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Kansas Insect Newsletter

For Agribusinesses, Applicators, Consultants, and Extension Personnel

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Soybean Insects - Late-Season - Watch Fields Closely

With the possible exception of determining the identity of fields where elevated soybean stem borer infestations were thought to occur, many people mistakenly thought that the threat of insect damage to soybeans was over for this year. However, the calls and e-mails that I have received during the last few days demonstrate that the need for crop scouting and insect management decision-making for other soybean pests has not reached an endpoint yet.

Harvesting stem borer infested fields as soon as possible helps minimize preventable losses caused when plants lodge or break free from their bases after tunneling larvae girdle the stems internally at or just above the soil line. The girdling damage is an additional form of plant injury that develops following extensive stem tunneling. Stem borer larvae inflict this type of damage as they prepare to overwinter within soybean plant stem bases. Quantifying the severity of soybean stem borer infestations now is recommended because the prevalence of this pest appears to be very high in many locations where it has been a problem in past years.

As mentioned last week, significant defoliation caused by insects is making soybean foliage more ragged than usual in many areas. Plus, other insects are feeding directly on pods and damaging developing beans to a greater degree than normal in some fields. After receiving a number of communications on this subject and pulling notes from several sources together, it has become clear that this is a very widespread and unusual event. Feedback from ag chemical reps/consultants who work Kansas and Missouri and communications from a colleague at the University of Missouri indicate that our neighbor to the east is experiencing similar problems.

The culprits causing these concerns are varied, but most people mention one or more species of caterpillars.

The majority of reports tied recent leaf tissue losses with high numbers of green cloverworm (GCW) larvae that were or still are present in some parts of Kansas. GCW larvae are light green with three pairs of white stripes running the length of the body. In addition to the three pairs of legs near the head, three pairs of fleshy prolegs are located near the middle of the body, and one additional pair is found at the rear of the insect. Many GCW larvae wriggle violently when disturbed in a defensive behavior that can help them escape insect predators and parasitoids intent on using them as a food source. Right now, more than one GCW larva per leaf is present in some areas and scouts are reporting large numbers of very tiny larvae. Tiny larvae do not feed all the way through the leaf, creating a translucent window-like appearance. Obviously, those sites may experience more significant defoliation unless something halts their growth and survival. In some years, GCW larvae can be found feeding on soybeans throughout September.

Green cloverworm larva

Window feeding

It is important to realize that green cloverworm larvae are susceptible to fungal and viral infections that can destroy an outbreak population in just a few days. In fact, Wednesday evening (August 31), I detected the initial signs that some GCW larvae in the Manhattan area were beginning to die from a specific fungal infection that causes their larval bodies to become dried/hardened white remnants of their former selves in death. These mummified remains may be present on the ground or can remain up in the foliage if wind or rain has not knocked them off the plants. Large numbers of spores will have left the bodies and be infecting other larvae nearby, frequently leading to a total population crash without the use of insecticides in a short period of time. Dense green cloverworm populations and moist conditions help encourage the development of an epizootic that can eliminate most living larvae.

Fungal-killed green cloverworm larva

As you might expect, many GCW also serve as food for a number of predatory insects. Interestingly, in parts of the deep South, green cloverworm larvae are ignored or have sometimes been considered beneficial because low populations are thought to serve as a food source for predators that later help hold more serious defoliators in check. Our production system is simpler in that Kansas does not generally have follow-up pests, so GCW are important for the damage they themselves inflict. Unfortunately, when high populations persist in Kansas, natural control through disease or predation may be realized after economic damage has been sustained. This may be one of those years based on the numbers of reports where insecticide sprays seem to have been or are being justified in a number of fields.

In planter-sown fields, sample for green cloverworm larvae with a shake cloth placed on the ground between two adjacent soybean rows. An old, light-colored pillowcase with a couple of dowel rods placed inside the open end, along each edge, works well for this purpose. Bend about one foot of plants from each row over the cloth and shake them vigorously. Repeat this process at 10 or more locations in the field and average the results. The sidebar on page 3 of our 2005 Soybean Insect Management recommendations (MF-743) has a description of a Texas Vertical Beat Sheet that can be used to sample narrow-row soybeans planted with a drill.

Shake cloth between the rows and plants being shaken

Treatment thresholds from full pod set through beginning seed development stages revolve around 11 larvae per foot of row if beans can be sold for $8 per bushel, whereas it takes 13 larvae per row foot to trigger treatment if the price is $6.50 per bushel, and as many as 15 larvae per foot of row if the crop value is only $5.00 per bushel. Resample the field in 7 to 10 days if five, six or seven larvae or fewer, respectively, are found when sampling. Populations between these levels should be re-sampled at more frequent intervals, possibly every 3 to 4 days to determine if the damage is increasing or diminishing. When pods are forming and beginning to fill, a loss of more than 20 percent of the foliage may decrease yields. Rarely is a yield reduction associated with defoliation beginning after the beans have nearly filled. If control costs are higher than $6.50 per acre, adjust thresholds upwards. Recent rapid changes in fuel expenses associated with

making an application can change this relationship such that more larvae would be needed to trigger a break-even treatment. Factors such as prevalence of natural control agents, previous defoliation, moisture availability, larval age distribution, and yield potential influence this relationship to some degree. Fortunately, green cloverworm larvae are not difficult to kill with most registered insecticides if that step becomes necessary for some growers.

In addition to significant GCW defoliation, scattered locations have experienced or are experiencing much heavier than normal populations of corn earworm (CEW) larvae on top of what had been a very high second generation infestation of bean leaf beetle (BLB) adults. Unlike GCW (which is a foliage feeder), earworms and bean leaf beetles can and do feed directly on the pods, chewing into developing seeds. That pattern of feeding damage is harder for the plant to recover from than moderate levels of defoliation since yield components (beans that could be harvested and sold) are actually consumed. Depending on the product, it may take 3 to 4 or more beans per plant at normal plant populations to pay for an insecticide treatment, so pay particular attention to these pests if pod feeding is taking place.

Unlike GCWs, corn earworms can be a more difficult pest to control. They sometimes feed deep within the protective canopy and are not as susceptible as GCWs to many insecticides. That is one reason that we list 17 products for GCW control and only 12 for CEW suppression in our 2005 Soybean Insect Management Recommendation guide. While a grower may knock a green cloverworm population of any size worms flat with the lowest labeled rate of many popular products that is not the case with large corn earworm larvae. Higher insecticide rates may be called for and even then, large larvae frequently are very difficult to kill. This tolerance explains why the threshold for CEW on soybeans typically calls for treatment when an average of one small earworm larva per foot of row is detected. Corn earworms can be identified by the presence of many tiny microspines arising from their skin surface, particularly on the back and sides of their bodies. Confirm that earworms are still present and that you did not miss the spray window or you may senselessly apply an insecticide to plants that suffered damage sometime in the past. Insecticide sprays do not replace lost yield, but if used when justified they can protect yield potential that is at risk. In some locations, earworms may have cycled through and have pupated, whereas other reports indicate these larvae are still relatively common and are causing damage.

Corn earworm larva

A scattering of reports suggests that we should also be watching newly seeded alfalfa closely for spotted alfalfa aphid infestations. Young plants that are just becoming established have no reserves and are

particularly susceptible to stress and loss. Fall armyworms also sometimes cause serious problems when growers are trying to establish new stands of alfalfa - so check these fields closely. This latter statement is made all the more relevant because we are receiving a few reports that indicate some milo fields are becoming infested with fall armyworms and corn earworms. Thus far, reports of head damage on sorghum have not been widely observed.

The only way to tell if local fields are infested is to spend some time looking. Do not get caught by surprise. As indicated, it is not too late for serious insect damage to occur in certain fields if very high numbers of some of these arthropods develop. Crop maturity, in addition to insect density information, can be important in determining the benefits or costs associated with applying an insecticide. Remember to consider pre-harvest waiting intervals when selecting among alternative insecticide treatments. Refer to our crop recommendations http://www.oznet.ksu.edu/library/ENTML2/Mf743.pdf or our website http://www.entomology.ksu.edu/DesktopDefault.aspx for more information.

As always, realize that many areas will escape the need for any type of treatment. Double-crop soybeans or those with delayed maturity are probably the most susceptible to defoliation damage. As mentioned, if bean filling is essentially complete, defoliation will not cause yield loss.

It is so important for people who spend time in fields to drop us an e-mail, make a call, or otherwise share their knowledge when an insect problem seems to be getting out of hand. A big thanks to the long list of individuals who provided information that laid the groundwork for this update.

Randy Higgins

Corn and Soybean Insect Pest Handbooks

Doug Jardine, a K-State Research and Extension Plant Pathologist, just forwarded the following information that should be of value to many people working with corn and soybeans. The Handbook of Soybean Insect Pests and The Handbook of Corn Insect Pests are available for purchase at a cost of $59.00 for each text through an arrangement with the American Phytopathological Society (APS). In years past, these well-designed guides were available from the Entomological Society of America (ESA). From now on, orders should be placed through APS by going on-line at

http://www.shopapspress.org/new-from-aps-press.html or calling 1.800.328.7560 toll-free. I would be remiss if I did not recognize that an outstanding series of disease-oriented diagnostic handbooks, frequently cited by Doug and other KSRE plant pathologists, can be obtained through APS at

http://www.shopapspress.org/disease-diagnostic-series.html .

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Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

Sincerely,

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