Kansas State University Department of Entomology Newsletter

For Agribusinesses, Applicators, Consultants, Extension Personnel & Homeowners

Department of Entomology
123 West Waters Hall
K-State Research and Extension
Manhattan, Kansas 66506
785-532-5891
http://www.entomology.ksu.edu/extension

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Japanese Beetles Are Back!

Japanese beetle adults are out in full-force in certain regions of Kansas feeding on different plant species, but especially roses (*Rosa* spp.). The means of dealing with the adult stage of Japanese beetle are limited, and have been for many years, with the use of insecticides still being the primary plant protection strategy. Japanese beetle, *Popillia japonica* is native to Japan and was first reported in the United States in 1916 in the state of New Jersey. Currently, Japanese beetles are established from Maine to Georgia and in nearly every state east of the Mississippi River and several mid-western states.

Figure 1. Japanese beetle adult (Author-Raymond Cloyd, KSU)

Japanese beetles are established in eastern and central portions of Kansas, and are slowly moving westward. Japanese beetle adults are one of the most destructive insect pests of horticultural plants in both landscapes and gardens. The larvae or grub is a major turfgrass insect pest in home lawns, commercial settings, and golf courses.

Japanese beetle adults are 9/16 of an inch in length and metallic green with coppery-brown wing covers (Figure 1). There are about 14 tufts of white hair present along the end of the abdomen (Figure 2). Adult Japanese beetles emerge from the soil and live from 30 to 45 days feeding on plants over a four-to-six-week period. Adults feed on many ornamental plants including: trees, shrubs, vines, herbaceous annual and perennials, and of course—roses. Plant placement in the landscape and volatiles emitted by plants are factors that can influence adult acceptance. Moreover, Japanese beetle adults produce aggregation pheromones that attract individuals (both males and females) to the same feeding location. Adults can fly up to five miles to locate a feeding site; however, they tend to fly only short distances to feed and lay eggs.

Figure 2. Japanese beetle adult. Note tufts of white hair on the end of the abdomen (Author-Raymond Cloyd, KSU)

Japanese beetle adults feed through the upper leaf surface (epidermis) and leaf center (mesophyll), leaving the lower epidermis intact. Adults usually avoid feeding on tissue between leaf veins, resulting in leaves appearing lace-like or skeletonized (Figure 3). They are most active during warm days, feeding on plants exposed to full sun throughout the day, which is likely why roses are a susceptible host plant because

roses require at least six hours of direct sunlight in order to flower. Japanese beetle adults start feeding at the top of plants, migrating downward after depleting food sources. Japanese beetle adults aggregate in masses on rose flowers (Figure 4). Although adult beetles feed mainly on flowers, they will also feed on leaves (Figure 5). Adults chew holes in flower buds; preventing flowers from opening or causing petals to fall prematurely. Furthermore, adults will consume entire rose petals, and feed on the pollen of fully-opened flowers.

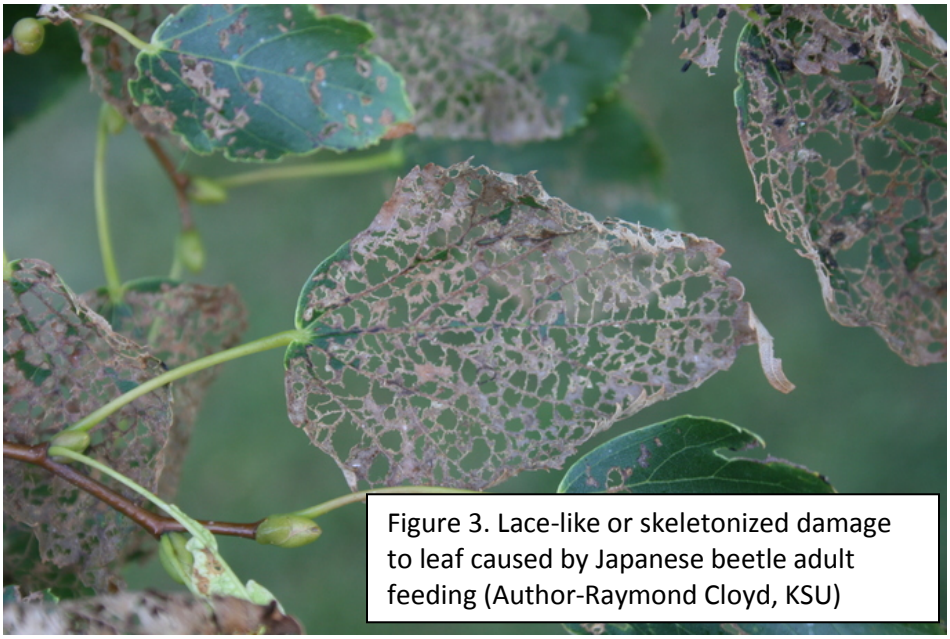

Figure 3. Lace-like or skeletonized damage to leaf caused by Japanese beetle adult feeding (Author-Raymond Cloyd, KSU)

Figure 4. Japanese beetle adults aggregating on rose flower (Author-Raymond Cloyd, KSU)

Japanese beetle adult management involves implementing a variety of plant protection strategies, including: cultural, physical, and insecticidal. Cultural is associated with maintaining healthy roses through proper irrigation, fertility, mulching, and pruning, which are important in minimizing "stress, which may

Figure 5. Japanese beetle adults feeding on linden (Tilia spp.) leaf (Author-Raymond Cloyd, KSU)

possibly decrease susceptibility. In addition, removing weeds such as smartweed (*Polygonum* spp.) that are attractive to Japanese beetle adults may alleviate infestations. Physical involves hand-picking or collecting Japanese beetle adults from roses before populations are extensive. The best time to hand-pick or collect adults is in the morning when ambient air temperatures are typically "cooler." Adults can be easily collected by placing a wide-mouthed jar or bucket containing rubbing alcohol (70% isopropyl alcohol) or soapy water underneath each adult, and then touching them. Adults that are disturbed fold their legs perpendicular to the body, and fall into the liquid and are subsequently killed. This procedure, when conducted daily or every-other-day, particularly after adults emerge, may substantially reduce plant damage. The use of Japanese beetle traps (Figure 6) is not recommended since the floral lure and synthetically-derived sex pheromone (Figure 7) may attract more adults into an area than would "normally" occur. Japanese beetle adults may also feed on roses before reaching the traps, which increases potential damage.

Figure 6. Japanese beetle trap (Author-Raymond Cloyd, KSU)

Spray applications of contact insecticides will kill Japanese beetle adults. However, repeat applications will be required;

Figure 7. Floral lure (on left) and sex pheromone (on right) associated with Japanese beetle trap (Author-Raymond Cloyd, KSU)

especially when populations are excessive. In addition, thorough coverage of all plant parts will increase effectiveness of the application. The insecticide carbaryl (Sevin®) and several pyrethroid-based insecticides including those containing bifenthrin or cyfluthrin as the active ingredient can be used to suppress Japanese beetle adult populations. However, most of these insecticides also directly harm many natural enemies (parasitoids and predators) so their continual use may lead to secondary pest outbreaks of other pests including the twospotted spider mite (*Tetranychus urticae*). Furthermore, these insecticides are directly harmful to honey bees and bumble bees. Therefore, applications should be conducted in the early morning or late evening when bees are less active. In general, systemic insecticides, are not effective because Japanese beetle adults have to feed on leaves and consume lethal concentrations of the active ingredient. If extensive populations are present, then damage to plants may still occur.

The battle against Japanese beetle adults requires patience, persistence, and diligence in order to prevent adults from causing substantial damage to roses and other susceptible plants.

Raymond Cloyd

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Insect Diagnostic Laboratory Report

http://entomology.k-state.edu/extension/diagnostician/recent-samples.html

Eva Zurek

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Sincerely,

Raymond A. Cloyd
Professor and Extension Specialist
Horticultural Entomology/Integrated Pest Management
Phone: 785-532-4750
Fax: 785-532-6232
e-mail: rcloyd@ksu.edu

Eva Zurek
Insect Diagnostician
Phone: (785) 532-4710
e-mail: ezurek@ksu.edu

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