

Japanese Beetles

The Japanese beetle (order *Coleoptera*) is a major pest of lawns, fruits, and ornamental plants in Delaware. The adult Japanese beetle may feed on more than 275 species of plants. The grub, or immature larval form, is the most serious turf grass pest. Grubs feed underground on the roots of grasses and a wide range of other hosts.

The Japanese beetle has an annual life cycle. Adult beetles emerge from the soil beginning in early June. Peak numbers usually occur in July. Eggs (40-60 per female) are laid in the soil shortly after mating takes place. Adult numbers in large infestations mean high grub feeding in August and September.

Grubs reduce their feeding as the weather cools and days grow shorter. The grub may burrow 6 inches into the soil to as many as 18 inches down and remain inactive until spring. In late March or early April, grubs return to feed on roots of grasses and plants just below the surface. They feed until late May and then pupate.

Description

The adult is about 13 millimeters long. It is a shiny, metallic green beetle with coppery brown wing covers that extend almost to the tip of the abdomen. Small tufts of white hairs occur at the tip of the abdomen and along each side of the wing covers. Japanese beetle eggs are translucent white to cream and elliptical in shape. In just a few days, the egg is more spherical and has doubled in size. The larva (grub) is white and curled in a C-shape. It has a yellow brown head and is about 26 millimeters long when mature. Unlike other grubs, the Japanese beetle has two rows of spines which form a "V" on the underside of the last abdominal segment. Pupae are light brown, but they eventually develop a metallic green cast.

Biology

The Japanese beetle, first reported in North America in 1916, now occurs throughout most of the eastern United States. A special pathogen, milky spore disease, helped reduce the pest status of Japanese beetles after it was developed in the late 1930s. Recently Japanese beetles have become a troublesome pest once again. The grubs occur in lawns, golf courses, and pastures. They burrow through the soil and consume roots. Areas of dead grass appear when large numbers of grubs are present, especially during dry spells in September or early

October. Japanese beetle adults eat flowers and foliage, leaving only a lacy network of leaf veins.

Grub control options:

Plant resistant/tolerant grass varieties: Avoid Kentucky bluegrass, fine fescues, ryegrasses, or bentgrasses. Select instead more tolerant grass species such as tall fescues, zoysia, or Bermudagrass.

Milky Spore Disease: Milky spore disease is the best recommendation for long-term Japanese beetle grub control in housing developments under 8 years of age. Older lawns may already have high levels of effective microbes that control grubs. The effectiveness of granular spore products and other dust formulations has not been tested thoroughly. Other grub species aren't affected by this milky spore.

Milky disease spores remain dormant for many years in the soil, becoming active only when inside the grub. Dying grubs take on a milky white appearance, and after the grubs die, millions of new spores are released into the soil. Milky spore disease does require a low population of grubs for spore multiplication and spread. Effective control (30-60 percent mortality) of the grubs can be expected three or four years after treatment.

Beauveria bassiana (Naturalis T) is a pathogenic fungus that can be used to control white grubs, but avoid applying fungicide within few days before or after applying this product.

Biological control with entomopathogenic nematodes. Several products available commercially contain insect parasitic nematodes. Although these are safe, recent turf tests show them to be only marginally effective against white grubs. Check the active ingredient portion of the product label for the species on the package. *Steinernema carpocapsae* is more effective against the immature stages of caterpillars, fly, and weevil landscape pests.

Trapping. Japanese beetle traps can also be effectively used but traps are best placed far away from the plants that need protection. The traps contain a sex lure and food lure. In years with large flights of adults, traps may need to be emptied daily.

Chemical Controls: Grubs are best controlled when small (less than 1/2 inch long), and when they feed near the soil surface. In Delaware, this requires sampling and treatment for grubs in early August, before extensive damage occurs. Spring grub control isn't necessary because turf can tolerate higher populations at that time and grubs will soon pupate and the materials are not as effective against mature grub. If grub counts exceed the threshold or damage is severe, consider a professional lawn care service. This lessens your exposure and risk in handling, disposing, and storing leftover pesticides. For the home lawn carbaryl (Sevin), halofenozide (Mach2/Grubex), imidacloprid (Advanced Lawn Grub Control) and trichlorfon (Proxol/Dylox). Before using an insecticide for grub control, cut the grass. After treatment, water the lawn immediately for 15-20 minutes. This moves the insecticide down into the soil. Keep pets and people off the treated turf until the grass is completely dry. Insecticides should kill grubs within two to three weeks after application.

Adult damage is more difficult to control due to continuous arrival of new adults. Acephate, carbaryl, cyfluthrin, esfenvalerate, imidaclopid, malathion, methoxychlor, pyrethrins+PBO, tramethrins, and rotenone are labeled on several plants to control Japanese beetle adults.

Pesticides mentioned in this publication are generally listed as the active ingredient or common chemical name. The active ingredient is the chemical in the formulation that is active against the pest. Read the pesticide label to determine if the correct active ingredient is present. Regardless of the product you choose, be sure the plant and/or the pest you want to control is on the label.

Disclaimer: Mention or exclusion of any product is not intended to discriminate for or against any products. No endorsement is intended for the products mentioned, nor is criticism meant for products not mentioned. Please read labels before purchasing and then read them before using to ensure that target sites are listed.