



## Japanese Beetle



### Distribution

This imported pest is generally found east of a line running from Michigan, southern Wisconsin and Illinois, south to Alabama. Occasional introductions are made into western states such as California and Oregon when the adult beetles or larvae are shipped in commerce. The original population was detected in New Jersey in 1916, having been introduced from Japan. In Ohio, the most damaging populations are east of a line running from Cleveland to Cincinnati.

### Hosts

The adult beetles are general herbivores and are known to feed on over 400 species of broad-leaved plants, although only about 50 species are preferred. The grubs will also feed on a wide variety of plant roots including ornamental trees and shrubs, garden and truck crops, and turf grasses. They seem to especially relish Kentucky bluegrass, perennial ryegrass, tall fescues and bent grass.

### Damage Symptoms

The adults are skeletonizers, that is, they eat the leaf tissue between the leaf veins but leave the veins behind. Attacked leaves look like lace that soon withers and dies. The adults will often attack flower buds and fruit. The grubs can kill small seedling plants but most commonly damage turf. The turf first appears off-color as if under water stress. Irrigating causes a short-lasting response or no response at all. The turf feels spongy under foot and can be easily pulled back like old carpet to reveal the grubs.

### Description of Stages

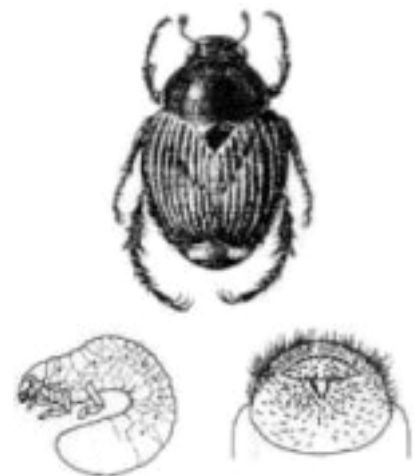
The life stages of the Japanese beetle are typical of white grubs.

**Eggs:** The white oval eggs are usually about 1/16 inch (1.5 mm) long and 3/64 inch (1.0 mm) wide. They are placed in the soil where they absorb moisture and become more roundish.

**Larvae:** The larvae are typical white grubs that can be separated from other soil dwelling white grubs by the presence of a V-shaped series of bristles on the raster. First instar larvae are about 1/16 inch (1.5 mm) long while the mature third instars are about 1-1/4 inch (32 mm) long.

**Pupae:** The pupae are first cream colored and become light reddish-brown with age. The average pupa is about 1/2 inch (14 mm) long and 1/4 inch (7 mm) wide.

**Adults:** The adults are a brilliant, metallic green color, generally oval in outline, 3/8 inch (10 mm) long and 1/4 inch (7 mm) wide. The wing covers are copper brown and the abdomen has a row of five tufts of white hairs on each side.



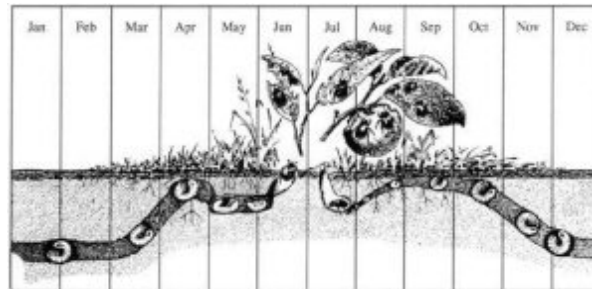
**Adult (top), Grub (bottom left), raster pattern (bottom right)**

## Life Cycle and Habits

Larvae that have matured by June pupate and the adult beetles emerge from the last week of June through July. On warm sunny days the new beetles crawl onto low growing plants and warm for a while before taking flight. The first beetles out of the ground seek out suitable food plants and begin to feed as soon as possible. These early arrivals begin to release a congregation pheromone (odor) which is attractive to adults that emerge later. These odors attract additional adults to gather in masses on the unfortunate plants first selected.

After feeding for a day or two, the females leave feeding sites in the afternoon and burrow into the soil to lay eggs at a depth of 2 to 4 inches. Females may lay 1 to 5 eggs scattered in an area before leaving the soil. These females will leave the following morning or a day or two later and will return to feed and mate. This cycle of feeding, mating and egg laying continues until the female has laid 40 to 60 eggs. About 95% of population is generally laid by mid-August, though adults may be found until the first frost of fall.

If the soil is sufficiently moist, eggs will swell in a few days. Egg development takes only 8 to 9 days at 80 to 90 degrees F or as long as 30 days at 65 degrees F. The first instars larvae dig to the soil surface where they feed on roots and organic material. If sufficient food and moisture are available, the first instars can complete development in 17 days at 78 degrees F.



*Japanese Beetle Life Cycle*

## Control Strategies

**Option 1: Cultural Control- Quarantine** - Japanese beetle quarantines are currently operated by the USDA-APHIS and states involved with shipping materials out of infested areas to uninfested areas. Though this has not stopped the slow progression of Japanese beetles westward, it seems to have slowed the process.

**Option 2: Cultural Control - Habitat Modification** - Since the eggs and young grubs are very susceptible to dry soils, do not irrigate during the time the eggs and first instar larvae are developing. However, if natural rainfall occurs, this tactic will not work. Do not plant trees and shrubs that are highly attractive to adult Japanese beetles near turf. Trees and shrubs most attractive to adults include: Japanese and Norway maple, birch, pin oak, horse chestnut, rose of sharon, sycamore, ornamental apple, plum, cherry, rose, mountain ash, willows, lindens, elms and Virginia creeper. Trees and shrubs rarely attacked include: red and silver maple, holly, boxwood, euonymus, flowering dogwood, cedar, juniper, arborvitae, red oak, tulip tree, magnolias, red mulberry, forsythia, ashes, privet, lilac, spruces, hydrangeas and taxus (yew).

**Option 3: Mechanical Control - Trapping** - Several traps have been developed to capture the adults. These traps generally use a mixture of the aggregation and sex pheromones. Recent data indicate that these traps do not significantly reduce grub populations and in some cases may actually contribute to increased foliar plant damage.

**Option 4: Chemical Controls - Insecticides** - When using trapping to monitor adult activity, keep in mind that the females lay the majority of their eggs within the first 7 to 10 days of their existence. When applying insecticides it becomes difficult to accomplish long-term control due to the number of generations produced. Applications may need to be made several times per season.

Information obtained through the Ohio State Extension FactSheet HYG-2504-91



*Insect and Disease Fact Sheet Compliments of New Century*



[www.newcenturytree.com](http://www.newcenturytree.com)

1-877-79TREES