Kansas Insect Newsletter

For Agribusinesses, Applicators, Consultants and Extension Personnel

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June 11, 2010 No. 12

Bagworms Are Here So Beware!!

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 out-and-about feeding on different trees and shrubs. So, what can you use to minimize the damage caused by bagworm caterpillars? Well, a number of insecticides labeled for control or suppression of bagworms include acephate (Orthene), *Bacillus thuringiensis* subsp. *kurstaki* (Dipel, Thuricide), 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 suppressing bagworm populations. 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.

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 on the look-out for 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.

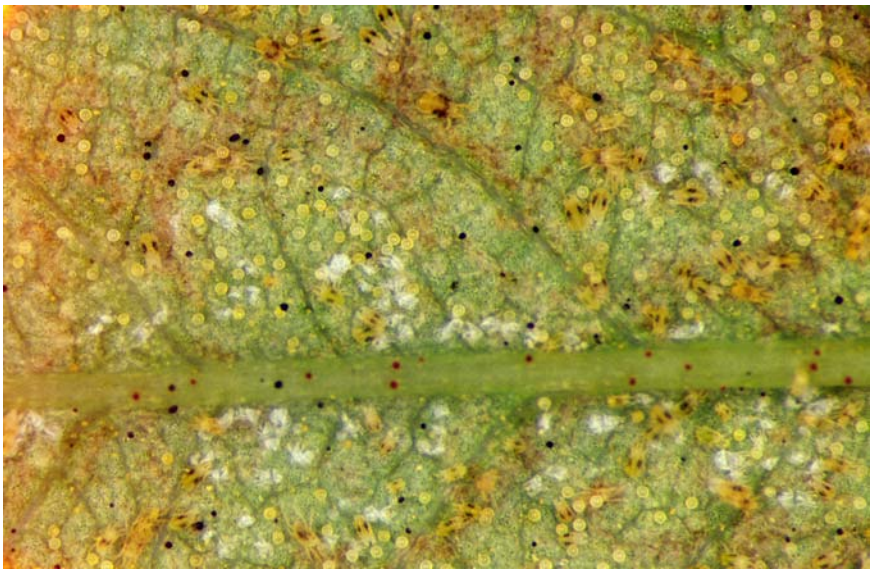
Twospotted spider mite has a very broad host range, feeding on a diversity of ornamental trees and shrubs including ash, azalea, black locust, elm, euonymus, maple, oak, poplar, redbud, and rose. Twospotted spider mite will also feed on many herbaceous annuals and perennials such as marigold, pansy, 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.

Twospotted spider mite management involves maintaining 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 are too apply a forceful 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 suppression of twospotted spider mite populations outdoors include abamectin (Avid), acequinocyl (Shuttle), bifenazate (Floramite), etoxazole (TetraSan), hexythiazox (Hexygon), potassium salts of fatty acids (Insecticidal Soap), and petroleum or paraffinic-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 suppress 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.



What Happened To My Honeysuckle Bush?

Honeysuckle aphid (*Hyadaphis tataricae*) or honeysuckle witches-broom aphid is one of the most destructive insect pests of bush-type honeysuckles and damage is quite apparent in landscapes during this time

of year. Aphids cause plant injury by injecting toxins or growth regulator-type substances with their saliva (spit) during the feeding process. The substances contained in the saliva stunt new growth causing twigs to branch into clusters called—"witches broom." Affected plants appear red-streaked, curled, with dwarfed leaves. This makes plants less aesthetically pleasing (although I personally think this enhances their aesthetic quality) in the landscape and infected branches may die during the winter. In general, feeding by honeysuckle aphid will not kill plants.

Honeysuckle aphids overwinter as eggs, which are laid during the fall in buds and/or on the tips of branches. Eggs hatch in spring, into wingless females, when the leaves on honeysuckle plants are expanding. Aphids that develop from eggs can give birth to live offspring (young) without mating (this is referred to as parthenogenesis). These aphids initiate feeding when leaves have fully-expanded. Honeysuckle aphids are 1/16 inch long, cream-colored and feed on new shoots on leaf undersides and in leaf folds. Aphids tend to remain in the folded leaves, which protect them from natural enemies and weather. There may be multiple generations during the summer with only winged females being produced; however, in early to mid-fall winged males and females may be present. Mated females lay their eggs on honeysuckle shrubs.

Honeysuckle aphid management includes the use of resistant varieties of honeysuckle, proper cultural practices, and use of insecticides. Honeysuckle varieties that have demonstrated to be tolerant of honeysuckle aphid are Arnold Red, Clavey's Dwarf, and Emerald Mound. There may also be newer varieties that exhibit tolerance to honeysuckle aphid. Appropriate watering and fertilization practices can also alleviate problems with this insect pest. For example, avoid over-watering and over-fertilizing plants, especially with nitrogen-based fertilizers, as this may prolong infestations by stimulating succulent shoot growth. It is important to prune out, at least 6.0 inches below the initial damage, any witches-broom growth before buds break so as to remove overwintering eggs. In addition to removing the unsightly witches-broom growth, pruning may reduce the severity of future outbreaks by eliminating a majority of the honeysuckle aphid population early in the season. However, any pruning that occurs after eggs hatch may lead to the production of new leaf growth that is highly susceptible to honeysuckle aphids thus resulting in extensive damage.

Systemic insecticides recommended to manage or suppress honeysuckle aphid populations include acephate (Orthene), imidacloprid (Merit and many generics), and dinotefuran (Safari). These insecticides should be applied in the spring when new leaves are expanding and before newly-hatched aphids initiate feeding. In addition, these insecticides may provide suppression of aphids within the leaf folds. Repeat applications may be warranted depending on the timing of application and extent of the infestation. Acephate may provide suppression for a month whereas imidacloprid and dinotefuran should give season long suppression. The benefit of using systemic insecticides is the long residual activity and preservation of natural enemies such as ladybird beetles that will prey upon the aphids in the leaf folds. Be sure to always read the label for instructions on how to properly apply systemic insecticides.

Raymond Cloyd

Garden Webworm in Soybeans

Dr. Doug Shupe, SE Area Agronomist, has reported webworms infesting soybeans in SE Kansas (see photos). This is not unusual, but worth noting due to the extent of the infestation last year. These moths started infesting fields in SE Kansas and then kept spreading west and north, affecting many fields throughout the eastern two-thirds of the state in 2009. Soybeans are very resilient and can tolerate considerable defoliation without affecting yield but some fields in 2009 were reduced to stems, but only in large patches. Therefore, this insect is worth watching to avoid infestations reaching this stage in 2010. There is no established treatment threshold but if there are 4 or more ½ inch webworms (and often there may be other larvae present contributing to the defoliation) it would probably justify treatment. Trails conducted in 2009 indicated most of the commercially available insecticides registered on soybeans for the other worms worked well. Please visit the Entomology website – Garden webworm trial 2009:
http://entomology.ksu.edu/DesktopDefault.aspx?tabindex=203&tabid=476

Jeff Whitworth *Holly Davis*

Summer of the 'hoppers?

Recent observations across the High Plains suggest that 2010 could be setting up as an outbreak year for grasshopper populations. Overwintering survival of eggs appears to have been very good and calls have come in about grasshopper concerns in Kansas alfalfa fields, even though most species are still in relatively early instars. Densities of up to 50 nymphs per square yard are being reported from hay fields and pastures in Wyoming, Montana and the Dakotas. Some species such as *Melanoplus sanguinipes* will become gregarious at such high densities and can swarm and migrate hundreds of miles in search of food.

Migratory grasshopper, *Melanoplus sanguinipes*

Grasshoppers continue to be one of the most destructive pests of rangeland grasses in the western US. Hopper populations are only limited in nature by one of three things: weather (both direct and indirect effects), natural enemies (mostly predators and diseases), or food availability (we're in trouble when it comes down to this). The only important predators are birds and small mammals and these cannot increase in numbers rapidly in response to grasshopper outbreaks.

Keep in mind that hopper densities of only 4 per square foot can result in forage losses of 600 lbs per acre over an entire growing season. If a decision is made to apply chemical controls, these must be applied while grasshoppers are still in early juvenile stages. Early stages are more susceptible to pesticides and most feeding damage is done by hoppers in the later fourth and fifth instars. Unfortunately, early instars are small and can be difficult to see - you may have to get down on your hands and knees to scout effectively. Feeding activity (and hopper growth rate) both increase with temperature, so warmer weather increases the urgency of decision-making. Check the link below for a list of registered materials and recommended rates for grasshopper control on alfalfa and non-crop borders in Kansas.

www.entomology.ksu.edu/DesktopDefault.aspx?tabindex=179&tabid=513

J.P. Michaud

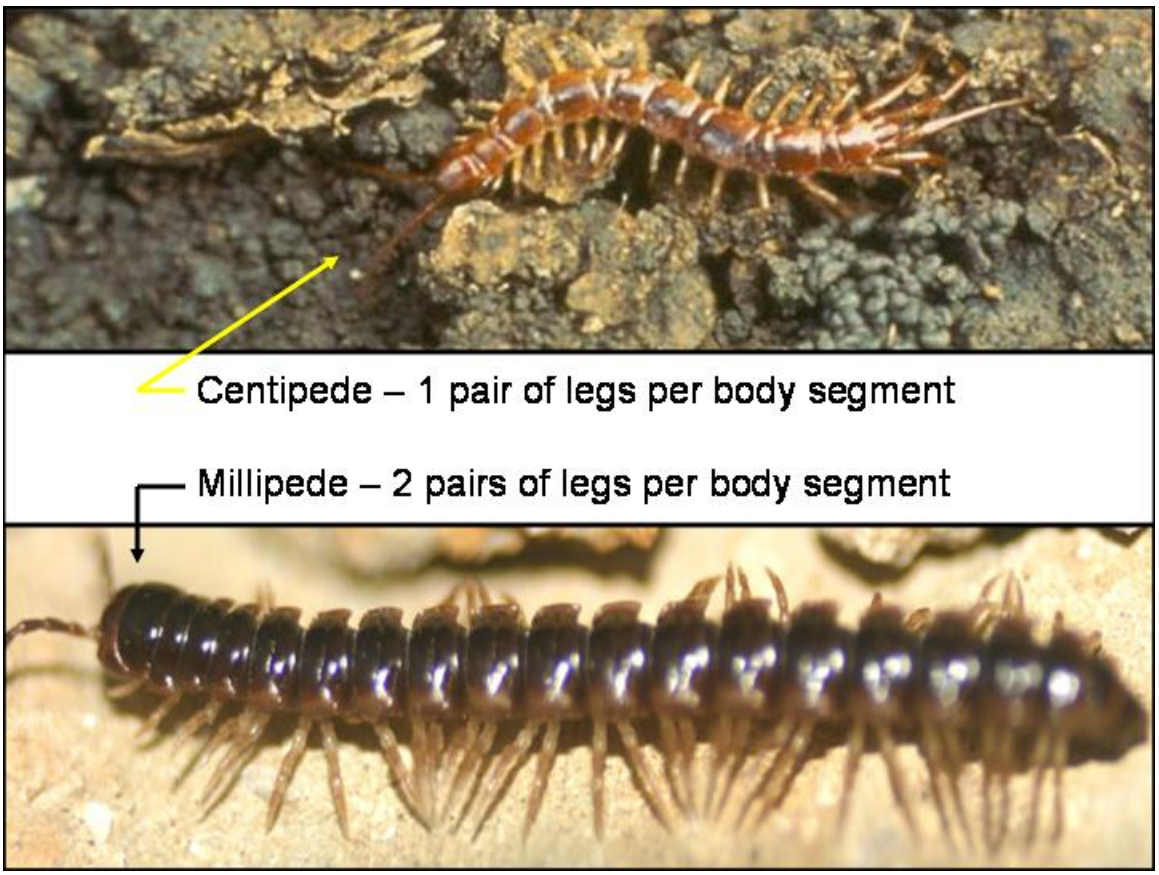
"SQUIRM!" …….. Revisited ------ Millipedes

There have been recent inquires into "worms all over the place". And the "worms" are actually millipedes. Rather than reinventing-the-wheel, I am re-running an article prepared for and appearing in Issue #12 of the 2008 Kansas Insect Newsletter. It was fairly thorough and descriptive of the wheres-and-whys of millipede invasions.

Soooooooo, read on:

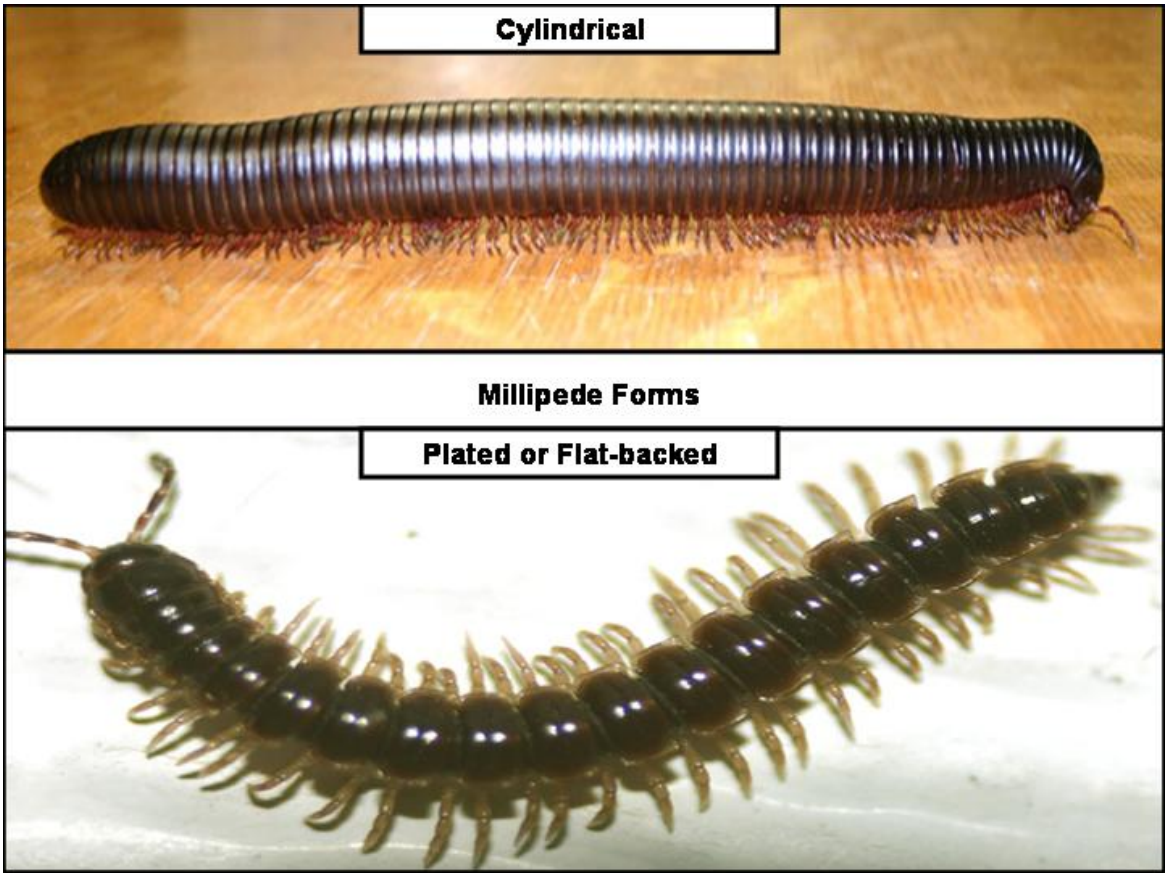
A 1976 horror film, "An avalanche of killer-worms….writhing across the land in a tidal wave of terror!". Thankfully, our current avalanche of worms are not "killers", but merely millipedes.

Millipedes are elongated wormlike arthropods. They can be differentiated from centipedes by virtue of the number of legs per body segment. Whereas centipedes have a single pair of body legs/segment, millipedes have 2 pairs.



(As an aside, actually what appears to be a single body segment in millipedes is, in fact, two fused segments, each with a pair of legs --- hence the 2 pairs of legs per body appearance)

There are 4 basic body forms of millipedes. The two most common are cylindrical and plated (or flat-backed). The cylindrical are sometimes referred to as "wireworms" (not to be confused with "true wireworms" – the larvae of click beetles), and when viewed from above, their legs are somewhat hidden due to their ventral position. The legs of flat-backed millipedes are more highly visible as they project outward from beneath the extended plate.



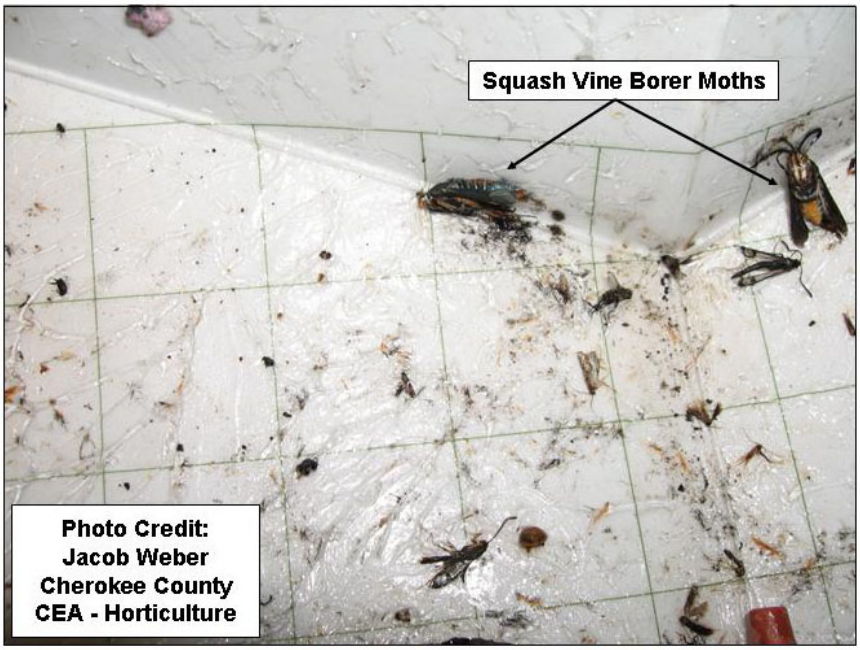
The life cycle of millipedes extends over a period of years. Depending of conditions, development from egg to adult may require 2 - 4 years, with adults living additional years. Thus over time, millipede populations build up (especially) in heavily wooded areas which satisfy their preference for shaded and moist environments where they primarily feed on decaying organic matter, notably leaf litter.

For reasons unknown, whether under extremely dry or wet conditions, millipedes “march”. This is when people report “invasions of worms”. And although millipedes are harmless (they do not bite or sting), they may sometimes feed on tender garden crops. The most common complaint, however, is that their mere presence is disconcerting. They are mostly observed around daybreak when massing on sides of buildings, patios/decks, driveways and sidewalks and decorative rocks. Especially on hot sunny days, they rapidly disappear as they seek protective shelter/cover, only to re-emerge during the ensuing evening.

Frustrations arise when attempting to control millipedes. Millipedes seek "hiding places" ---- any available crack or crevice in the soil, under bark mulch, under landscape stonework/gravel/plastic ground cover, leaf litter in and around homes (especially in country/wooded settings), up and down the bark of trees, etc. Elimination of these protected sites is impractical and impossible. Insecticides registered for use as perimeter treatments will eliminate those millipedes in the target area. However repeated applications will be required for the duration of millipede movements. Another nuisance factor: the dead millipedes will have to be swept up and disposed of. The best news is that millipede activities stop as suddenly as they began!

The Value of Pheromone Trapping ---- More on Squash Vine Borers

In last week's Kansas Insect Newsletter, I reported that Jake Weber reported that he captured his first squash vine borer in a pheromone trap in his garden in Columbus.



A couple of days later, Rebecca McMahon reported that she had captured her first squash vine borer (May 28) in a pheromone trap the Sedgwick County's Master Gardener's Vegetable Demonstration Garden. And here in Manhattan, I trapped my first squash vine borer on June 4. By knowing when moths are active, gardeners can be on the alert and inspect plants for the eggs of squash vine borers. And that is what Rebecca did.

While I have "read-the-books" regarding squash vine borers (not a new insect by any means ---- I have early literature dating back nearly 100 years ago), I have seen squash vine borer moths and squash vine borer larvae. I have never seen their eggs. But Rebecca did, and took and excellent image/photograph/picture (you pick your word) of the eggs which look as described in the literature: small (1 mm) flattened brownish eggs glued on plant stems and leaf stalks, especially near the base of the plant. Does Rebecca's image fit the description?

One recommended tactic against various insect pests is to use row covers to exclude the pest from the plant. In her communication, Rebecca made the point that the eggs were found on a plant which **was not** under a protective row cover ----- giving credence to the "exclusion tactic". If eggs are located, they can be removed ---- Rebecca said that they easily flaked off. Of course, care must be taken to "catch them" ---- if left on the ground,

the eggs will continue their development, and larvae will seek out the adjacent plant into which they will borer.

As plants grow, it may be very difficult to easily inspect plants for eggs as squash vine borer moth activities continue. And row covers will eventually have to be removed in order to allow bees access to flowers for pollination and the development of squashes. Thus it may be that a series of protective insecticide sprays be applied to kill newly emerged larvae before they are able to borer into plants. As far as making a specific insecticide recommendation: there currently are 377 products registered for use against squash vine borers ------ people need to go to retail outlets to see what products are being marketed in their respective locales.

Bob Bauernfeind

Report from the Kansas State University Insect Diagnostic Laboratory:

The following samples were submitted to the Insect Diagnostic Laboratory from June 4th to June 10th.

June 4 2010 – Riley County – Clover mite, dust mite, and collembolan in home
June 4 2010 –Sedgwick County – Chironomid flies around outbuilding
June 4 2010 – Sumner County – Millipedes in lawn
June 7 2010 – Ellis County – Syrphid fly and various debris in home

June 7 2010 – Riley County – Jumping oak gall on oak
June 7 2010 – Ford County – Pseudoscorpions in lawn
June 7 2010 – Rayville, MO – Spruce spider mites on Norway spruce
June 7 2010 – Miami County – Subterranean termite workers
June 7 2010 – Logan County – Possible spruce spider mite damage
June 8 2010 – Miami County – Common house spider and comb-footed spider around home
June 9 2010 – Johnson County – Woolly aphid in garden
June 9 2010 – Clay County – Honeysuckle aphid on honeysuckle
June 9 2010 – Douglas County – Carpet beetle larvae in home
June 9 2010 – Cheyenne County – Pine cone borer larvae in pine cones (family Tortricidae)
June 10 2010 – Clay County – Sap beetles on strawberries
June 10 2010 – Brown County – Euonymus scale insects on euonymus
June 10 2010 – Shawnee County – Jumping oak gall on oak

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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