natural body opening, it releases a bacterium while it feeds on the grubs' internal organs, and this eventually kills the grub. The nematodes then move through the soil to seek out more grubs.

The EPA exempts nematodes from the registration required for chemicals, and protective equipment is not needed to apply them. Commercially available nematodes are specific to pests stated on the label. Read and follow all instructions and be certain that the beneficial nematode matches the biology of the pest in question. To learn more contact: IPM LABS, Locke, N.Y. 315-497-2063, [www.ipmlabs.com](http://www.ipmlabs.com).

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