

Virginia Cooperative Extension

A partnership of Virginia Tech and Virginia State University

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Japanese Beetles

The Japanese beetle is a serious plant pest. Introduced from Japan in the early 1900's, the beetle is known to feed on over 300 plants in the Southeastern United States. The adult beetle is particularly fond of plants with yellow and white flowers, especially roses, and plants with red or purple leaves. Feeding is most often observed on warm, sunny days on plants in full sun.

DESCRIPTION

The adult beetle is approximately a 1/2 inch long. The body is shiny metallic green with copperybrown wings. Males and females look similar. The larva, or grub, is about an inch long when full grown. It has a characteristic off-white, C-shaped body with a yellowish-brown head. Grubs are found in the soil, particularly under turfgrass.

BIOLOGY

Both the larva (grubs) and adults (beetles) have chewing mouthparts. Grubs consume roots of turf grass. When grubs are numerous, patches of turf appear dried out and peel back like a carpet. Adults feed on leaves, buds, flowers, and fruits. As the adults do not feed on leaf veins, infested leaves have a characteristic skeletonized appearance. Flowers and buds have ragged edges after beetle feeding.

Beetles overwinter as grubs about 6-18 inches in the soil. They become active in early spring as the ground thaws, and begin feeding on grass roots. In late spring they stop feeding, form a pupal stage, and transform into a flying adult beetle. The adult emerges from the soil from early June to July and begins feeding on plant material, usually through the end of August. During late summer the female

selects poorly drained soil in which to deposit her eggs. She burrows into the soil, laying several eggs at a time until 40 - 60 eggs are produced. Grubs hatch in about 10 days, and begin to feed on grass roots. In the fall, as soil temperatures decrease, the new generation of grubs migrate down into the soil to overwinter.

A dry summer will usually reduce the number of live grubs produced. Decreased rainfall in spring or fall does not have much impact because grubs are larger at these times and more resistant to dry conditions.

CONTROL OF GRUBS



Adult Beetle



Grub

Treatment for grubs is necessary only when 8 - 10 grubs are found under one square foot of turf.

To control grubs, several options are available.

Milky Spore© is a naturally occurring bacterium (*Bacillus popilliae*) that is fatal to grubs, but entirely harmless to humans, pets, and other beneficial insects. It is effective only against the grub stage. The spore will remain inactive until ingested by a grub. Once ingested, the bacteria multiplies and creates new spores that are released when the grub dies. It may take 2-3 years for Milky Spore to achieve desired results. Be patient. Once active, the spore will keep controlling grubs for more than 20 years. **Do not apply insecticides to Milky Spore**

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treated areas as this will negate the effect of the bacteria. Try to get your neighbors to apply Milky Spore with you; otherwise, adults from their yard will continue to fly into your yard. Milky Spore is sold as spreadable granules and as a concentrated powder.

A **pathogenic fungus**, *Beauveria bassiana*, has also been found effective against grubs. The fungus is sold as Naturalis – T. It should not be applied within several days of any fungicides.

White grubs can also be controlled by **entomopathogenic nematodes**. Look for products containing *Steinernema riobrave* or *Heterohabditis* sp. as their active ingredient. Products containing *Steinernema carpocapsae* are to be applied only when the pest is present, and not as a control.

CONTROL OF ADULT BEETLES

Most plants can tolerate moderate defoliation. While damage by beetles is not aesthetically pleasing, plants will not die unless complete defoliation continues for several years.

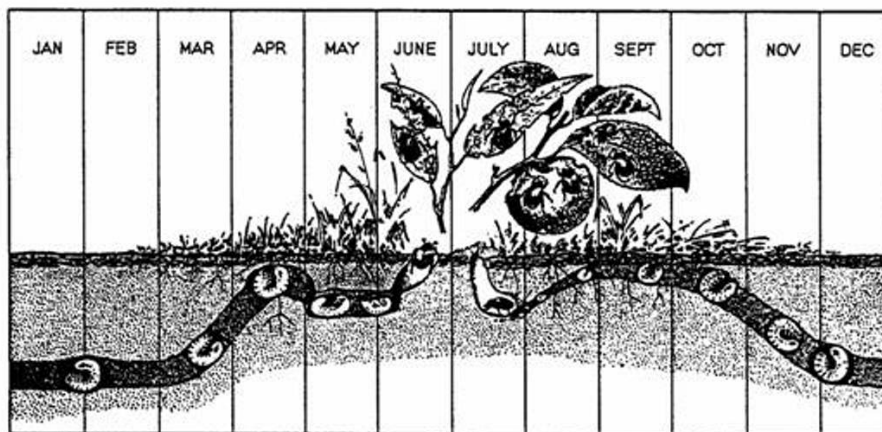
Adult Japanese beetles can be controlled by mechanical means. As the beetles tend to be sluggish early in the morning, **hand picking** or shaking plants to allow beetles to fall into pans of soapy water is an option. If you need to protect only a few prized rose blooms, **floating row cover** can be tied around the blossoms.

Traps containing lures of different types are

commonly available. If enough are placed in a area, at least 30 feet from attacked plants, they can control a high number of beetles. Get together with your neighbors and place them throughout your yards. Do not put out a single trap, as this will tend to attract beetles from the entire neighborhood into one, concentrated area. Traps work best if combined with other natural controls.

For **chemical** control of adult beetles, acephate, carbaryl (Sevin), cyfluthrin, esfenvalerate, Imidicloprid., malathion, pyrethrins+PBO, and Tetramethrin are effective. Repeated sprays on leaves of susceptible plants at 2 week intervals or between rains may be needed as adults will continue to migrate to plants. Follow label instructions. Carbaryl products are highly toxic to honeybees; apply only in late afternoon or dusk when bees are inactive. These products will also kill predators of mites, but won't kill mites. A subsequent outbreak of mites may follow applications of Sevin and other carbaryl products.

Rotenone is a naturally occurring insecticide derived from certain plants found in Central and South America. It has proven somewhat effective in controlling adult beetles. Be sure to read the label. While “natural,” it is still an insecticide.



Typical life cycle of the Japanese beetle