Kansas Insect Newsletter

For Agribusinesses, Applicators, Consultants and Extension Personnel

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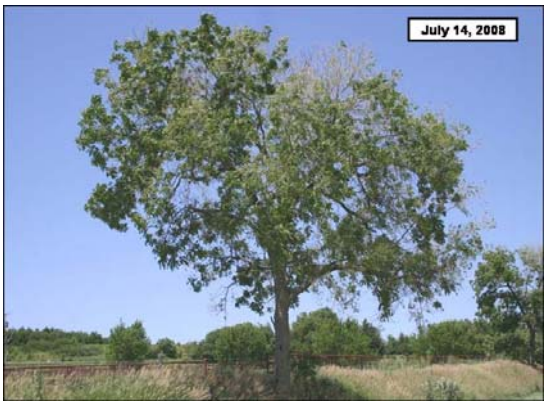
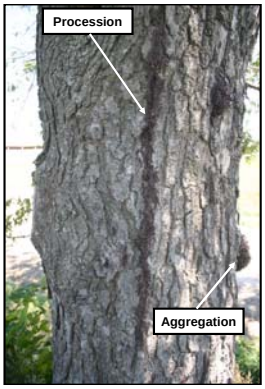
Defoliating Caterpillars Redux……..

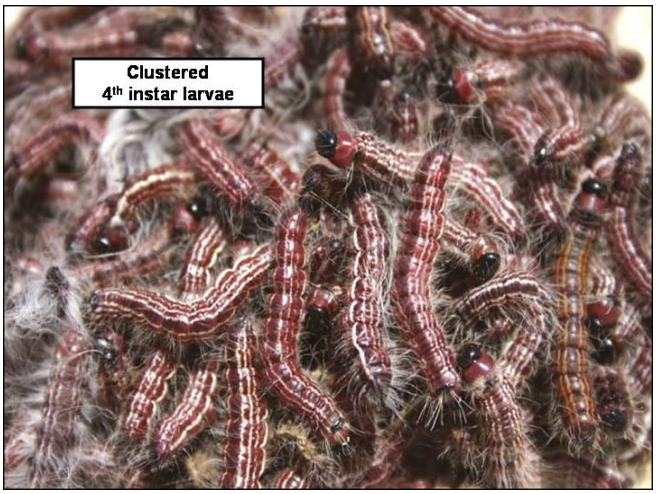
In the June 6, 2008, issue of the Kansas Insect Newsletter, it was reported that walnut caterpillar moths and yellownecked caterpillar moths were being collected in blacklight traps. It was further stated that one cannot predict where caterpillar infestations will occur, but that in 5-6 weeks, their feeding activities will be a giveaway as to their presence. On cue (then) this past week, walnut caterpillar activities have been received from as far south as Chautauqua County, and north to Dickinson County.

Fully leafed-out trees in June are showing signs of current feeding as evidenced by moderate defoliation.

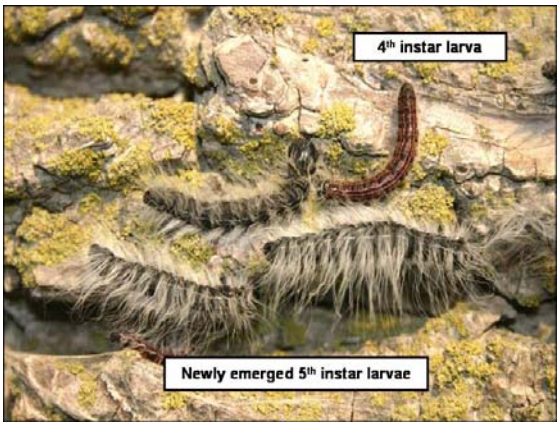


The larvae responsible for this damage are 4th developmental stage walnut caterpillars. Walnut caterpillars have the habit of forming processions as they migrate en masse to larger branches or trunks where they form large aggregations.

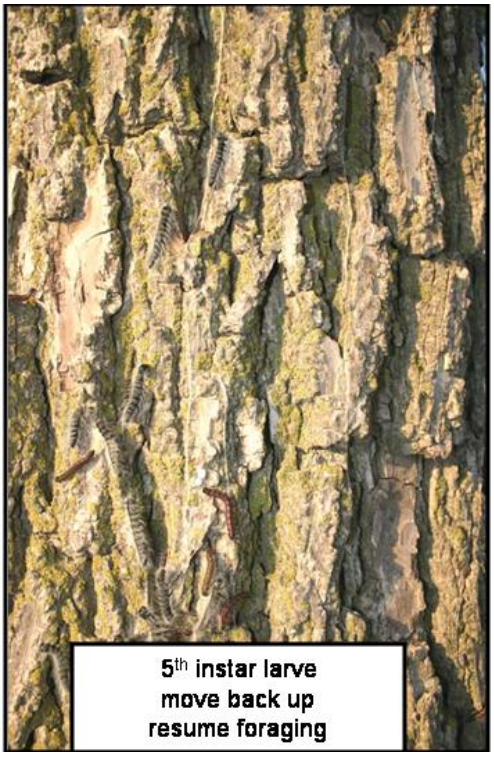




Almost overnight, the aggregation takes on a fuzzy appearance. Upon closer observation, the reason for the "fuzziness" is seen to be attributed to the dramatic transformation of 4th instar brick-red larvae into final (5th) instar grey/black long-haired caterpillars.



At this point in time, "grey" larvae migrate back up into the tree canopy to resume feeding for several days until the completion of their development. This is the short period of time during which complete defoliation occurs.

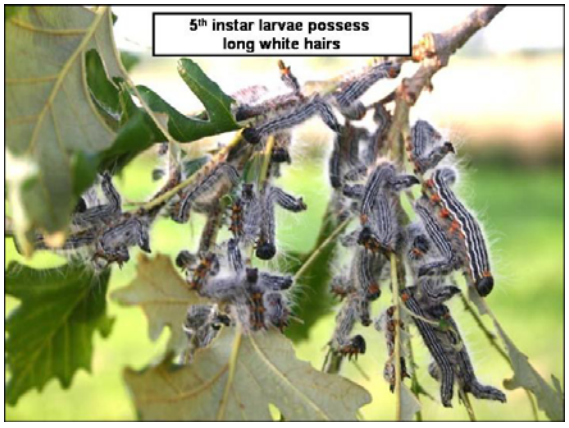


Mature larvae next move to the ground, sometimes by descending on silken threads, but more often by directly dropping to the ground, or crawling down the tree trunk. They seek a sheltered niche in which to pupate. Newly emerged first generation moths then deposit eggs for the second generation of walnut caterpillars.

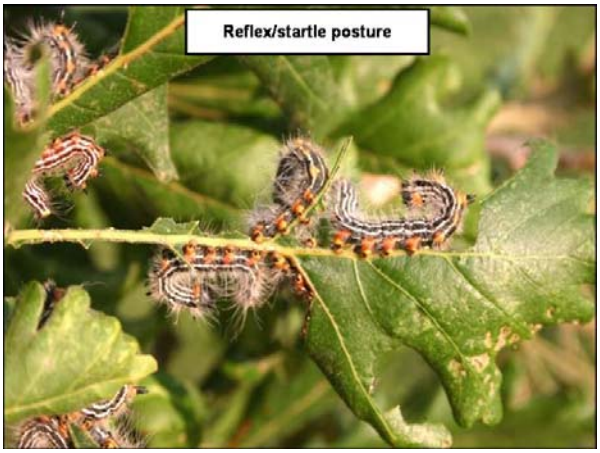
There is little to be done to head off walnut caterpillars. By the time they are detected, they have essentially run their course. Even if aggregations are noted early on, removal or spraying those within reach would be treating the tip of the iceberg. LET THEM RUN THEIR COURSE! This early in the season, trees generally produce a new flush of foliage from auxiliary buds which were ignored by the caterpillars which sought out/fed on foliage.

And yellownecked caterpillars? ……. They tend to be a little less dramatic than walnut caterpillars in that they do not have the habit of creating aggregations when they enter their next instar stage of development. Rather, they molt wherever they are feeding when initiation of the molting process occurs.

Their development mirrors that of walnut caterpillars. But because they have a wider host range, their populations may be more dispersed, and they, therefore, less frequently encountered.



Yellownecked caterpillars sometimes simultaneously display a “reflex/startle” reaction where they raise their head and tail ends.



Bob Bauernfeind

Soybean Aphids

Soybean aphids have been verified from soybean fields in Riley Co. Dr. Brian McCornack identified these very small, lime green aphids on 11 July, from several small colonies established probably 7-10 days prior. This is relatively early for soybean aphids in Kansas, although they were first detected on 12 July, in 2007. In previous years it was not until late July or even August before colonies were established. Soybeans are most vulnerable to aphid damage during the vegetative and early reproductive stages, which are the growth stages of most of the beans throughout the state at this time. Also, double-cropped soybeans may be particularly vulnerable. These aphids have the capability of rapidly reproducing, so monitoring soybean fields for the next 4 – 6 weeks will be essential to determine soybean aphid damage potential. Please go to

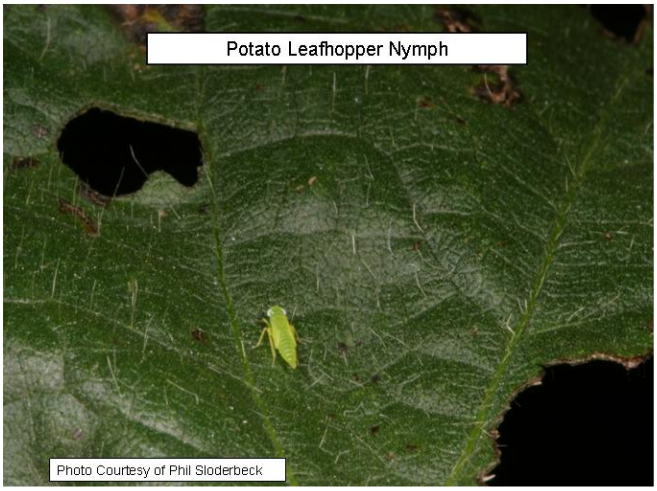
http://www.entomology.ksu.edu/DesktopDefault.aspx?tabindex=347&tabid=560

for more information and e-mail or call Jeff Whitworth (jwhitwor@ksu.edu : 785-532-5656) or Brian McCornack (mccornac@ksu.edu : 785-532-4729) to report aphid infestations.

Jeff Whitworth Brian McCornack

Potato Leafhoppers

Soybean fields in North Central Kansas seem to have relatively high populations of potato leafhoppers. These small, lime green, wedge shaped insects are an annual problem in alfalfa but can also affect soybeans. Although we have not generally had a problem, other states have seen yield reductions due to potato leafhopper infestations. Most are currently in the immature or nymph stage and can be frequently found on the underneath side of leaves where they feed by sucking the juice from the veins. Symptoms of feeding damage start as yellow patches of the outside of leaves and may cause crinkling and cupping of the leaves. This can be confused with herbicide damage. If feeding continues the leaves may wilt and plants become stunted. Plants under moisture stress seem to be more susceptible to damage, especially young plants with softer pubescence. We have no well established treatment thresholds for Kansas but if you need more information relative to management decisions please e-mail or call me at the above listed numbers/address.



Corn

Western corn rootworm adults were detected for the first time on 17 July, in Riley Co. Thus, rootworm feeding and subsequent damage should be about over, at least in North Central Kansas.

Jeff Whitworth Holly Davis

Second Generation Corn Borer

Southwestern corn borers are reportedly pupating and beginning to emerge south of Garden City. Thus it is now time to be scouting for second generation egg masses on any non-Bt corn fields. Egg laying generally begins in mid-to late July and continues into August. Information on European corn borer management can be found on our web site at: http://www.entomology.ksu.edu/DesktopDefault.aspx?tabindex=243&tabid=592 and for Southwestern corn borer at: http://www.entomology.ksu.edu/DesktopDefault.aspx?tabindex=253&tabid=597.

With the recent increase in commodity prices it is probably a good time to reconsider treatment thresholds for these pests. In 1984 we published a corn borer management guide that contained the following equation to calculate an economic threshold for the European corn borer: Economic Threshold (# Larvae per Plant) = Control Cost / (Yield Loss per Borer * Market Value*Yield * Proportion of Larvae Killed)

European corn borer threshold using 1984 Data

Control Cost ($ per Acre)	12.50
(Insecticide plus application cost.)	
Yield Loss per Borer	0.044
(This number varies depending on the stage of corn growth: 0.044 for late whorl, 0.066 for pre-tassel, 0.044 for pollen shed, 0.030 for blister and 0.020 for dough).	
Market Value of Corn ($/Bu)	2.50
Expected Yield (Bu/A)	150
Proportion of Larvae Killed	0.95

Thus the equation becomes:$12.50 / (0.44*$2.50*150*0.95)

And Economic Threshold (# Larvae per Plant) = 0.80

Then to convert this threshold to the # Egg masses per plant needed to reach economic threshold take (Economic Threshold * Proportion of Eggs Laid)/(Proportion Surviving * Eggs per Mass)

Economic Threshold (Larvae per Plant)	0.80
Proportion of Eggs Laid	0.50

(Estimates are based on three assumptions. First those fields are being scouted regularly. Second, that 5% of oviposition has occurred by the time the first egg masses are found, Third, that the egg laying period will last about 3 weeks. Thus, about 8 days after the first eggs are found about 50% of the eggs should have been laid.)

Proportion Surviving	0.20

(Based on studies in Kansas a value of 0.20 is recommended)

Eggs per Mass	20

Thus the equation becomes: (0.80*0.5)/(0.2*20) = Egg Masses per plant need to reach the economic threshold = 0.10 or 10% of the plants with an egg mass.

If we plug in some 2008 prices the threshold will change significantly.

European corn borer threshold using 2008 Prices

Control Cost ($ per Acre)	14.00

(This cost could vary greatly depending on products used, however one might also need to adjust the proportion of larvae killed if less expensive lower rates are used)

Yield Loss per Borer	0.044
Market Value of Corn ($/Bu)	6.50
Expected Yield (Bu/A)	205

Proportion of Larvae Killed 0.95

Thus the equation becomes:$14/ (0.44*$6.50*205*0.95)

And Economic Threshold (# Larvae per Plant) = 0.25

Then to convert this threshold to the # Egg masses per plant needed to reach economic threshold:

Economic Threshold (Larvae per Plant) 0.25

Proportion of Eggs Laid 0.50

Proportion Surviving 0.20

Eggs per Mass 20

Thus = (0.80*0.5)/(0.2*20) = Egg Masses per plant need to reach the economic threshold = 0.03 or 3% of the plants with an egg mass.

The threshold information for Southwestern corn borer has never been as closely defined as for the European corn borer, but in the past we have used a fairly similar threshold for the two pests. At first this seems odd given that the damage potential is much greater for Southwestern corn borer. However, one must remember that the eggs are often laid individually or with only one or two other eggs. So 10 percent of plants with southwestern corn borer egg masses would actually be a much lower threshold than the European corn borer if counting eggs per plant.

Treatments should be made after one reaches the economic threshold and as eggs begin to hatch and larvae are visible in the leaf axils. Then if fresh eggs are still observed seven to 10 days after the first application a second application may be justified. In general fields that exceed treatment thresholds early in the oviposition period are more likely to benefit from a second application, and if the treatment threshold is not reached until late in the ovipostion period then often one application may give adequate control. Keep in mind that once borers enter the stalk, ear tip, or ear shank, insecticides will not be effective.

At three percent the threshold is so low that it is tempting to say: Why scout? Why not just treat every field? It is also tempting to conclude that with thresholds this low; why not add some insecticide every time any

other treatment is applied? Obviously if you remove the application cost then the threshold would be even lower. There are several reasons why treating without knowledge of current pest populations is a bad idea. One is that repeated insecticide applications can lead to resistance. Another is that insecticides can have significant impact on non-target insects and beneficial organisms which can lead to secondary pest outbreaks. Plus there are potential health hazards to applicators and field workers. However, possibly the biggest reason is because if the timing is wrong the application may have little or no impact on the target pest. Note that the economic threshold is based on getting 95% control. If the timing is off this could fall dramatically and in many cases there would be little or no economic benefit from making a treatment. Worse yet, if treatments are applied too early, the majority of the eggs could hatch after the residual of the insecticide is gone and one could suffer severe corn borer injury even though one paid for an insecticide treatment. This can especially be true when insecticides are added to fungicide or herbicide applications without regard to proper timing for corn borer or other potential pests. So even though the thresholds are much lower given the commodity prices, proper scouting and timing are need to collect the benefits from any insecticide applications.

It is still too early to know how heavy corn borer infestations will be this season. In general European corn borer pressure has been low the last few years; however Southwestern corn borer remains fairly high in some areas of southwest and south central Kansas. While the emphasis seems to be on how low treatment thresholds might go, don't lose focus on the fact that with higher commodity prices returns will be significantly higher for heavily infested fields treated properly for corn borer. With $6.50 corn and 200 bu/A yields and 1 ECB larva per plant at blister stage the loss would be $40 per acre.

It can also be interesting to see how the threshold would change as treatment costs, yield and commodity prices change. If we leave the corn price at $6.50, and the yield at 205 and vary the treatment cost, we find at a treatment cost of $10 the number of egg masses would drop to 0.02 and at $5 it would drop to 0.01. If we set the treatment cost at $14 and the yield still at 205, we have to raise the price to $8.50 to lower the number of egg masses need to justify control to 0.02 and to $14 to drop it to 0.01. Or if we hold the price of corn at $6.50 and the treatment cost at $14 we would have to produce 260 bu/A corn to drop the egg mass number to 0.02 and to 430 to drop it to 0.01. Of these factors treatment cost may be the one that is most directly in the control of the producer, by selecting product carefully and timing the applications to get the highest level of control.

If you would like to try to calculate an economic threshold based on your own economic information try down loading the following excel spreadsheet and inserting your own data:
http://www.entomology.ksu.edu/DesktopModules/ViewDocument.aspx?DocumentID=4577

Phil Sloderbeck

Sunflower Moth Alert

Early-planted sunflowers that are at or near bloom should be scouted for sunflower moth. The southerly summer winds have begin to blow and we are currently observing a large number of migrant moths arriving in the Hays area. Fortunately, there are not nearly as many wild sunflowers this year as last year, so we can be

hopeful that pressure from 2nd generation moths will not be as bad. Fields with 1-2 moths per five flowers should be treated as soon as possible to minimize egg laying. Following the re-entry period, scouting should continue until petal-fall in case additional treatments are required. Materials recommendations can be found here:

http://www.oznet.ksu.edu/library/entml2/MF814.PDF

More information on sunflower moth can be found here:

http://www.entomology.k-state.edu/DesktopDefault.aspx?tabindex=345&tabid=547

J.P. Michaud

Weekly Report from the Kansas State University Insect Diagnostic Laboratory:

The following samples were submitted to the Insect Diagnostician Laboratory from July 11th to July 17th.

July 11 2008: Sedgwick County – Possible carpenter ant damage and dermestid beetle larvae in home
July 11 2008: Meade County – Pine needle scale (parasitized) on Austrian pine
July 11 2008: Meade County – Nantucket pine tip moth larvae in pine bush
July 11 2008: Sherman County – European honey bee swarm in wall of business
July 14 2008: Ottawa County – Carpenter Bee
July 14 2008: Labette County – Tussock moth caterpillar from lawn
July 14 2008: Mitchell County – Sphecid wasp in flower garden
July 14 2008: Riley County – Two immature brown recluse spiders inside home
July 14 2008: Butler County – Dobsonfly – adult male
July 14 2008: Greenwood County – Gallmaking aphids and leafminer damage on Green Ash
July 16 2008: Shawnee County – Green June beetles found on tree trunk
July 16 2008: Pratt County – Carrion beetles found in corn crop
July 16 2008: Shawnee County – Brown dog tick – engorged female
July 17 2008: Pottawatomie County – Squash vine borer damage to cucumber plants
July 17 2008: Riley County – *Carpophilus* sp. – sap beetle found in bee hive
July 17 2008: Johnson County – Ichneumonid wasp found in home
July 17 2008: Riley County – Stag beetle – male

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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