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Kansas Insect Newsletter

For Agribusinesses, Applicators, Consultants, and Extension Personnel

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Spider Mites and Soybeans

 (click on image for larger picture)

Reports received in the last week indicate several fields in northcentral KS have been treated for spider mites. This is a little unusual but with the recent hot, dry weather and predictions of more of the same, mite populations are probably not going to be held in check by the weather.

Symptoms of sever spider mite injury (Figure 1) results from a combination of cell and tissue disruption, water loss, and heat stress. As mite feeding increases, leaves become yellow, bronze/brown, and may eventually drop off. Complete defoliation may result from heavy infestations. Variable yield reductions have been recorded, but generally 40-60% reductions are possible when fields are infested during late vegetative or early reproductive stages. This seems to be the growth stage (podding) of most of the beans treated thus far. After treatment, monitoring should continue as complete control is extremely difficult to achieve and spider mites have a tremendous capacity to increase. Generations may be completed in as little as four days at summertime temperatures with females producing as many as 300 offspring the first month after maturing. Thus, populations can quickly increase. There are two natural enemies of spider mites: a predatory mite and a fungal pathogen. Their effect on mite populations in soybeans is not well understood but we do know that for the fungus to be effective you must first have spores present, then at lest 12-24 hours of temperatures not exceeding 85 degrees with at least 90% relative humidity. So natural enemies are probably not going to help control mite populations this summer. Thus, chemical control is the only management tool available especially if plants are losing 50% of their foliage during late vegetative or early reproductive stages (i.e. pod-set). It is important to get complete coverage of upper and lower leaf surfaces and even then sometimes mite populations may recover quite

rapidly after treatment. A list of insecticides registered for control of spider mites is available at your local county extension office.

Jeff Whitworth

It’s Time to Treat for Cattle Grubs

Biology:

 picture by C.L. Hoelster, Texas A&M (click on image for larger version)

Cattle grubs are larval stage of “heel flies”, also called “warble flies”. Adult flies are large and hairy and resemble bees. Adults emerge in the spring and summer and live for less than a week (they do not feed). There are two species of cattle grubs, common cattle grubs and northern cattle grubs. In Kansas, common cattle grubs are found most frequently.

Adult females attach their eggs on the hairs of cattle legs; the flies are large and buzzing which causes cattle to panic and run wildly although heel flies do not bite nor sting (do not confuse heel flies with stable flies. Stable flies also land on cattle legs, however, they resemble house flies and bite and suck blood!).

The eggs hatch into larvae in several (4-7) days and larvae burrow into the skin causing the animal strong irritation. The young larvae migrate through the host tissues; common cattle grub larvae spend most of the development in the submucosa of esophagus (gullet); larvae of northern cattle grub develop mainly in the epidural tissues of the spinal cord. During the winter larvae of both species move to into animals back; by February most larvae reach the back where they cut a breathing hole trough the hide and form a warble (swelling) in the hide (significantly damaging the hide tissue). In the spring, grubs emerge through the breathing hole, drop to the ground and pupate in the soil. In Kansas, adult flies emerge from the pupae in (April - May), mate and females start looking for cattle to lay eggs.

Treatment:

In Kansas, treatments should be applied from June to October 1 - after heel season, but at least six weeks before grubs appear in the back. Treatments from October to February are risky because they may cause toxic reactions in cattle from dead grubs.

- Cattle in barns do not have to be treated because adult heel flies do not enter barns to lay eggs
- Young animals are more susceptible to cattle grubs than adult cattle.
- Do not treat in extremely hot days
- Do not treat sick or stressed animals
- Follow the label instruction exactly

I would recommend the following insecticides:

- Doramectin (Dectomax): Pour-On and Injectable from Pfizer
- Ivermectin (Ivomec): Pour-On and Injectable from Merial
- Eprinomectin (Eprinex): Pour-On from Merial
- Moxidectin (Cydectin): Pour-On from Fort Dodge

These products are all very effective against cattle grubs. In addition, some studies indicate that Moxidectin is less toxic to beneficial dung beetles in cattle manure.

Other available options for example include (all Pour-On):

- Coumaphos (Co-Ral 4% OS)
- Famphur (Warbex 13.2% OS)
- Fenthion (Tiguvon 3% OS)
- Phosmet (GX118 8% OS)

For additional information visit " Managing Insect Problems on Beef Cattle" C-671
http://www.oznet.ksu.edu/library/ENTML2/C671.PDF

Ludek Zurek

Tomato Plants and "Big Green Worms"

The measure of a tomato plant's popularity is the fact that almost every home gardener includes it in their garden plot. Or, if space is limited, and an individual is restricted to a single plant, more likely than not, that single plant will be a tomato plant. People anxiously watch as their plants grow . Plants are watered and pampered in anticipation of that first tomato which will likely never see the inside of a house because it was immediately consumed upon its being picked.

Well tended tomato plants grow prolifically, and have lush green foliage. However, a plant which looks relatively healthy one day (Figure 1) can rapidly go downhill within

several days (Figure 2). The leafless condition was caused by “green worms”. Most times, the green worms are not casually observed. However, with patience, one can find the usually motionless worm(s) which blend(s) into the background foliage (Figure 3).

Figure 1

Figure 2

Figure 3

The “green worms” are either tomato hornworms or tobacco hornworms. It is of academic interest as to which is which. In fact, both species may be present at the same time. While being described as “green worms”, there are varying degrees of green depending on genetic background. Thus either species may be light or dark in color. There are, however, consistent distinctive markings which are characteristic of each species. In a side by side comparison, the tomato hornworm larvae has a black horn and 8 diagonal stripes which hook backwards to form an “L” or “V” (Figure 4, upper). The tobacco hornworm has a red tail and 7 diagonal stripes with no backward hooks (Figure 4, lower).

Figure 4

People often wonder where these big larvae came from ----- thinking, “Well, they weren’t there yesterday, so they must have invaded my garden from some outside source”. In actuality, the larvae were present for at least the past month. And although feeding ravenously throughout that period of time, their feeding went unnoticed because they were small and because tomato foliage was very thick/lush. It is not until larvae approach the end of their feeding cycle that they quickly defoliate vines to a degree that captures our attention.

“Hornworms” are the larvae of sphinx moths, sometimes referred to as hawk moths and/or hummingbird moths. In Kansas, there are two generations of tomato and tobacco hornworms each season. They overwinter as pupae enclosed in earthen cocoons. Many times, people unearth these cocoons when they prepare the soil in their gardens. The earthen cocoons are 2-3-inches long (Figure 5). Inside of the cocoon is the actual

overwintering pupa (Figure 6). A very characteristic feature of sphinx moth pupae is the prominent tongue case (often times referred to as a "pitcher handle") (Figure 7).

Figure 5

Figure 6

Figure 7

Moth emergence may begin as early as late May, but certainly in June. For all practical purposes, the moths of both the tomato and tobacco hornworms have the same general size (4 to 5-inches from wingtip to wingtip) and coloration (Figure 8). They are most active during evening hours, and therefore go unnoticed. Eggs also go unnoticed because they are deposited on lower leaf surfaces, and because (of their greenish coloration) they somewhat blend in with the green leaves on which they are deposited (Figure 9). As stated above, larvae are not detected until they are of sufficient size (return to Figure 2) so as to cause significant defoliation.

Figure 8

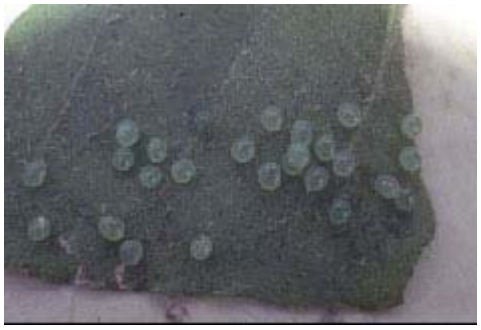

Figure 9

If hornworms are encountered, several choices can be made as to how to deal with them, the first being the "do-nothing" approach. Merely look at the beauty of the larva (Figure 10), and allow it complete its feeding cycle. If there are several to many hornworms, they can be hand-picked and disposed of. Although hornworms may thrash about and "spit"/regurgitate their stomach contents, they do not bite. Nor are they capable of stinging of piercing your skin with their "horn". Larvae which should not be discarded are those carrying small white cocoons (Figure 11). The cocoons contain the pupae of a small wasp which parasitizes hornworm larvae.

Figure 10

Figure 11

For those who are insistent on using insecticides against hornworms, various materials are registered for use. Visit a nursery or garden shop for the product availability. People wishing to follow an organic insect control program can utilize Bt products. However, those materials must be applied as preventative treatments throughout the entire growing season. The effectiveness of the Bacillus thuriengensis endotoxin crystals is dependent upon their being ingested when larvae are small and in their early developmental stages.

Bob Bauernfeind

Spider Mites on Tomatoes

Spider mites are the cause of mid-summer woes for tomato growers. Often times, plants taking on a bronzed appearance (Figures 12). Upon closer inspection, stippling can be seen on individual leaves (Figure 13). Affected leaves eventually die and turn brown (Figure 14).

Figure 12

Figure 13

Figure 14

While spider mites are generally present in late spring and early summer, their initial populations levels are low. However, because mites have relatively short life cycles (under ideal conditions, a generation can be completed in a weeks time) and because hot

dry summer conditions favor developmental rates, their populations rapidly escalate. Although small in size (Figure 15), the cumulative effect of many mites results in the rapid deterioration of tomato plants. In fact, by the time damage becomes apparent, many generations of mites have already occurred, and the present population consists of all life stages (Figure 16).

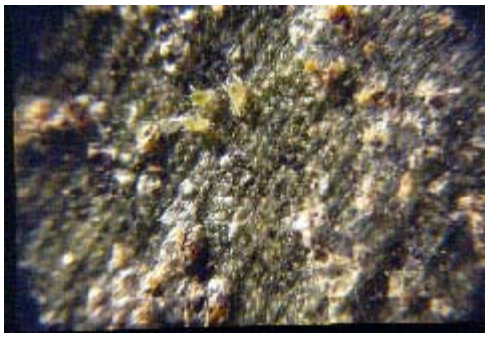

Figure 15

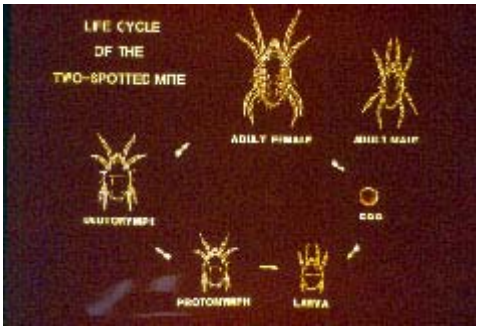

Figure 16

Spider mites tend to congregate on lower leaf surfaces, usually beginning on bottom leaves and working their way to upper leaves. Spider mites damage plants by inserting their stylet mouthparts into individual plant cells and withdrawing cellular liquids and contents. Removal of chlorophyll results in the aforementioned stippling. The coalescence of dead cells results in the bronzed/brown appearance of leaves/plants.

Plants in this late stage of mite activity can be saved. Horticultural oils, horticultural soaps and Kelthane are the 3 most popular materials used to combat spider mite infestations. The key to mite control is **thorough spray coverage** and **timely follow-up treatments**.

Thorough spray coverage is especially important when using oils and soaps because these two materials require direct contact with the active mite stages. Once dried, oils and soaps offer no residual control. While Kelthane does have some residual capabilities, thorough spray coverage is still critical when attempting to control mites. Factors complicating thorough coverage include: mites favoring undersides of leaves; mites concentrated on lower leaves, many of which lie on the ground; dense foliage; a webbing (produced by mites) which shields mites from miticide treatments.

Timely follow-up treatments are required because initial spray treatments have little effect against mite eggs. And once 6-legged larvae emerge from eggs, they proceed with unimpeded development. Thus the necessity of the second spray treatment application **2 to 3 days** after the initial treatment. All eggs will have hatched and no mites will have attained adult status to deposit additional eggs to begin the mite population buildup anew. As with the first spray treatment, thorough coverage must be attained with the follow-up treatment. Once mite populations have been eliminated, plants will produce new foliage, and regain a healthy form.

Bob Bauernfeind

Insect Diagnostic Laboratory Weekly Report

The following samples were submitted to the Insect Diagnostic Laboratory for the week of July 28 through August 1, 2003:

- 7-28-2003, Saline County: Clover Mites and other arthropods in home.
- 7-28-2003, Lyon County: Antlike Flower Beetle, Carpet Beetle in home.
- 7-28-2003, Cheyenne County: Digger Bees on Sunflower.
- 7-31-2003, Johnson County: Windscorpion from home.
- 7-31-2003, Riley County: Mealybugs on Sericea lespedeza.
- 8-1-2003, Nemaha County: Springtails in home.
- 8-1-2003, Saline County: Carpenterworm in Oak.

If there are any questions regarding these samples or about the identification of any arthropod please contact the Insect Diagnostician (Bobby Brown) at 785-532-6154 or bbbrown@oznet.ksu.edu .

Sincerely,

Jeff Whitworth	Ludek Zurek	Bob Bauernfeind	Bobby Brown
Extension Specialist	Assistant Professor	Extension Specialist	Diagnostician
Entomology	Entomology	Entomology	Entomology