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

August 30, 2013 No 21

Wheat Aphid Sampling for Barley Yellow Dwarf Viruses

A team of KSU Entomologists and Agronomists led by Dr. Mike Smith, in cooperation with selected County Extension Agents, Area Agronomy Specialists, consultants, and producers, initiated a project in late fall 2012, in an attempt to determine the proportion of the population of wheat aphids throughout the state that carry a virus that causes the wheat disease Barley Yellow Dwarf (BYD). This three-year project is being funded by a grant from the Kansas Wheat Commission.

A brief background about this wheat disease. Barley Yellow Dwarf is the name given to the disease which can be caused by several different viruses. The disease may cause serious problems in wheat, to include death, especially if the young plants are infected in the fall. Spring infections are usually not as detrimental. In either instance, the virus must be transmitted to the plant through the saliva of an infected aphid. Many different species of aphids may vector BYD, but in Kansas, it is most commonly attributed to Bird Cherry-Oat Aphids or Greenbugs, our two most common wheat aphids. Both aphid species over-summer in grasses including corn, sorghum, and volunteer wheat. Aphids do also migrate into the state from southern states in fall, late winter, and spring. These aphids suck juice from plants and, under stressful growing conditions, can be detrimental just due to their feeding. However, this is rare in Kansas, because lady beetles and parasitic wasps usually control aphid populations before they stress wheat plants. Aphid problems come mainly from their ability to transmit BYD, and it only takes one infected aphid to transmit BYD to the plant.

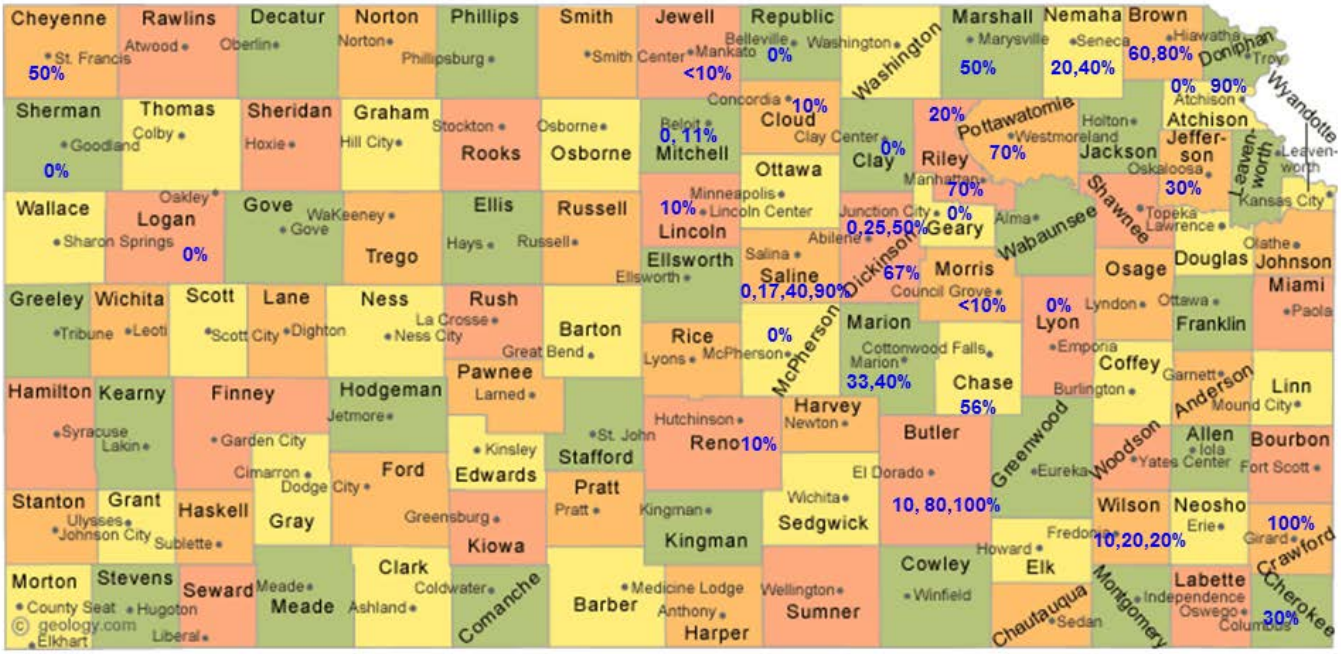
Aphids become infected with the virus by feeding on an infected plant. BYD viruses have no known effect on aphids. Once the aphid is infected, she becomes a carrier and then can potentially infect other plants that she feeds on. Infected plants then become the reservoir and other aphids feeding on those plants can become infected. BYD spreads from there, to infect more plants and more aphids, etc., until the disease has become a significant problem. So, Dr. Smith's team wanted to sample aphid populations from around the state to get an idea of what percent of the aphid populations have the potential to vector BYD into Kansas wheat.

Thus, laboratory procedures were developed to determine if aphids are infected with a BYD virus. This was not easy, and resulted from some trial and error, but the technique has now been tested and is sensitive enough to detect virus from individual aphids. Procedures then had to be established to collect aphids and get them from the fields to the lab while still alive, because the virus degrades too much to be detected in dead aphids.

All of the samples collected during the Spring of 2013 have now been tested and the first results from Dr. Smith's team are presented on the attached map. The blue numbers represent samples collected as assayed from each of those counties, and are the percent of the sample of aphids that are infected with BYD virus. For instance, Saline Co. has numbers 0, 17, 40, 90%. This means one sample had no virus, one sample had 17%

infected aphids, another sample had 40% infected aphids and the last sample had 90% infected aphids. Since techniques and procedures have now been developed and tested, interested wheat cooperators can now submit samples of live wheat aphids to determine if they are carriers of BYD in different areas of the state. This program will hopefully be expanded so many more aphids will be assayed to determine the potential for Barley Yellow Dwarf Virus all around the state.

Samples of wheat aphids determined positive for Barley Yellow Dwarf (BYD)



Jeff Whitworth C. Mike Smith Holly Davis

Jeff Whitworth Holly Davis

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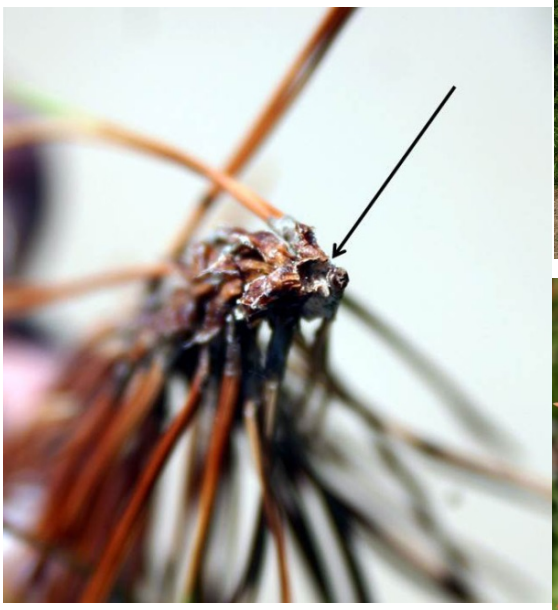
Return of the Nantucket Pine Tip Moth (NPTM)

A brief recap – – – From 1993 through 2007, NPTM was of little personal concern. But in August, 2008, one of my 2 Mugo pines was heavily hit. Using a pheromone trap in 2009, I was able to "note" the first wave of NPTM activity. So alerted, I applied an insecticide treatment. It must have been effective as no further moths were trapped in 2009. Nor were any trapped in and through 2010. Thus satisfied that I had eradicated NPTM at 2110 Londondery Drive, I dispensed with pheromone traps in 2011, 2012 and this year.

And you know (by now) that NPTM have reappeared. From where they came? And again, why on one Mugo but not the other but 20-feet away? There is little to be done at this point other than (if not aesthetically acceptable) removing the hollowed out "browned/reddened" tips. However, I can live with them to remind me that in 2014, I will need to use a pheromone trap to alert me, "It's time to treat!".



Return of Fall Webworms (FWW)

After a year's absence (in 2012), I recently noted fall webworms. It is not that fall webworm actually disappeared last year. As is typical with insects, there are extremes in yearly occurrence. Fall webworms have been a regular feature in the Kansas Insect Newsletter between 2003 and 2011. Last year was the first year that they were not a topic included in the newsletter. While FWW were not swept-from-existence, several people also made comment that they had not observed FWW in 2012 ----- these from areas traditionally with a lot of FWW/webbing activities.

Earlier this week, I did a "WHOA!" when driving to work. Why I had not seen this earlier I cannot explain. Maybe my eyes were more on the road. Or maybe it was the time of day and the position of the sun causing a glistening that caught my eye. Whatever, there they were!

Judging by the size of the web mass as well as the caterpillars contained within, I gauged this colony to be 5 weeks old thus taking them back to mid-July. While that would have been a bit late for the initiation of first generation redheaded race fall webworm, recalling the cooler-than-normal Spring may help explain the delay in their appearance. Of interest: these FWW were feeding on honeysuckle. Not that this is unprecedented, but it is the first time that I have encountered them on honeysuckle (as identified by Dr. Cloyd).

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Spiders, Webbing and Victims

A “softie-at-heart”, nothing hurts more than watching an individual gleefully stepping on a spider. I understand that many arachnophobes may have been taught to live-in-fear of spiders. This is unfortunate because spiders are fascinating creatures ---- fun to watch. Additionally, there are beneficial aspects to their existence.

A common statement related to spiders is, “Spiders are poisonous”. In fact, spiders are not poison – which by definition is a substance that through its chemical action usually kills, injures or impairs an organism. A more accurate statement would be, “Spiders are venomous”. This is true, in that spiders do produce venom – a substance used to paralyze/still a prey. Utilizing their fangs, venom is delivered via a spider’s bite.

Contrary to the false impression that, “Spiders are out to attack me”, spiders are shy creatures tending to remain secluded/hidden. Furthermore, due to their small size and/or delicate physique, it is questionable whether (in most instances) their fangs are capable of piercing our skin. But if they do so, the amount of venom delivered is (most likely) minimal ---- insufficient to cause an adverse reaction. Larger spiders have a greater capability of effectively biting, but are not inclined to do so unless provoked or forced into a defensive mode.

So why discuss spiders now? We are at that time of year that spiders are becoming more evident. While spiderlings have been secretively feeding/growing/maturing throughout the summer (and webs were small and unobserved), now is when fully-grown females construct “noticeable” webs. Webs seemingly occur anywhere and everywhere. In bushes, lawns, gardens. Under eaves and other nooks and crannies of homes and buildings. Already I have received phone calls asking what to do about spider webs. I try to make people understand that there is no reason to do anything about webs. Let them be. But if people object to their mere presence, individual webs can simply and easily be removed.

Back to my Junipers and Mugos. Plenty of webbing to be seen.

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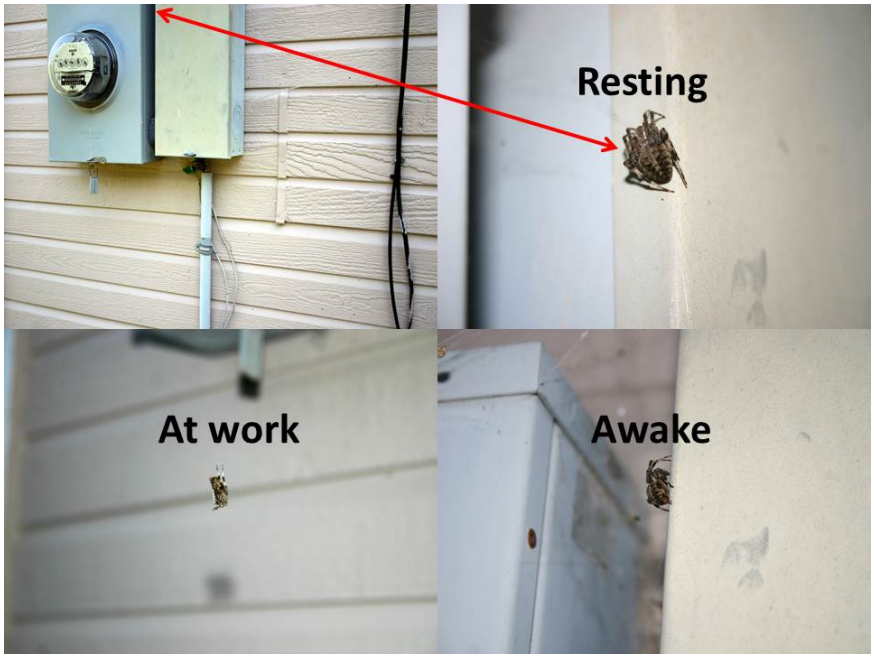
These webs are those of **funnel weavers**. The spiders themselves are secreted away in a tubular portion of their web where they await the arrival of a visitor. Vibrations sensed by the spider cause her to react by rushing out to capture her prey. You can bait a web and watch the action.

Similar "sheets" of webbing are also made by **sheetweb weavers**. These spiders wait beneath the webbing and bite their victims from below, after which they are pulled through the sheet where they are then consumed.

A third category of spiders (**orb_weavers**) produce beautiful symmetric webs designed to ensnare intruders which (by chance) happen by. There are many species of orb weavers. No one description fits all. Some construct temporary webs as the sun sets but take the web down with the approach of sunrise. This is their daily routine. Others orb weavers construct permanent webs which may require repairs from time to time.

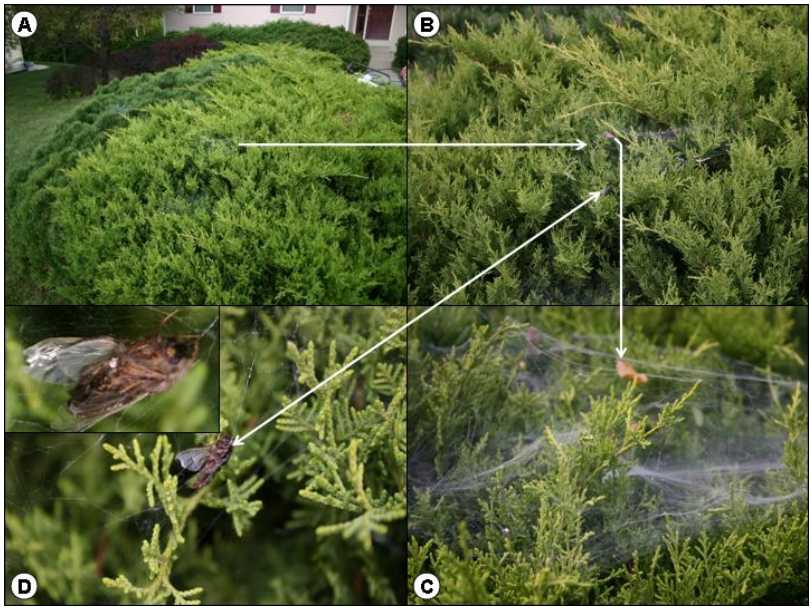
Depending on the species, some orb weavers hide by day. If you encounter an in-tact orb web during daylight hours, the web's owner usually can be located nearby, perhaps in a curled up leaf or in some out-of-way concealed location. Or, if you know where an orb weaver has its "nightly web", during the day, you can find her "snoozing away" as she awaits night's return.



Others (such as the golden garden spider) do not hide during the day. Rather, they are continually present, positioning themselves head-down in the central hub of their web. This offers ample opportunity for people/kids to "interact" with them. Especially interesting is the speed with which a spider detects and instantly moves towards her prey, and the dexterity and speed with which she enwraps her catch. She will then feed at her leisure. When no longer of food value ("sucked dry"), she will cut loose her depleted prey to then simply drop to the ground.

Webbing spiders are opportunistic generalist feeders. Whatever blunders into a web becomes a meal. If the victim happens to be regarded as a pest species such as the ensnared grasshopper (above) or a male bagworm moth (to the right), we think,

"GREAT!"



But if the captured insect is (in of itself) considered a beneficial insect (a praying mantid), we utter,

"Awww. Geez."

But again, spiders are opportunists regardless of how we might view their victims.

The capture/demise of individual insect pests might be used by some individuals as evidence/proof to point to and express, "See? Spiders are important for biological control!" While hypothetical calculations have been used to extoll the benefits of spiders as biological control entities, in truth, such expectations likely are unrealistic. Again, because spiders are indiscriminate feeders, they are not "pest specialists". Additionally, not being socially adept (rather, viewing any neighboring kin as "food"), spider populations are not sufficiently dense to accomplish meaningful biological control of insect species deemed "pests". This being said, allow them their existence and space. Simply, respect them for their beauty and fascinating habits.

Bob Bauernfeind

Soybean Insects

Sampling soybean fields in central KS revealed very few insect pests-yet. A few green cloverworms of various sizes (see picture) a few thistle caterpillars (painted lady) (see picture), some woolly bear caterpillars, some webworms, and a few bean leaf beetles. Really, pretty quiet so far, but many fields are in the R1-R3 stage and are still vulnerable to corn earworms (soybean podworms), so monitoring should continue for the next couple of weeks.

Green Cloverworm Larvae

Greenbugs in sorghum

Cool midsummer weather is ideal for aphids that are normally supressed by our hot, windy weather in central Kansas at this time of year. Some of you may have noticed that the appearance of many seasonal insects is 2-3 weeks late this year. Greenbugs normally infest sorghum soon after canopy closure, just prior to panicle emergence, but this year they are late too. As the sorghum plant enters reproductive stages, leaves cease to grow and flowers become the only suitable feeding site for aphids. Under 'normal' (= hot) conditions, flower feeding is rare because the aphids cannot stand the heat of exposure high up on the panicle. However, several weeks of relatively cool, cloudy weather has resulted in flower feeding by greenbugs in some sorghum fields this year. The aphids are long gone in these pictures (Photo 1) but note the reddish discoloration lower down on the stalk (Photo 2) - clear evidence of earlier greenbug feeding. The result is greenbug-induced flower sterility and heads that failed to fill grain (Photo 3).

Photo 1

Photo 2

Photo 3

J.P. Michaud – Agricultural Research Center – Hays, KS

Insect Diagnostic Lab 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

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

J. P. Michaud
Integrated Pest Management - Entomology
Agricultural Research Center - Hays, KS
Phone: (785) 625-3425
e-mail: jpmi@ksu.edu

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