DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
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Agriculture and Natural Resources

Common Questions About Japanese Beetles in Arkansas

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Arkansas currently has three counties infested with the Japanese beetle (Figure 1). The following is general information to help homeowners deal with Japanese beetles.

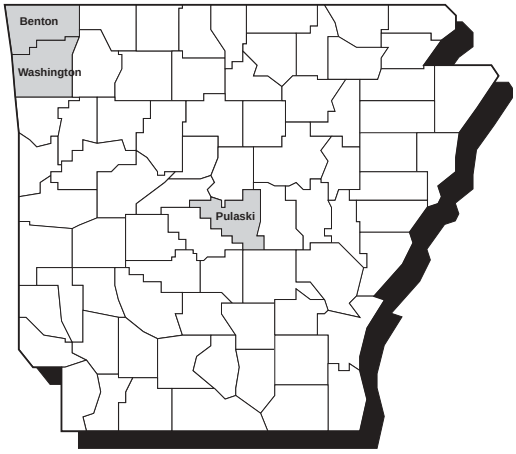

Figure 1.

What Are Japanese Beetles?

The Japanese beetle, *Japonica popilla*, is a scarab beetle. Beetles are insects that have a complete life cycle, i.e., they have eggs, larvae, pupae and adult stages. The Japanese beetle larva or grub stage (Figure 2) and the adult stage are the stages that cause problems for homeowners.

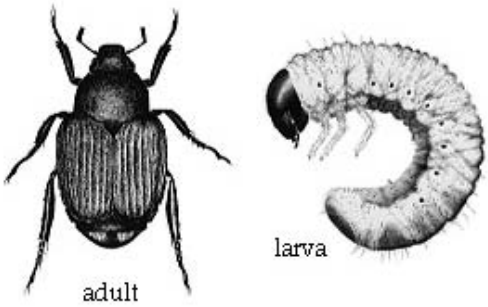

Figure 2.

Japanese beetle eggs are laid several days after the adults appear. Generally, in late July and early August, the eggs are laid into turf near an adult host feeding site. The eggs are approximately 1/8 inch in size. A larva or grub emerges from the egg. The grub stage lasts up to 9 months in the soil. Grubs feed on the plant and grass roots, preferring ryegrass. Japanese beetle grubs are distinguished from non-Japanese beetle grubs by the presence of a v-shaped pattern of hairs on the underside of the abdomen (hand lens needed) (Figure 3). The pupal stage lasts only 7 to 14 days, but an adult emerges from the pupal case from late June through July (Figure 4, top of page 2).

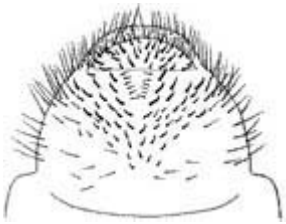

Figure 3.

The adult stage is the foliar feeding stage. The adults are distinguished from the "June beetle" by size and coloration. A Japanese beetle adult is 1/3 to 5/8 inches long with twelve white tufts which can be seen below the wings along the abdomen.

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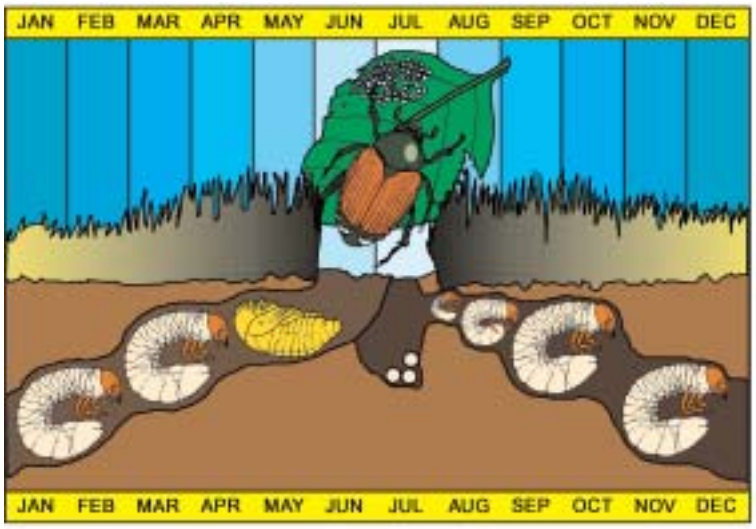

Figure 4.

Where Did They Come From?

Originally from Asia, Japanese beetles were brought over to the United States in 1917 into New Jersey. Currently the insect can be found established in all states east of the Mississippi River, except for Florida. It is believed they arrived in Arkansas in the late 1990s, from nursery stock that was infested with the grub stage. It was first detected in Arkansas in 1997.

Why Do You Always See the Beetles in Groups?

Japanese beetle feeding produces odors which act as pheromones to attract other Japanese beetles to the area to feed and mate. Plant odors attract both sexes to potential food sites. Pheromones are chemical odors used by insects to communicate.

How Can I Kill Japanese Beetles?

There are several methods to kill the beetle – contact insecticides being the most used. To kill the grub stage beetle, timing of application is critical.

Grub Stage Control			
Chemical Name	**Brand Name**	**Formulation**	**Comments**
Preventative Control	**These products are meant to be applied BEFORE a potential grub problem develops. Most suited for HIGH-RISK sites with a history of grub problems, or where heavy beetle activity was noted.**		
Imidacloprid	Merit®** GrubX®**	G, WP	Merit® (professional use) and Grub X® (homeowner use) are applied prior to egg laying and are effective against young, newly hatched grubs. Can be applied late June to mid-July, OPTIMUM treatment period is mid-July. Ineffective as curative or rescue treatment against large grubs.**
Halofenozide	Mach 2®**	G, L	Mach 2® (professional use only) is effective against young grubs. Timing is the same as Merit® (see above). May also be used for early curative control, although it is slower and generally LESS effective than trichloron against large grubs.
Curative Control	**Products listed for curative control are normally applied in August or September, after the eggs have hatched and grubs are present.****		
Trichlorfon	Dylox®**	G, SP	Professional and homeowner use. Good for rescue treatments against larger grubs. Relatively good at penetrating thatch.
Bendiocarb	Turcam®**	G, WP	Professional use only. Very toxic to earthworms. Generally less effective than trichlorfon.
Carbaryl	Sevin®**	G, L	Professional and homeowner use. Very toxic to earthworms. Generally less effective than trichlorfon.
**Products have not been field tested in Arkansas.			

To kill the adult stage beetle there are various contact insecticides which can be used.

Commercial Applicators	Homeowners
Cythion® 57% EC (a.i. malathion)	Malathion 50 Plus® (a.i. 50% malathion)
Dymet® 20/10 EC (a.i. methoxyclor + diazinon)	Fruit and Vegetable Spray® (a.i. 0.01%) pyrethrin
Marlate® 50%WP (a.i. methoxyclor)	Ortho Bug-B-Gon® (esfenvalarate)
Marlate® 25%WP (a.i. methoxyclor)	Sevin 5® (a.i. 5% carbaryl)
Sevin® 50% WP (a.i. carbaryl)	Sevin 10® (a.i. 10% carbaryl)
Orthene® 75 S (a.i. acephate)	Ortho Isotox® (a.i. 8% acephate)
TEMPO® 20 WP (cyfluthrin)	Bayer Advance Garden Power Force® (cyfluthrin)
To maximize the effectiveness of the products used, READ AND FOLLOW THE LABEL INSTRUCTIONS. Japanese beetles should be listed on the label as an insect the product controls.	

Do Japanese Beetle Traps Work?

Figure 5.

Japanese beetle traps do work in that they capture adult beetles (Figure 5). However, placement is critical. DO NOT place the traps near any plant material you do NOT want the beetles feeding on. Although the trap is quite effective in attracting the beetle, only about 70 percent of the beetles end up in the trap. Research has shown that putting the traps in the perimeter of the property well away from valuable plantings or vulnerable crops may be the best use of the traps. Traps work better if you also get your neighbors to set out traps. Use a community-wide approach of 25 to 49 traps per square mile.

What Are Some Natural Ways to Control Japanese Beetles

Arkansas' Japanese beetle populations are isolated in many areas, and hand collecting the adults may be an option. Look for the adults on foliage and in or around the flower heads prior to the mid-day heat.

A natural enemy of the Japanese beetle is *Istocheta aldrichi*, a Tachinid fly. It parasitizes newly emerged adults. The problem with this organism is that it affects the first emerging beetles only, with the majority of beetles emerging several weeks later.

Biological Control – Grub Stage			
Chemical Name	**Brand Name**	**Formulation**	**Comments**
Biological/Microbial Insecticides	**The following products are derived from living organisms. In general, they tend to be LESS RELIABLE than conventional insecticides for control of grubs.**		
Milky disease (*Bacillus popilliae*)	Milky Spore®	Powder	Poor performance in Kentucky field trials.
Fungal disease (*Beauveria bassiana*)	Naturalis-T®		Poor performance in Kentucky field trials.
Entomopathogenic nematodes (*Steinerema carpocapsae, S. glaseri, Heterorhabditis bacteriophora*)	Several products		Requires moisture for optimum performance. Do NOT apply when weather conditions are hot and/or dry. Inconsistent in Kentucky field trials.

What Can I Do to Minimize Their Presence in My Yard?

When purchasing plant material in infested areas, ask the nursery owner about what they are doing to minimize the potential for Japanese beetle.

Plant trees and shrubs that are NOT preferred hosts of the adult beetle. Preferred hosts are those trees nearly always attacked by adult Japanese beetles. The following is an example of preferred and non-preferred hosts of Japanese beetle adults.

Rose enthusiasts should note that roses are a preferred host of the adult. The white- or yellow-flowered cultivars are somewhat more attractive and susceptible than ones with darker flowers, but generally Japanese beetle will feed on all rose cultivars.

USDA-APHIS-PPQ has the U.S. Domestic Japanese Beetle Harmonization Program that restricts movement of plant material out of the Quarantine area. Contact the Arkansas State Plant Board for more information about the Harmonization Program.

Preferred Hosts	**Non-Preferred Hosts**
Flowering Crabapple (*Malus* sp.)	White Ash (*Fraxinus americana*)
Gray Birch (*Betula populifolia*)	Green Ash (*Fraxinus pennsylvanica*)
Hollyhock (*Atlhaea rosea*)	Holly (*Ilex* sp.)
Japanese Maple (*Acer palmatum*)	Red Maple (*Acer rubrum*)
Norway Maple (*Acer platanoides*)	Silver Maple (*Acer saccharinum*)
Rose of Sharon (*Nibiscus syriascus*)	American Sweetgum (*Liquidamar styraciflua*)
Cherry, Plum, Peach (*Prunus* sp.)	Magnolia (all species)
Black Walnut (*Juglans nigra*)	Rhododendron (*Rhododendron* sp.)
Roses (*Rosa* sp.)	White Oak (*Quercus alba*)
Table Grapes (*Vitis* sp.)	Scarlet Oak (*Quercus cocinea*)
American Linden (*Tilia Americana*)	Red Oak (*Quercus rubra*)
Rose Mallow (*Lavatera trimestris*)	Tuliptree (*Lirodendron tulipifera*)
Cigar Flower (*Cuphea ignea*)	Common Pear (*Pyrus communis*)
Crape Myrtle (*Lagerstroemia* sp.)	Flowering Dogwood (*Cornus florida*)

Grub: a scarbaciform larva; a thick bodied larva with a well-developed head and thoracic legs, without abdominal prolegs, and usually sluggish.
Larva: the immature stage, between egg and pupa, of a insect having complete metamorphosis.

Definitions from *The Introduction to the Study of Insects*, Borror, Triplehorn, Johnson, 6th edition. Saunders College Publishing. 1989.

Much of the information obtained for this fact sheet was taken from the University of Kentucky publications ENT 5, ENT 10 and Entfact 441, M. F. Potter, D. A. Potter and L. H. Townsend authors, UK, Lexington, KY, USA, and UA-CES publication MP 399, "A New Pest in Arkansas," G. Lorenz, et al.

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