Kansas Insect Newsletter

For Agribusinesses, Applicators, Consultants and Extension Personnel

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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OH…NO…JAPANESE BEETLES ARE HERE!

As many of you are well aware, Japanese beetle adults are out in full-force feeding on one of their favorite host plants…roses. The means of dealing with the adult stage of this insect pest are limited, however, and have been for many years, primarily relying on the use of insecticides. Japanese beetle, *Popillia japonica* is native to Japan and was first reported in the United States in 1916 in the state of New Jersey. Since then, it has spread throughout the country from Maine to Georgia becoming permanently established in nearly every state east of the Mississippi River and several states westward. Japanese beetles have been established in eastern Kansas. The adult is one of the most destructive insect pests of horticultural plants in both landscapes and gardens. The larvae or grub stage is a major turfgrass pest in home lawns, commercial settings, and golf courses.

Adult Japanese beetles emerge from the soil and live from 30 to 45 days feeding on plants over a four to six week period. They feed on many ornamental plants including trees, shrubs, vines, herbaceous annual and perennials, and of course—roses. Placement of plants in the landscape and volatiles emitted by plants are factors that may influence adult acceptance for feeding. Japanese beetle adults produce aggregation pheromones that attract individuals (both males and females) to the same feeding location. Adults may fly up to five miles to locate a feeding site; however, they tend to fly only short distances to feeding and egg-laying sites.

Japanese beetle adults feed through the upper leaf surface (epidermis) and leaf center (mesophyll), leaving the lower epidermis intact. They typically avoid feeding on tissue between leaf veins, which results in leaves appearing lacelike or skeletonized. Adults are most active during warm days, feeding on plants that are exposed to sunlight throughout the day. This is likely why roses, which require at least six hours of direct sunlight, are

such a susceptible host plant. They also tend to initiate feeding at the top of plants, migrating downward after depleting food sources. Japanese beetle adults congregate in large numbers on rose flowers. Although adult beetles feed primarily on flowers, they will also feed on leaves. Japanese beetle adults chew holes in flower buds, which prevent flowers from opening or cause petals to fall prematurely. In addition, adults will consume entire rose petals, and feed on the pollen of fully-opened flowers.

The management of Japanese beetle adults involves implementing a variety of cultural, physical, and chemical strategies.

Cultural: maintaining healthy roses through proper irrigation, fertility, mulching, and pruning is important in minimizing any type of "stress": which may decrease susceptibility. Also, removing weeds such as smartweed (*Polygonum* spp.) that are attractive to Japanese beetle will at least alleviate infestations of adults.

Physical: Japanese beetle adults may be removed from roses by hand-picking or collecting prior to populations becoming extensive. The appropriate time to hand-pick or collect adult beetles is in the morning when ambient air temperatures are typically "cool." 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. When adults are disturbed, they will fold their legs perpendicular to the body, and fall into the liquid and be killed. This procedure, when conducted daily or every-other-day, particularly after adults emerge, may significantly reduce plant damage. The use of Japanese beetle traps is not recommended since the floral lure and synthetically-derived sex pheromone tend to attract more adult beetles into an area than would "normally" occur. In addition, adult beetles may feed on roses before reaching the traps, which increases potential damage.

Chemical: contact insecticides are commonly used to kill Japanese beetle adults, and repeat applications are required; especially when populations are excessive. 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 may be used to suppress populations of Japanese beetle adults. However, since most of these types of insecticides are harmful to many natural enemies (parasitoids and predators) their continual use may lead to secondary pest outbreaks (such as twospotted spider mite). Systemic insecticides, in general, are less effective because Japanese beetle adults have to feed on leaves and consume lethal concentrations of the active ingredient. If extensive populations are present then this may still result in damage to rose plants.

So, not much has changed over the past 20 years in regards to managing Japanese beetle adults on roses. Therefore, diligence is required in order to prevent adults from causing substantial damage to roses…and still make growing roses a favorite past-time.

Raymond Cloyd

Webworms

Recently, webworms have been prevalent in southwestern Kansas in double cropped and late planted soybeans. In Kansas, these moths can have multiple generations per year, with the bulk of the damage to soybeans occurring in July and August. Scout these soybean fields often, as these caterpillars can defoliate a young soybean crop in just a few days. There are two species; the garden webworm and the alfalfa webworm that can attack soybeans. Pigweeds are one of the preferred foods of the garden webworm. When these weeds are sprayed with herbicide, the larvae move in mass to their secondary host, soybeans. The alfalfa webworms will migrate from alfalfa after it has been harvested. High numbers of these moths have been seen flying in alfalfa fields recently, but harvesting the alfalfa will eliminate eggs the moths may have laid.

Garden webworm on pigweed.

Early instar webworm in a folded soybean seedling leaf.

The garden webworm, *Achyra rantalis*. Webworms will line their feeding site with silk, often tying one or more leaves together.

Webworm feeding damage in soybeans can be recognized by the “window pane” leaves, frass and silk which create a messy, clumped look to the young soybean plant.

The garden webworm (left) can be easily distinguished from the green cloverworm (right) by its appearance and damage. (Cloverworm image by Iowa State Univ.)

The webworm has three spots in a triangle formation on each segment and four abdominal prolegs, while the green cloverworm has no spots and has three abdominal prolegs. The green cloverworm chews irregular holes in the leaves and will not clump leaves together with silk. Both of these larvae can act erratically when disturbed.

For control options in soybeans:

http://entomology.k-state.edu/extension/insect-information/crop-pests/soybeans/webworms.html

Green cloverworm:

http://entomology.k-state.edu/extension/insect-information/crop-pests/soybeans/gcw.html

Sarah Zukoff – Southwest Research and Extension Center

Volunteer Wheat

Volunteer wheat has germinated like crazy in every wheat field in central KS that has received rain in the last week or two. Some of these fields look like lush lawns with this flush of volunteer (See photo)h. More rain is predicted for the next week so this is going to continue. This sets up an ideal situation for many of our wheat pests. All of these, both insects and pathogens, utilize this "green bridge" as a host until wheat planting produces germinating plants that they will move into from the volunteer this fall. This includes Hessian flies, wheat curl mites (which, by the way, we saw considerable infestations from with subsequent wheat streak

mosaic infections, into central KS), the wheat aphids (greenbugs/bird cherry oat/English Grain), Brown wheat mites, false wireworms, etc. Remember, one of the best management tools to avoid significant infestations from these pests is to make sure volunteer wheat destruction occurs at least two weeks prior to planting/germination this fall.

Jeff Whitworth *Holly Davis*

Heerwirmer? Heerwürmer? Huh? A Lesson in German, and a Strange Event.

Thanks to CEA ANR Jenni Carr (Harper County), we are about to open a can-of-worms (groan, a horrible pun as you will soon find out when you read on). Jenni called with regard to a client's query about a "snakey looking" something on her driveway (maybe it was her sidewalk). As we visited, somewhere in the deep recesses of my memory bank came crawling out (double groan) something that I once addressed.

The word **Heerwirmer** is an original European term. Tina Jancke (Graduate Student in our Entomology Department) provided the following translation: **Heer** basically means army. However, **wirmer** was not German. But the close sounding word **würmer** (translated into German) basically means worms. Thus roughly translated, **Heerwürmer** means armyworms.
Yet, **Heerwürmer** are a far cry from what we (here in the United States) recognize as armyworms: large movements of various lepidopteran larvae.

What Jenni described in Harper County have been referred to (elsewhere) as: ropes of maggots; strings of maggots; parade of maggots; snake-like things; snake-worms; white worms; gross slithering masses; strange crawling objects; compound larvae. The "worms" (maggots) are the immature stages of what eventually become darkwing fungus gnats.

Photo Credit: entoweb.OSU.edu

"Darkwinged fungus gnats" are placed in the taxonomic order **Diptera** (two-winged insects), and more specifically the taxonomic family **Sciaridae**, which contains 60+ species in the taxonomic genus ***Bradysia*.** In nature, darkwinged fungus gnats are considered beneficial in their roles as decomposers. They are associated with moist conditions and are abundant in soil, leaf litter and rotting wood. The flies usually are inconspicuous due to their small size (3 mm or 1/8-inch). Flies live-to-breed. Rather, it is their slender legless larval/maggot stages which function as decomposers. White/cream in color, they possess a distinct black head capsule. Being semitransparent, one can observe the darkened digestive tract within. When mature, maggots measure 6mm (1/4-inch) in length

In certain situations, fungus gnats have pest status. There are numerous citations which go into detail with regard to the bionomics of darkwinged fungus gnats as well as management considerations. Visit Dr. Cloyd's Kansas State University Extension Publication MF-2937 Fungus Gnats: Management in Greenhouses and Nurseries, which is electronically available.

BUT BACK TO **Heerwürmer.** Usually fungus gnat larvae are independent of one another during their development and subsequent pupation. Yet, aggregations and mass movements of fungus gnat maggot hordes are sometimes encountered. This is not a new phenomenon. C. T. Brues (in his 1951 article, "A Migrating Army of Sciarid Larvae in the Philippines") cites American entomologist Townend Glover (February 20, 1813 – September 7, 1883) as the first to report migrating sciarids in the United States in 1872.

Various descriptions have been given as to the size of migrating masses. The mass to the right measures ~3-inches in length and ¼-inch wide. Reports by others: 15-20 inches; a foot long, ½ inch wide and ½ inch deep but constantly swelling and contracting; a foot or 2 in length with a diameter of ½ - 2 inches; 5-feet long, 2-inches in diameter.

Seen close up, individual maggots, their black head capsules and digestive tracts are easily discerned.

Being unpredictable in occurrence and seldom encountered, there has been little justification to conduct any depth studies to explain this curious phenomenon. Most remarks are anecdotal observational comments. In one instance, a 4-inch section from a foot long mass was comprised of 900-1200 maggots. The direction of movement was towards drier ground. The masses usually appear after rainfall events. Because the maggots are large/mature, it is assumed that they were not in search of food. There did not appear to be any special site at which they gathered and came from. They are observed in areas of rich, organic soils with heavy thatch. They moved at about an inch per minute.

Lacking legs/appendages, how to the "maggot lines" move? Perhaps the word slither is appropriate. But whereas an individual snake or slug may slither as a single entity (and the head is always "in front"), fungus gnat masses contain many many many individuals. Slithery implies slipperiness. And fungus gnat masses are slippery. Their columns advance in a unique way. As best described: Individual larvae move forward over the slimy bodies of larvae in front of them so that the progression is accomplished by that forward motion of those on top, while those at the rear of the procession become uncovered. The newly uncovered larvae then progress forward by moving over the over the cramped larvae in front of them, thus advancing to the head of the procession. This is a repetitious process which advances the movement of the maggots forward. This movement can best be seen by visiting www.youtube.com/watch?v=jL1JvKyd7uA

Additional short video clips to view:

www.youtube.com/watch?v=aC9iqtOm2x4

http://www.youtube.com/watch?v=bDpUayCHVXI

http://myfox8.com/2013/07/12/video-shows-strange-fungus-gnats-brought-out-by-recent-rain/

Bob Bauernfeind

Insect Diagnostic Laboratory Report

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

Eva Zurek

Sincerely,

Robert J. Bauernfeind
Extension Specialist
Horticultural Entomology
phone: 785/532-4752
e-mail: rbauernf@ksu.edu

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

Jeff Whitworth
Extension Specialist
Field Crops
phone: 785/532-5656
e-mail: jwhitwor@ksu.edu

Holly Davis
Research Associate
Phone: (785) 532-4739
e-mail: holly3@ksu.edu

Sarah Zukoff
Assistant Professor/Extension Entomologist
Kansas State University
Southwest Research and Extension Center
4500 East Mary St.
Garden City, Kansas 67846
Phone: 620-275-9164
Fax: 620-276-6028
Cell: 620-290- 1111
email: snzukoff@ksu.edu

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

KANSAS STATE UNIVERSITY | Department of Entomology