



# JAPANESE BEETLES

The Japanese beetle (*Popillia japonica* Newman) was first discovered in the United States in a nursery in southern New Jersey in 1916. It quickly spread across the eastern U.S., arriving in Chicago in 1932 and into St. Louis in 1936. It was largely confined to urban Illinois until the late 1990s when as yet unknown factors allowed it to become a major pest in many rural areas.

## Damage Description

Japanese beetle adults and larvae (grubs) are destructive plant pests. Adults feed on the foliage and fruits of several hundred species of fruit and ornamental trees, shrubs, vines, and field and vegetable crops. Adult beetles prefer to feed on the upper surface of leaves, especially those in full sun. They leave behind skeletonized leaves and large, irregular holes in leaves.

Host plants include many of our garden annual and perennial flowers as well as shrubs and trees, including fruit plants. Hardest hit include roses, linden, birch, maple, viburnum, hibiscus, grapes, zinnia, canna, apples, blackberries, raspberries, peaches, and cherries. Japanese beetle larvae develop in the soil, feeding mainly on grass roots and causing large patches of turf to turn brown. They often destroy turf in lawns, parks, golf courses, and pastures.

Damage is not limited to landscape plantings. Farmers also have to contend with Japanese beetles in their fields. The beetles will munch on the leaves of soybean plants.



*Japanese beetle feeding results in leaves full of holes (skeletonizing)*

## Adult Description

The adult Japanese beetle is just under ½ inch long and has a shiny, metallic-green body and bronze-colored wing covers. There are six small tufts of white hairs along its side.



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*Japanese Beetle Grub*

## Larval Description

The larva is a C-shaped grub that will be about 1 inch long at maturity and are usually found in a curled position. The grub will have a brown head and grayish-black rear end. The pattern of hairs on the last body segment (raster) will form a “V” shape just below the anal opening.

Shortly after the adult female lays her eggs in the summer, the larva will hatch and begin feeding. The larva will molt twice before moving below the frost line to spend the winter months. The following spring, the larva will resume feeding and molt twice more before emerging as an adult in the early summer months.

Raccoons and skunks frequently dig holes in lawns looking for the beetle larva.

Sample your lawn for Japanese beetle larvae in late summer (August to October). If your lawn has brown or dead areas, sample there first. Dig a square hole approximately 8 x 8 x 3 inches deep and search the soil and roots for the characteristic C-shaped larvae.

Repeat this activity in a number of locations so you can map out the infested area. Generally, you should consider treatment if your lawn has an average of more than four or five larvae per square hole.

## Control

Adult beetles usually emerge from the soil in early summer. Once the insects have emerged from the soil, they start searching for food and a mate. This search is aided by a chemical pheromone that allows males and females to find each other. This chemical signal can travel far, and the beetles are strong flyers determined to find the source. The beetles will meet on various host plants, feed, and mate. The female periodically leaves the plant and lays a clutch of several eggs about 3 inches deep in the ground. Typically, this behavior will begin to taper off by late summer.

Control of adults can be difficult. Insecticides can reduce damage, but applications may need to be repeated every three to four days since new migrations of beetles can occur daily. Physically removing beetles from plants can be an effective control measure in small areas. By removing beetles and dropping them into a container of soapy water to kill them, the pheromone they release to attract other beetles is removed as well. Smaller or more valuable plants can be protected with floating row covers.

Japanese beetle traps are generally **not** recommended because the pheromone tends to bring more Japanese beetles into the area than are captured.

In rural areas, consider placing traps a quarter mile away from susceptible plantings. And if you do decide to use a trap, be prepared to change it very often. Commercial trap bags hold only about 4,000 beetles.

## Why Traps Are Not Recommended

The photo below shows the approximately 10,000 beetles that were caught in a Japanese beetle trap in one day.



Japanese beetles are attracted to the pheromone on a trap. These beetles, in turn, attract even more beetles into the area.

## Biological Control

Grubs may be biologically controlled with the use of milky spore disease, *Bacillus papillae*, which is available in several formulations such as Milky spore powder, Japidemic, and Doom. This disease is introduced to the soil so that when the grubs begin feeding, they catch the disease, turn milky white, and later die. However, effectiveness of these products varies greatly.

## Chemical Control

Whatever product you choose, make sure that Japanese beetle control is listed on the label. Read and follow all label directions. Do not apply chemicals at higher rates than listed on the label.

Chemical control options are listed on the next page. For more information regarding chemical control of adult Japanese beetles or their grubs, contact your local U of I Extension office, [www.extension.uiuc.edu](http://www.extension.uiuc.edu).

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## Chemical Control for Japanese Beetle Larvae

Name	Active Ingredient	Precautions
Sevin	carbaryl (carbamate)	High toxicity to bees, earthworms; moderately toxic to birds, fish Do not use near water "General Use"
Diazinon Dylox Mocap	diazinon trichlorfon ethoprop (Organophosphates)	High toxicity to birds, fish Do not use near water "General Use"
Mach2 GrubEx	halofenozide (diacylhydrazine)	Insect growth regulator Low toxicity to birds, fish "General Use"
Merit	imidacloprid (neonicotinyI)	Low toxicity to birds, fish Do not use after August 15, instead use diazinon, ethoprop, or trichlorfon "General Use"
Astro Battle Scimitar Others	permethrin $\lambda$ -cyhalothrin (pyrethroids)	Some formulations may be Restricted Use Pesticides and unavailable without a license High toxicity to fish

## Chemical Control for Japanese Beetle Adults

Name	Active Ingredient	Precautions
Sevin	carbaryl (carbamate)	High toxicity to bees, earthworms; moderately toxic to birds, fish Do not use adjacent to water "General Use"
Malathion	malathion (Organophosphate)	High toxicity to honeybees Odor may be a problem in public places "General Use"
Astro DeltaGard Talstar Tempo Others	permethrin deltamethrin bifenthrin cyfluthrin (pyrethroids)	Some formulations may be Restricted Use Pesticides and unavailable without a license High toxicity to honeybees, birds, fish Do not use adjacent to water
Neem oil	azadirachtin	Derived from neem trees "organic"
Various	spinosad (spinosyn A & D)	"organic"