FOCUS on South Plains Agriculture

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Texas Cooperative EXTENSION
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Cotton Insects

Cotton Aphids

Cotton aphids are in general decline throughout the region, and have outright crashed in many areas. We saw populations averaging over 100 per leaf on 9 August drop to less than 5 per leaf within 4 days. Why the rapid drop? It's hard to attribute the crash to one factor. First, cotton aphids prefer cool temperatures and we experienced a fairly rapid increase in daily maximum temperatures into the mid and upper 90's in early August. Such a rapid increase in temperature was undoubtedly hard on the aphids, and based on the fact that at this time we saw the population shift from one primarily composed of green and dark colored aphids to the smaller light green and yellow colored aphids is indicative of a population that is stressed. Increased boll load and nearing cutout may also impact the aphid population since nitrogen will be shifted from more vegetative growth towards filling the bolls. This essentially denies the aphids the amino acids they thrive on. These environmental and physiological factors coupled with a lot of lady beetles, a smattering of parasitism, and a fair amount of fungus infected aphids all leads up to an unhealthy population. Some areas still have a fair number of aphids, but in all likelihood these will probably not have to be treated. For now it best just to monitor the populations closely and be patient. If your aphid population is composed primarily of the small yellow color morphs, then you can bet that the population will most likely decline over the coming week.

Whether or not the aphids come back is not an easy question to answer. Generally speaking, once a large population of aphids has occurred it is uncommon for them to resurge, but it can happen. Usually this resurgence will be the result of taking out the beneficials with broad-spectrum insecticides targeting bollworms or *Lygus*. When they do come back in these cases, the populations usually do not attain extremely high numbers, usually take 3 to 4 weeks to develop, and tend to be comprised of the less reproductively fit small yellow morphs. However, if a resurgence occurs when bolls are beginning to open, then we have to be very wary of sticky cotton.

Lygus

Lygus have not been plentiful in cotton since the mid July, but I can pick them up in low numbers pretty regularly. Damage to bolls has not been very noticeable in most fields because *Lygus* have continued to feed mostly on squares. Once squares are less plentiful, expect boll damage to increase. Avoid basing control decisions simply on damaged bolls. These populations move in and out of cotton quickly and spraying based on damage may not pay off. Try to base your decision to treat on *Lygus* counts and at this stage in the game, and the appearance of boll damage. When determining damage to bolls, do not base your assessment on external symptoms. If those black sunken lesions do not result in penetration through the carpel wall then neither yield or fiber quality will be impacted. You must open the boll and examine the interior of the carpel wall and lint to determine effective damage. The inner carpal wall will have a small wart and the lock will be stained a light tan color. At this time we do not have strong threshold taking boll damage into account, but Dr. Megha Parajulee is currently working on this.

Black sunken lessons on bolls indicate Lygus feeding

Warts on the inner carpal wall indicates feeding penetration

Successful penetration of the carpal wall by Lygus results in stained lint

Lygus control trial early results

We have been trying to conduct insecticide efficacy tests on field populations of *Lygus*, but thus far we have been able to collect only limited data. If you have a good candidate field and would like to be involved in this sort of research, please contact me. We have however, recently begun a test looking at the residual activity of insecticides to *Lygus*. A graduate student in Dr. Parajulee's program, Abhilash Balachandran, has been conducting this study. In this test we treated cotton with a broadcast application of insecticides and then collected leaves at 0, 3, 7 and 14 days after treatment (DAT) (at this time we have only finished the 0 and 3 DAT sample periods). The treated leaves were brought into the laboratory, placed in Petri dishes with moistened filter paper, and infested with adult *Lygus*. Mortality was assessed at 24 hour intervals following infestation for 5 days.

Ammo, which is considered the standard *Lygus* treatment by many, was killing 80% of the *Lygus* on leaves collected immediately after treatment (click here to view the data). On leaves left on the plant for 3 days, mortality was 100%. Surprisingly, another pyrethroid, Brigade, which has the same active ingredient as Capture and Discipline, did not appear to perform as well as the Ammo at the 0 DAT sample, but for some unknown reason also increased in performance after 3 days in the field. Orthene and Endosulfan were very active at 0 DAT providing 100% mortality, but fell off sharply by 3 DAT, providing 75% mortality at the high rates after the bugs were kept on the leaves for 48 hrs. The high rate of Vydate looked good, still providing 100% mortality at 3 DAT. These data are raw and have not been statistically analyzed, so the numeric differences described may not be valid assessments. In addition to the aforementioned insecticides we also looked at Carbine. Since Carbine does not kill the insects outright, but prevents its feeding, simply basing our evaluation on a 24 or 48 hour exposure would not allow enough time for the bugs to starve and die. Even after 96 hrs of exposure on the 0 DAT leaves, mortality did not exceed 50%, but at 72 hrs of exposure on the 3 DAT leaves mortality was 90% at the high rate of Carbine. It could be that we are not able to adequately evaluate Carbine using this assay method, but at least this test does show that Carbine is slow to kill, although it reportedly inhibits feeding immediately. Why mortality was better for some products after 3 day field exposure is not certain. The *Lygus* adults used for the 3 DAT test may have been older or generally in poorer health than for the 0 DAT test. In the 3 DAT test, we were seeing 19% mortality in the untreated groups at 72 hrs, which suggests less healthy bugs; this needs to be taken into account when assessing true mortality in the individual treatments, so keep this in mind.

Cotton Bollworms

Bollworm numbers have picked up considerably over the past 10 days, although they are very spotty field to field. Some fields have required an insecticide application. With the rapid decline in the aphid population this leaves a lot of beneficial insects looking for something to eat. Besides eating each other we can hope that they instead turn their attention to eating bollworm eggs and larvae, but I would not bet the farm on it. Bollworms need to be scouted for carefully, inspect the terminals, squares, white and pink bloom, bloom tags, and bolls as well. Essentially, to really find all the worms on a plant, you have to do a whole plant inspection. This is especially important on Bollgard I varieties where the Bt titer tends to be lower in the blooms and worms feeding on these may sneak by.

Treatment for may be justified when counts average 10,000 or more small (1/4 inch or less) larvae per acre, or 5,000 larger larvae per acre. However, on cotton that is physiologically behind, you may consider a somewhat lower threshold. DLK

Bollworm feeding on a bloom

Feeding under the bloom tag can be easily missed

Cotton Pests Around the State

Central Blacklands (reported by Marty Jungman, IPM Agent, Hill and McLennan counties)

Cotton is progressing rapidly with the hotter temperatures. Stink bugs are the insect of main concern. There have been a number of fields treated for this pest. There are still some bollworm larvae signs with counts ranging from 0-7 percent. Spider mites and cotton aphid levels are low in most fields.

Rolling Plains (reported by Ed Bynum, IPM Agent, Jones, Mitchell, Nolan, and Scurry counties)

Cotton can be found in all developmental stages. Some fields are just beginning to bloom, others are at peak bloom, and some fields have blooms at the top of the plant. It is amazing how quickly fields have bloomed within the last week to 10 days. Cotton aphids and lepidopteran pests (bollworms and fall armyworms) continue to be a concern. We are beginning to see signs of aphid numbers decreasing in some fields. Parasite mummies and aphids with a fungal disease are more prevalent in fields where aphids have been numerous for 10 to 14 days.

Southern Rolling Plains (reported by Richard Minzenmayer, IPM Agent, Runnels and Tom Green counties)

Cotton has really responded to the hot sunny weather the Concho Valley has experienced over the past couple of weeks. Cotton ranges from 7 nodes above white flower (NAWF) to past physiological cutout with 2 NAWF. Most cotton fields have reached physiological cutout (<5 NAWF) and will need approximately 400 more Heat Units (HU's) to be safe from worms. Currently, we are finding significant number of bollworms and fall armyworms in Widestrike, Bollgard, and Bollgard II cotton fields but they do not seem to be causing significant damage. They are primarily being found in bloom tags and not in squares or larger bolls. About 60% of the population is fall armyworms and the remainder is bollworms. Cotton aphids seem to be increasing in many fields. Natural enemy numbers are very high and hopefully will keep them below threshold levels.

St. Lawrence Valley (reported by Warren Multer, IPM Agent, Glasscock, Reagan, and Upton Counties)

Warm weather has helped cotton progress more rapidly this past week. Cotton ranges from bloom to full sized bolls. Nodes above white flower ranges from 2-8 across area fields. Many

producers continue irrigation and some of the dryland needs more rain. Bollworm activity has dropped off this week; some fields have required treatment while others have slipped by without much damage. Aphids are increasing slightly across area fields. None have reached the economic threshold yet.

Cotton Agronomy

Cotton Crop Update

The High Plains has had about a two-week run of hot, dry weather. Overall, high temperatures for August 1-14 have mostly been above normal (click here to view August temps). Nighttime low temperatures have been somewhat above normal also. For this period of time, Lubbock has accumulated 293 heat units, or about 9% above normal. For the period of May 1 through August 14 at Lubbock, by my math, the overall heat unit accumulation is now 1487 compared to about 1715 for 2004 and 1732 for 2005 (click here to view the Lubbock long-term heat unit accumulation average vs 2007, and here to view the Lubbock long-term heat unit accumulation average vs 2004-07.

Producers have continued irrigation, and fields where irrigation capacity has been adequate are looking somewhat late, but great in many areas. Many dryland fields are moving along toward cutout in some areas. If we could get a good rainfall event across the region, it would be very beneficial to dryland fields. Rainfall chances appear good for the upcoming weekend, and perhaps we can get some timely precipitation. The USDA National Agricultural Statistics Service's crop report for August indicated that we have about 3.2 million acres with about 3 million estimated harvested. District 1 North's estimate was about 600,000 acres, down considerably from the 900,000 acres planted in 2006. District 1 South's estimate was 2.6 million acres, down about 300,000 acres compared to 2006. The overall yield estimate for both districts indicated just under 4 million bales for 2007. We are optimistic that we can have a great finish to the 2007 crop year.

2007 West Texas Agricultural Chemicals Institute Meeting - September 12

The agenda has been set for the West Texas Agricultural Chemicals Institute annual meeting at the Reese Technology Center - Conference Center. I think we have an excellent group of speakers on the agenda. We took advantage of the fact that several outside speakers would be available due to the World Cotton Research Conference being at Lubbock during that week. We were able to get commitments from some excellent speakers from the High Plains as well as other areas of Texas, and other states.

This meeting will provide 8 Texas Department of Agriculture CEUs (1 Laws & Regulations, 2 - Integrated Pest Management, and 5 General. In addition, 8 Certified Crop Adviser CEUs will be offered (1.75 - Nutrient Management, 2.00 - Soil and Water Management, 3.00 - Pest Management, 1.25 - Crop Management). Early registration (if postmarked by September 1) will cost $70/person. Day of Conference registration fees increase to $90/person. Click here for a copy of the program, including the mail-in registration. RKB

Sorghum Insects

Yellow Sugarcane Aphid

The big question this week has been whether to control sugarcane aphid (YSA) on grain sorghum. There are no established economic thresholds for plants beyond the three true leaf stage, so here are some guidelines for older plants such as we have in the field now.

First, YSA injects a toxin into the leaf and the toxin kills tissue. Affected leaves look yellow, and if they are uniformly yellow or discolored throughout, they should be considered dead for purposes of making control decisions. For leaves that are partially killed, add the percentages. For

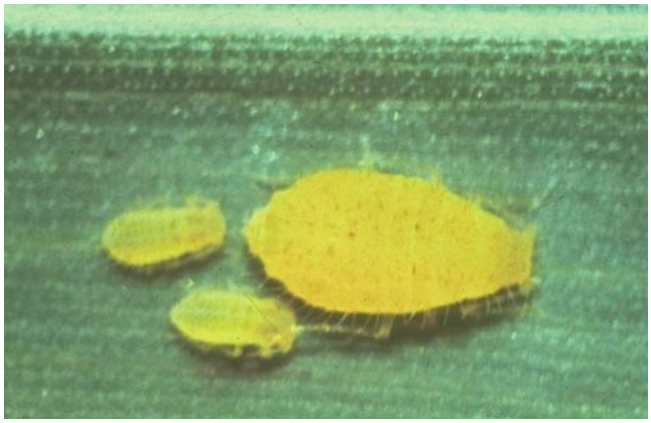
example, if one leaf is 20% dead and two other leaves are 40% dead, count these together as one leaf entirely killed.

When YSA is confined to the lower portions of the plant and not present on the upper portions, we suggest following the economic thresholds for greenbug. For larger plants to the boot stage this would be before any entire leaves on 20% of the plants are killed. From boot to heading this would be at the death of one functional leaf on 20% of the plants. From heading to hard dough this would be the death of two normal-sized leaves on 20% of the plants.

Things get more complicated when YSA is present up and down the plant and not confined mainly to the lower leaves, and unfortunately this is the more common condition this time of year. The upper three leaves on a sorghum plant contribute about 80% of the functional grain yield, so loss of these leaves can seriously affect yield. We don't have any economic thresholds in this situation, but common sense would say to protect the upper three leaves. Greg Cronholm, IPM Agent in Hale and Swisher counties, and the grand old man of sorghum entomology, is suggesting that when 20% or more of the plants in a field have one non-functional leaf in the top three leaves, the threshold has been reached. Partially non-functional leaves should be added together.

We are all accustomed to the high levels of biological control that usually helps keep greenbug numbers in check. The generalist aphid predators such as lady beetle larvae in the field will kill YSA, but the tiny wasps that produce greenbug "mummies" only rarely parasitize YSA. Don't expect any help from the wasps.

A thorough discussion of greenbugs and YSA is presented in our new guide, Managing Insect and Mite Pests of Texas Sorghum, 2007. Insecticide suggestions are included in the guide. It should be noted that many formulations of Dimethoate are now labeled for use AFTER HEADING, and dimethoate is an excellent product for control of YSA and also has activity on spider mites. Be sure to check the label of the dimethoate you are using; not all manufacturers allow use after heading.



Yellow sugarcane aphid adult and nymphs

Sorghum midge

Midge numbers in Lubbock county and elsewhere are higher than in most years, and several fields have been treated. Each female lives only one day but can lay as many as 50 eggs, each of which is placed in a flowering spikelet. Generation time is 14 – 16 days, so midge numbers tend to increase as the season progresses, but tend to drop off in late season. A midge larva prevents kernel formation; one larva is one lost kernel.

Midge only lays eggs in flowering sorghum, which is to say that eggs can be laid on the day that yellow anthers are exposed on the individual spikelet. Sorghum flowers from the top of the head downward over the course of several days, so an individual head may be susceptible for 7 – 9 days until flowering is complete. Individual fields are susceptible during the time of flowering, and a more uniform flowering date is an advantage; the window for potential midge damage is shorter.

The new version of Managing Insect and Mite Pests of Texas Sorghum does an excellent job of explaining how to scout for midge, and it lists economic thresholds. I won't repeat this information here. Sorghum midge insecticides are targeted at adults in order to prevent them from laying eggs.

Sorghum midge adult

It is also time to scout for sorghum headworms. This is a complex of caterpillars that feed on sorghum heads, and is usually comprised of cotton bollworm, fall armyworm, and occasionally other species as well. RPP

Sorghum Agronomy

Irrigation Termination

When can I stop irrigating grain sorghum? As a rule of thumb if good soil moisture is still available to the plant—at least 1-2"—then terminate near soft dough. The sorghum seed will proceed through grain development from watery ripe to milky ripe to mealy ripe, then begins to firm at soft dough on to hard dough. Physiological maturity occurs at black layer; the appearance of a black dot on the tip of the seed. Under warm conditions this usually occurs about 10-12 days after soft dough. Overall, grain sorghum usually takes about 30-35 days from flowering to reach physiological maturity.

Seed moisture at black layer is ~25-35%, but harvest must be below 20% moisture with drying required. Grain can be harvested without drying at 13 to 14% grain moisture to avoid dockage (depending on delivery point).

Can Desiccants Be Used for Grain Sorghum?

This question comes from time to time. There is no consistent use of desiccants for grain sorghum, which may enable earlier harvest. In the South Plains the most frequent situation where drying the crop down quicker may be of value would be for fields that have put out a lot of sucker tillers (e.g., a lot of green fodder is going to delay timely harvest) from the top nodes on the grain sorghum or for seed production fields. In the former case this has, in my experience, most likely been dryland fields that don't merit the added cost unless the primary heads have good yield. Sometimes these sucker heads, however, can delay harvest by 4 weeks.

Birds in Grain Sorghum

Blackbirds are feasting on grain sorghum in some areas this year, particularly where they have nearby roosting spots, permanent water such as playa lakes, and near towns. There have never been reliable long-term effective control measures for this problem.

Propane guns, screechers, etc. just don't seem to be effective very long even on small areas let alone large fields. One avicide, Avitrol, is labeled for bird control, but involves quite a bit of work to use on large fields (treat grain like corn, spread around fields, etc.). The bottom line after all the effort is; did it help? You have to be a licensed applicator to use Avitrol. The bird repellant BirdShield has been minimally effective for short periods of time in some trials (but not all). At $94/gallon chemical cost to cover 8 acres, the benefits are probably minimal at best. BirdShield might offer some protection for a week or so, but the duration of protection needed in many fields is 3-4 weeks.

So what is the best way to avoid blackbird damage? Perhaps shotguns and teenagers with time on their hands and an ATV to drive around. Once you see the pattern of the birds and what time of the day they tend to come to your field then be there to greet them. CT

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