# Kansas Insect Newsletter

For Agribusinesses, Applicators, Consultants and Extension Personnel



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## Bagworms

Well, it is that time of year, which you have been nervously anticipating—dealing with that insect pest called the bagworm, *Thyridopteryx ephemeraeformis*. Yes, bagworms are here!! However, I tend to have a more positive attitude regarding bagworms and think that bagworms give trees and shrubs a "special appeal" since they make them look like Christmas trees.

Newly hatched caterpillars (larval stage) are very difficult to detect because they tend to blend in with plant foliage. In addition, although we won't admit it, as we get older (or more mature) our eyesight tends to diminish, which also makes it difficult to detect small bagworms. In the spring, caterpillars climb to the tops of trees and "hang-out" on one to three foot strands of silk. These strands are eventually caught on wind currents and detach, becoming streamers that allow the caterpillars to remain aloft for hundreds of feet to several miles, depending on wind speed (or velocity) and the occurrence of up-drafts. This process is referred to as "ballooning." The caterpillars float through the air until the silk catches onto a plant or other object. It is important to note that caterpillars can "balloon" from nearby or even distant plants (e.g. trees). In general, young caterpillars are small and cause only minimal damage to foliage; feeding on the epidermal and mesophyll layers, which create light areas on leaves. It is typically recommended to avoid applying any insecticide for at least two weeks after egg hatch to allow adequate time for the caterpillars to complete the "ballooning" process, settle down, and initiate feeding. An insecticide application during this time maximizes regulation of bagworms resulting in higher mortality levels. A second application is usually required a week or two later.

A female bagworm still hanging on a tree from last year may contain between 500 to 1,000 eggs. In general, newly hatched caterpillars emerge from the bottom of the bags from late May through early June. Each caterpillar creates a small silk bag, or case, covered with material from the host plant fed upon. Caterpillars remain in the bag for the remainder of their life. Young (or early instar) caterpillars are 1/8 to 1/4 inches in length and initially feed on the epidermal tissue on one side and the mesophyll layer, which may cause leaves to appear white before turning brown. Young caterpillars typically initiate feeding at the top of trees and shrubs.

The older or more mature caterpillars are 3/4 to 1.0 inch long and consume entire needles or leaves, primarily on branches at the top of the tree or shrub. As the caterpillars mature, and the nutrient quality of the host plant declines, they migrate downward, feeding on lower leaves. Entire branches of conifers may die if stripped of foliage by the caterpillars. A severe bagworm infestation can completely defoliate a tree or shrub, which may result in death of branches or the entire plant. This is especially the case with evergreens, which don't normally produce a flush of new growth following defoliation by bagworms. In contrast,

deciduous trees and shrubs will usually produce new growth and are thus able to survive an infestation of bagworms. Bagworm caterpillars, in general, feed for approximately three months. On certain host plant species, female bags are located at the top, whereas male bags are distributed near the bottom of the plant canopy. This arrangement allows the females to effectively disperse pheromones that attract the winged males and increases the possibility for mating and fertilization of eggs ("Sex in the Tree," as opposed to "Sex in the City").

In late summer (around mid- to late August and sometimes into early September), caterpillars develop into a pupal stage inside the bags. Bagworms take about seven to 10 days to change from a pupa to adult; however, this depends on temperature. The males, which are black moths with clear wings, emerge through the bottom of the bag and disperse to mate with females. Females never develop into adult moths because they lack eyes, legs, antennae, and wings. As such, the females remain inside the bag, producing eggs before dying. The eggs are the overwintering stage and there is one generation per year in Kansas.

If feasible, hand-picking and destroying bags from fall through mid-spring is very effective in removing the overwintering eggs before they hatch. The bags can be placed into a plastic container with soapy water or into a sealed Ziploc bag and then disposed of. We don't recommend placing the bags into a container filled with kerosene and then lighting it!

A number of insecticides labeled for regulation of bagworms include *Bacillus thuringiensis* subsp. *kurstaki* (Dipel), cyfluthrin (Tempo), trichlorfon (Dylox), indoxacarb (Provaunt), chlorantraniliprole (Acelepryn), and spinosad (Conserve). Some of these active ingredients are often available and sold under different trade names. Furthermore, several of these materials may not be available to homeowners. Insecticide applications are most effective on the young caterpillars. Older caterpillars in the bags may be 3/4 inch long and are more difficult to control or obtain sufficient mortality. Furthermore, females tend to feed less as they prepare for reproduction, which reduces their susceptibility to insecticide sprays and any residues. The bacterium *Bacillus thuringiensis* is highly active on young caterpillars; however, the material must be ingested to be effective, so thorough coverage of all plant parts is essential. Spinosad (Conserve) works by contact and ingestion, and is extremely effective in regulating bagworms. Cyfluthrin (Tempo), trichlorfon (Dylox), and indoxacarb (Provaunt) are typically used against the larger caterpillars. Again, thorough coverage of all plant parts is essential, especially the tops of trees and shrubs, where bagworms commonly initiate feeding. As mentioned previously, insecticides should be applied approximately two weeks after egg hatch. This allows the caterpillars to complete the ballooning process. If insecticides are applied too early, then a second and third application may be required. Scouting trees and shrubs two weeks after applying an insecticide will be helpful in determining if additional bagworms have blown in and also allow you to evaluate the effectiveness of insecticide applications.

*Raymond Cloyd*

## Twospotted Spider Mite

The warm weather that we are experiencing throughout the state of Kansas and will experience later on means it is time to be cognizant of the potential damage caused by the twospotted spider mite, *Tetranychus urticae*. Twospotted spider mite is considered a warm-weather mite because, in general, populations are primarily active from late spring through early fall. Summer temperatures allow twospotted spider mites to reproduce rapidly, so that they overwhelm natural enemy populations, which under "moderate" temperatures are able to regulate them.

Twospotted spider mite has a very broad host range, feeding on a diversity of ornamental trees and shrubs including ash, azalea, black locust, elm, euonymus, maple, oak, poplar, redbud, and rose. Twospotted spider mite will also feed on many herbaceous annuals and perennials such as marigold, pansy, aquilegia, buddleia, clematis, daylily, delphinium, phlox, rudbeckia, salvia, Shasta daisy, and verbena.

Twospotted spider mite adults are oval and approximately 1/16 inch long. They vary in color from green-yellow to red-orange. Adults possess two lateral dark spots that are visible when the spider mite is viewed from above (hence the common name). Both adults and nymphs may be present on plant parts; however, they are often more numerous on older leaves. Populations of twospotted spider mite produce fine silk, which may be seen between leaves, and the petiole and stem. Webbing produced by twospotted spider mites protects them from natural predators. Heavy rainfall may disrupt and remove the webbing.

Twospotted spider mites feed on leaf undersides, removing chlorophyll (the green pigment) from individual plant cells with their stylet-like mouthparts. They feed near the leaf midrib and veins because this is where the highest concentrations of amino acids are located. Leaves are stippled in appearance, with silvery gray to yellow speckles. Heavily-infested leaves appear bronzed, turn brown, and eventually fall off. The warm and dry conditions of summer favor rapid development of twospotted spider mite populations, in addition to enhancing feeding and reproduction. The life cycle from egg to adult occurs within 5 days at temperatures >75ºF. Twospotted spider mite females don't have to mate to reproduce laying up to 300 eggs during their two to four-week lifespan.

The management of twospotted spider mite populations involves sustaining plant health, implementing sanitation practices, and/or using pest control materials with miticidal activity (miticides). First of all, it is important to avoid exposing plants to any type of "stress" by maintaining proper watering, fertility, and mulching since this may reduce any potential problems associated with twospotted spider mite populations. For example, inadequate moisture or overfertilizing plants, particularly with nitrogen-based fertilizers, may enhance development and reproduction of twospotted spider mites. It is always best to monitor for twospotted spider mite populations by knocking the spider mites off plant parts such as branches or twigs onto a white sheet of paper. This allows you to easily observe the spider mites. Plant-feeding spider mites typically leave a green streak when crushed whereas predatory mites leave a red streak. A very effective and rapid method to deal with twospotted spider mite populations is too apply a hard water spray throughout the plant canopy. This will dislodge eggs and the motile life stages (larvae, nymphs, and adults), and also preserves any natural enemies. The removal of plant debris and weeds eliminates overwintering sites. In addition, many broadleaf and grassy weeds are hosts for twospotted spider mites.

Pest control materials with miticidal activity recommended for regulation of twospotted spider mite populations outdoors include abamectin (Avid), acequincyl (Shuttle), bifenazate (Floramite), etoxazole (TetraSan), hexythiazox (Hexygon), potassium salts of fatty acids (Insecticidal Soap), and paraffinic or petroleum-based oil (horticultural or summer oil). Be sure to read the label and make applications before twospotted spider mite populations are extensive and causing aesthetic injury. Many pest control materials used to control other insects such as plant-feeding beetles and caterpillars may be harmful to the natural enemies of twospotted spider mite, which may lead to an inadvertent increase in twospotted spider mite populations.

*Raymond Cloyd*

## The YoYo Tree …… Effect of Defoliations

Not to be confused with famed cellist Yo-Yo Ma, or "The Hanging Tree" written and performed by Marty Robbins, the YoYo tree is a walnut tree that has been observed over time. In September, 2007, the tree was defoliated by walnut caterpillars (Figure 1)


Figure 1

Was the tree killed? Obviously not as evidenced by its appearance in June, 2008 (Figure 2).

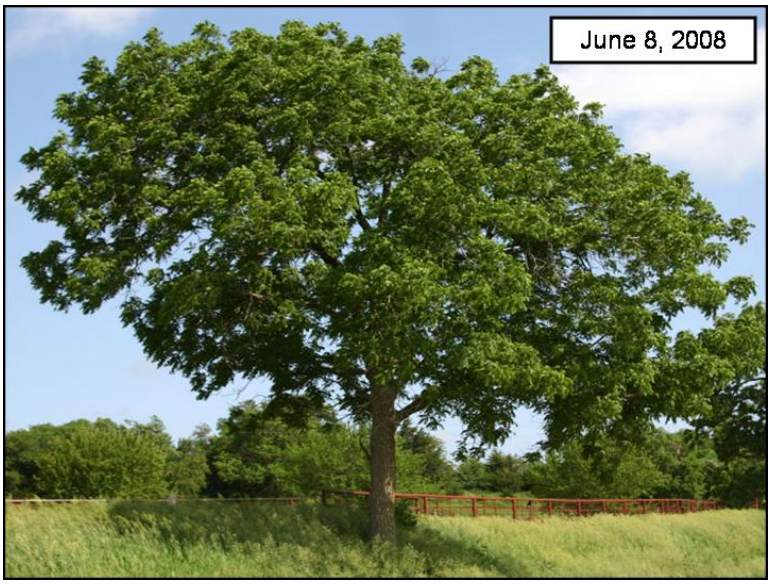



Figure 2

But by the end of July, the first generation of walnut caterpillars again caused extensive defoliation (Figure 3).

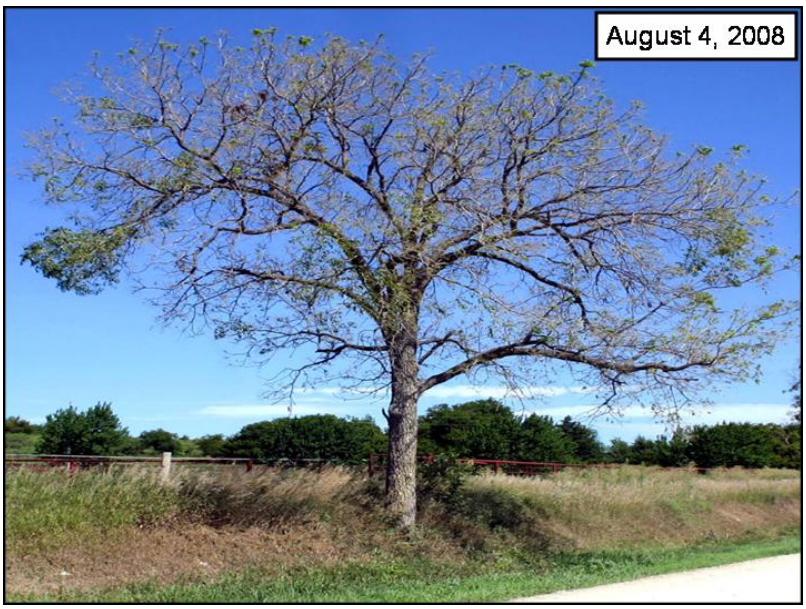



Figure 3

However, because this defoliation occurred early enough in the season, the tree put out a flush of new leaves, and its appearance was soon restored, albeit a bit more sparse (Figure 4).

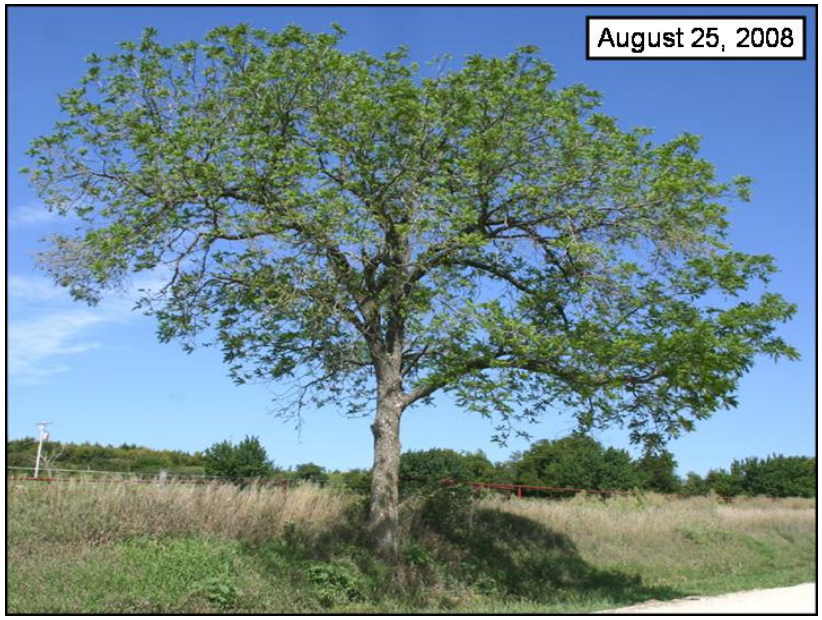



Figure 4

Because the second generation of walnut caterpillars was greatly diminished, the tree ended the season with little additional leaf loss (other than the typical leaf drop at season's end).

Currently the Yo Yo tree appears in its full splendor (Figure 5).


Figure 5

The purpose of this series of images is just to help alleviate the concerns of people who have trees that experience defoliations. The stark appearance of trees may be disconcerting and worrisome. Bear in mind, however, that the caterpillars consume "foliage" --- they do not feed on or damage bud tissues. **Mature** deciduous trees are very resilient and capable of moving beyond defoliations.

Note that "mature" is highlighted. This is to distinguish them from newly transplanted trees or trees not yet fully established which do require protection against defoliating pests until such time that they are able to stand-on-their-own.

*Bob Bauernfeind*

## "Worms" on Junipers

On occasion, people will inquire about "worms" feeding on their Junipers. The "worms" in this instance are the larvae of the Juniper sawfly (Figure 6).

Figure 6

These are considered but minor pests. Usually found in but low numbers, even when populations are high, their feeding damage is not extensive. And when larvae cease feeding and enter their pupal stage, unfettered regrowth of plant foliage rapidly erases any evidence of their past presence. If people choose to employ control tactics, both horticultural oils and horticultural soaps are very effective against these soft-bodied larvae.

**Aside:** There is sometimes confusion distinguishing the larva of sawfly (not truly "a fly" whose larvae are generally referred to as maggots) from the "caterpillar" larva of a butterfly or moth. Although similar they are easily separated on the basis prolegs (outgrowths of abdominal segments that act as legs) (Figure 7). Both have3 pairs of "true legs" on their thoracic segments.

Regarding prolegs: sawfly larvae have a pair on each abdominal segment whereas lepidopteran larvae have abdominal areas devoid of prolegs. Most often, sawfly larvae have a distinct pair of eyespots (darkened areas) on their head capsules ---- never so for lepidopteran larvae.

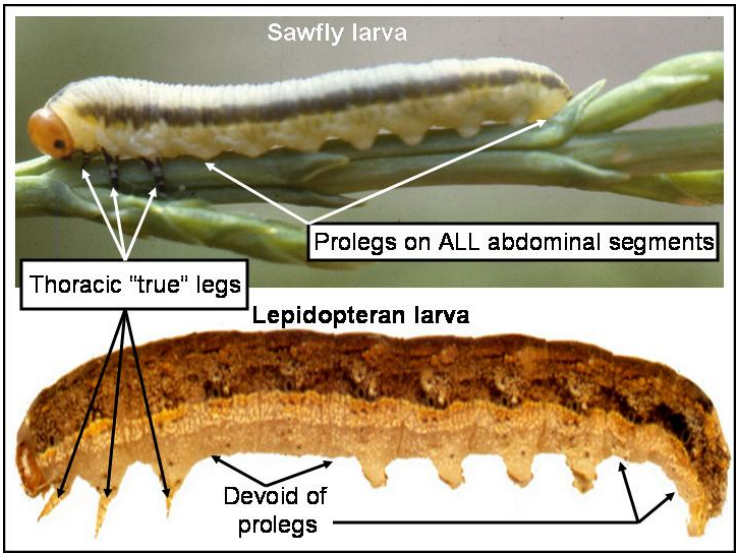



Figure 7

## "Spider"with red abdomen bites youngster ……..

It almost reads like a headline in a checkout counter tabloid. Of course, inquiring minds want to know ------ sooooo, the "spider" was not a spider, but rather the nymph of a wheel bug. To an untrained eye, possibly the spindly legs might give the illusion of a spider. But this creature obviously is an insect on the basis of its having but 6 legs (Figure 8).

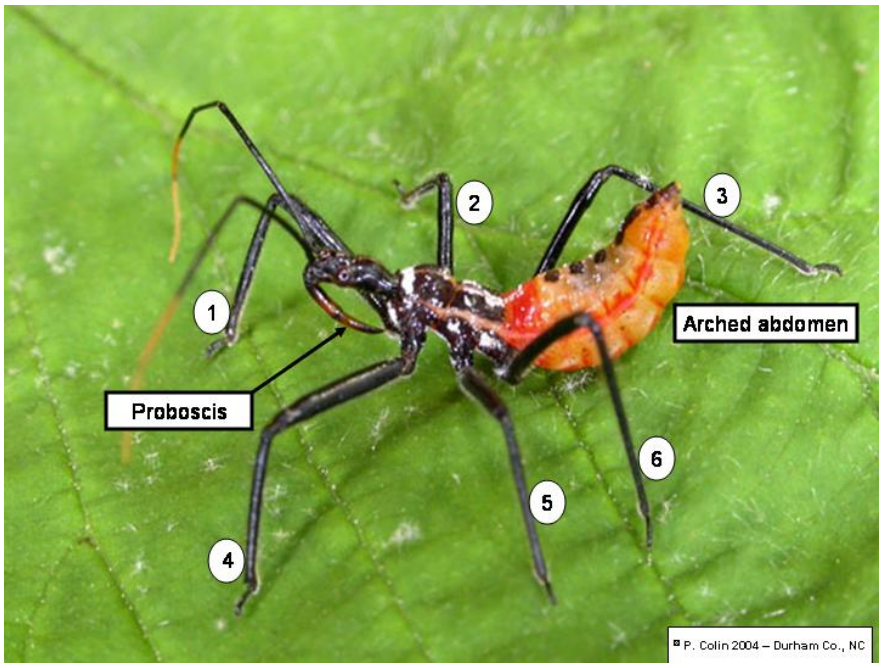



Figure 8

Assassin bugs are so named because of their habit of killing/slaying other insects. Longs legs (= speed) and a sharp/pointed proboscis enable these predators to overtake and feed on their prey. The wheel bug is the most highly recognizable member of the assassin bug family (Figure 9). In size, they may exceed and inch in length. Their prominent saw-like "crest" provides the basis for their common name.

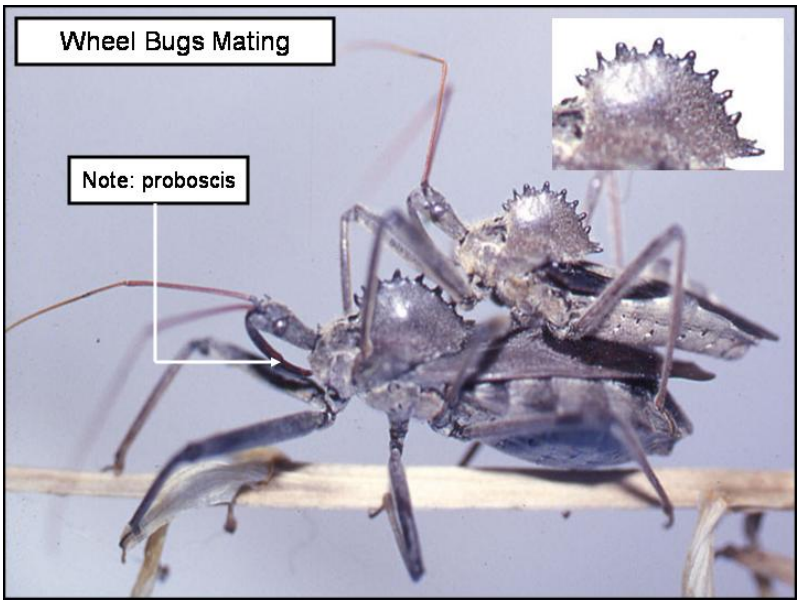


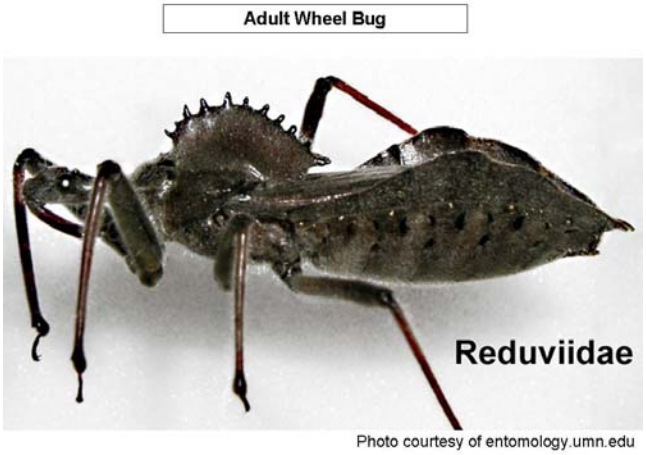

Figure 9

The BITE! Well, probably more aptly called, The Jab! When handling assassin bugs, they will give a quick poke, which in of itself, should not amount to more than a brief needle prick. Yet there is a lingering stinging sensation caused by the injected saliva of assassin bugs ---- the saliva contains a paralyzing agent to "still" the prey as the assassin bug imbibes its body fluids.

## Wheel Bug Nymphs – The Mystery Insects

The Insect Diagnostic Lab has received many samples, phone calls and e-mails about these little bugs in the last several weeks. People may become concerned when they find large masses of these little insects (approx. ¼ inch long) in their gardens, on trees, and even on outdoor structures such as sheds. However, there is no need for alarm as these do not pose a threat nor is it the beginning of an infestation. These are true bugs nymphs, or immatures, commonly called wheel bugs (Family Reduviidae). In the spring to early summer these bugs hatch from overwintering egg masses and the first few nymphal stages may remain clumped together but they will begin to disperse as they develop. From egg hatching to adulthood is reported to take about three months.

Wheel bugs are predatory on other insects, including many pest insects such as defoliating caterpillars, and therefore destroying them is not recommended. Please note that if handled and harassed, the nymphs and adults are capable of inflicting a painful bite as their salvia contains a toxic substance used to immobilize and kill prey.


Bob Bauernfeind Holly Davis

## Hessian Fly

Tom Maxwell, Saline Co. Extension Agent, reported wheat breaking over and lodging in Saline Co. on 10 June. Several plants were examined and had 1-3 Hessian fly "flax seeds" per plant.

Gary Cramer, Sedgwick Co. Extension Agent, reported adult Hessian fly activity, as indicated by pheromone traps, was significantly reduced from 500+ for the 28 May – 4 June sampling period to 5 for the 4 – 11 June sampling period.

If Hessian fly infestations are detected we would really appreciate a phone call or e-mail to either Holly or I so we can get the location and extent (if possible) of the infestation. We would like to visit several selected sites of infestation to collect Hessian flies and possibly to initiate some pheromone trapping at those locations.

Jeff Whitworth Holly Davis

## Potato Leafhoppers

A significant infestation of adult potato leafhoppers was noted in a Riley Co. alfalfa field on 10 June. These adults are and will be depositing eggs in plant tissue and the very tiny nymphs emerging soon. There were about as many adults in this field as I've ever seen, so as the nymphs start emerging this is just going to cause more stress to the alfalfa plants. The good news is that insecticides are very good in controlling these pests, but monitoring should start now and should include seedling soybeans as these may be affected by large populations of potato leafhoppers also. For sampling and treatment guidelines see our website at: http://www.entomology.ksu.edu/DesktopDefault.aspx?tabindex=181&tabid=514


Jeff Whitworth Holly Davis

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## Report from the Kansas State University Insect Diagnostic Laboratory:

The following samples were submitted to the Insect Diagnostician Laboratory from June 05th to June 11th

Not reported in last week:

June 02 2009 Dickinson County – Army cutworm moth

June 05 2009 Edwards County – Pine needle scales (dead) on scotch pine
June 08 2009 Decatur County – Assassin bug nymphs clustered on side of chicken house
June 08 2009 Decatur County – Assassin bug nymphs found in basement
June 08 2009 Jefferson County – Carpet beetle larvae in home
June 09 2009 Riley County – Northern widow spider under barbeque grill
June 09 2009 Bourbon County – Winged odorous house ants in home
June 10 2009 Chase County – Narrow searcher ground beetle under wood
June 11 2009 Decatur County – Scolytid beetles in cedar trees
June 11 2009 Saline County – Male Lone star tick on human

If there are any questions regarding these samples or about the identification of any arthropod please contact the Insect Diagnostician at (785) 532-4739 or GotBugs@ksu.edu.

*Holly Davis*

**Sincerely,**

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