Japanese beetle

Popillia japonica
Order Coleoptera, Family Scarabaeidae; scarab beetles
Introduced pest

Pest information: Turfgrasses, root-feeding grubs; adults feed on foliage of over 300 species of plants, including roses and grapes.

Description: Japanese beetle adults are approximately 13 mm in length. The front of the beetle is dark metallic green and the wing covers are dark tan. There are five small, white patches of short hairs along each side of the dorsal abdomen on the beetle. These patches are a key characteristic for identification. If it does not have these white hair tufts, but it has the other color traits, then it may be the false Japanese beetle.

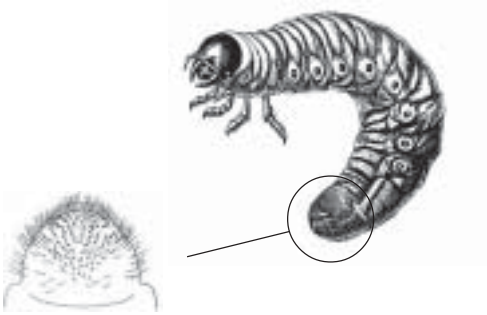
Life history: The larval or grub stage of the Japanese beetle is a "C" shaped white grub that lives in the soil. Its primary food source is grass roots, but they are known to feed on the roots of corn, beans, tomatoes, and strawberries. All species of "white grubs" have similar-looking grubs, but vary in their life cycle, so identifying the grub species is important for the proper timing of pesticide application. Grubs can be identified to species by the pattern of hairs on their brown hindends (raster). Using a 10-power hand lens, you can see that the hairs on the raster of Japanese beetle form a small "V" shape just below the anal slit. (See Drawing). There is a one year life cycle.

Overwintering: Grubs or prepupae in soil.

Damage symptoms: Grubs chew off grass roots and they reduce the ability of grass to take up enough water to withstand the stresses of hot, dry weather. As a result, large dead patches of grass develop in the grub-infested areas. The sod on these dead patches can be rolled back like a carpet to expose the grubs and lack of turf roots. Early recognition of the problem can prevent this destruction. When grubs are close to the surface, starlings and crows, as well as moles, shrews, and skunks may be seen digging up grubs and damaging turf.

Monitoring: Grub populations between 7 and 15 grubs/sq. ft. can cause significant damage to non-irrigated turf. Irrigated turf can withstand a higher grub count because the increase in water compensates for the roots chewed off by the grub. Look for brown patches of turf that pull out of the ground, as the roots have been removed by grub feeding. Identify a grub problem by examining a square foot sample of lawn along the border where dead or damaged grass meets healthy grass. When grub densities are high, the blades pull away from the roots and the turf rolls back like a carpet. A pheromone trap can be used to monitor for adults.

Cultural control: Maintain healthy grass by fertilizing in the spring and fall and watering during periods of drought.



Raster of a Japanese beetle grub. The hind end of the grub is called the raster. It contains sutures and hairs used to identify the grub species.

Japanese beetle adult; note the five tufts on white hairs along the sides of the wing covers. (282)
Photo: Vera Krischik

Japanese beetle (continued)

Chemical control: Effective grub control requires accurate timing of applications to kill the most susceptible stage which is the small grubs. For most of the annual grubs (Japanese beetle, masked chafers, European chafer, Asiatic garden beetle and Oriental beetle), the best treatment time is early August. Halofenozide and imidacloprid are not fast acting and are often used in areas that experienced high damage the previous year; apply from mid-May until early August. Only certain insecticides are effective for late season (September and October) or spring grub control, such as carbaryl, or trichlorfon for rescue treatments. If the product does not work, switch to another product. Reducing thatch and thorough irrigation after making a treatment will increase the chances of success. Do not use broad spectrum insecticides routinely, as they will do more harm than good and will kill the beneficial insects that live in the turf, which can cause pest outbreaks.

Biological control: Carabid ground beetles, staphylinid rove beetles, ants, spiders.

Plant mortality risk: High, if threshold is reached.

Biorational pesticides: *Beauveria bassiana*, halofenozide, nematodes (*Heterorhabditis bacteriophora*, *Steinernema carpocapsae*)

Conventional pesticides: beta-cyfluthrin (adults only), bifenthrin (adults only), carbaryl, chlorpyrifos, cyfluthrin (adults only), deltamethrin (adults only), imidacloprid, lambda-cyhalothrin, permethrin, trichlorfon