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FOCUS on South Plains Agriculture

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Cotton Insects
Lygus increasing
Late, dryland cotton
Bollworms; possible increase in resistance

Cotton Agronomy
Crop update
Tracking NAWF and cutout date
August and September meetings

Cotton Disease Update
Verticillium wilt
Bacterial blight
Other disease observations

Corn and Sorghum Insects
Mite threat variable
Headworms active in some places
Insect trap counts through Aug. 5th

Regional alfalfa workshop
Friday, August 14th

Cotton Insects

Lygus

Lygus can found in low numbers in cotton throughout the region, although populations tend to be more prevalent as you move north. Cotton north of Lubbock needs to be checked carefully for Lygus. There have been a number of fields treated for Lygus in Hale, Swisher and Castro Counties. Pay particular attention to fields adjacent to alfalfa or recently disturbed weedy areas. Additionally, pay attention to cotton that is attractive to Lygus for colonization. The cotton that tends be most attractive to Lygus are the high input fields with growthy cotton shading the middles. This type of habitat is most profound in 30-inch or narrower rows. Lygus like good cover and typically will not readily colonize short, open canopied cotton.

At this point in the season, the best technique for sampling Lygus is with a drop cloth. Preferentially, black drop cloths work better than white ones since small light colored insects such as Lygus nymphs show up better on the black drop cloths. Simply place the drop cloth between the rows and vigorously shake and beat about 1.5 row-ft for each side onto the drop cloth and then quickly inspect the cloth. Most adult Lygus will be stunned, but watch for those able to quickly fly. Two drop cloth samples constitute a single sample unit. Take at least four sample units or eight drop cloth samples per field side. If the total number of Lygus equals or exceeds 4 per 6 row-ft (2 per drop cloth sample); then an insecticide application is justified.

AgriLIFE EXTENSION
Texas A&M System

From top to bottom, a 1st instar, 4th instar and adult Lygus

Don't be in too big of a hurry to spray populations composed primarily of adults. Most of the situations I have seen where the population was primarily adults have not resulted significant damage. For the most part the adults appear to be coming in, laying eggs and leaving within 2-3 days; they do not appear to be doing much feeding. However, if you have growthy cotton that is shading the middles, they may want to stay and, in that scenario, an insecticide application may be justified if at threshold. Once you begin to pick up predominately nymphs, be careful. It is at this point where high levels of damage can occur.

For the most part, Lygus on the Texas High Plains are fairly easy to control with the right insecticide, unlike other parts of the U.S cotton belt where insecticide resistance is an issue. Last year we conducted several Lygus management tests looking at Carbine, Ammo, Orthene, Vydate, Centric and Diamond. All of these products have some Lygus activity, although based on our data, Centric appears to be a little weak. Syngenta, the company that produces Centric, does not recommend Centric for Lygus control on the Texas High Plains. If you use a pyrethroid, such as Ammo, Orthene or Vydate, you can expect an immediate kill, while Carbine and Diamond act more slowly. Carbine is an anti-feedent, so the insect will essentially have to starve to death which may take up to 5 days depending on temperature. Diamond is an insect growth regulator and will only express activity on Lygus nymphs; it will not kill the adults. Thus, if you have a Lygus population composed primarily of adults, Diamond is probably not your best choice. Similar to Carbine, Diamond may take 3-5 days to kill the Lygus; death from this product occurs during the molting process.

2008 Lygus test results

- 0 DAT
- 3 DAT
- 7 DAT
- 13 DAT

One thing to be wary of when selecting a product for Lygus control is it impact on beneficial insects and the likelihood of flaring a secondary pests such as aphids. Of the products we looked at in 2008, Carbine and Diamond are least likely to cause secondary pest outbreaks. Both of these products are easy on beneficials. Also, Carbine has good aphid activity while Diamond has good activity on armyworms.

Late, Dryland Cotton

With the timely rains we have had over the past month, where we were able to get a dryland crop up, it is looking good. However, much of this crop is very late and a lot of it is just now heading into bloom. As good as it looks we simply do not have a great deal of time to turn these blooms into mature bolls, especially as we go north. The boll maturation period from a white flower to a fully mature boll requires about 850 DD60s (heat units). Although accumulation of 750 DD60s will produce an acceptable boll, these bolls may be slightly lighter and may suffer some mic reduction. By mid-August we may have a difficult time finding the necessary heat units to fully mature a boll, thus we need to concentrate on hanging onto the bolls we produce over the next few weeks. These bolls will likely be our highest yielding and highest quality bolls, and the loss of these bolls could be devastating. We need to be paying very close attention to insect pests in this dryland crop, and bollworms are our biggest threat.

Bollworms

Scattered bollworms are still being picked up, although populations are fairly low. I expect numbers to increase substantially in the non-Bt cotton over the next 2-4 weeks. Good coverage is essential for good control of bollworms, and this can be difficult to achieve in growthy cotton. If treating a growthy field, use a ground rig if possible. If you can't get a ground rig in the field and you have to go out by air, try to use a spray volume of at least 5 gallons and consider using a higher rate of the pyrethroid. If treating a field with bollworms greater than ¼ inch in size, again, use a ground sprayer if possible and higher rates.

Dr. Patricia Pietrantonio, Texas A&M University, has been conducting a pyrethroid resistance monitoring program for a number of years. Based on her data, historically, bollworms on the Texas High Plains have not expressed resistance to pyrethroids. However, recent bioassays from bollworm moths collected by Blayne Reed, Reed Consulting, in Swisher County indicate that some low levels of resistance may be present. More data is going to be required to confirm this. Keep in mind that insecticide resistance is not like pregnancy; it is not an all or nothing type deal. Often you can have low to moderate levels of resistance and still be able to kill the worm with the product in question; it's a question of dose and getting the insecticide to the insect at a lethal dose. Control difficulties on insects with low levels of resistance usually occur where we are using too low of an insecticide rate, or we are having trouble penetrating the plant canopy and are essentially unable to deliver a high enough rate where the insect is residing. If you think you may be dealing with bollworms with low levels of pyrethroid resistance, use higher rates and maximize coverage. That being said, there is interest from area consultants in alternatives to pyrethroids for bollworm control. Although I have limited data, Belt and Coragen may prove to be viable pyrethroid alternatives. Both of these products are extremely efficacious towards beet and fall armyworms, and although not as hot against bollworm, do appear to have good activity. If you choose to try one of these products for bollworms in cotton, be aware that they are slower acting than the pyrethroids. These products are muscle poisons and paralyze the worm, but do not kill it outright. It may take 3-7 days for the worms to die depending on temperature, but during that time the poisoned worms will not be feeding. Additionally, if coverage is an issue with a pyrethroid, coverage may also be an issue with these products. But unlike the pyrethoids, these products are translaminar and will move into the plant tissue which may help alleviate

some coverage problems. However, they will not move from where they landed to another portion of the plant. An additional benefit from using Belt or Coragen instead of a pyrethroid would be the reduced impact on beneficials. Whereas pyrethroids are extremely hard on insect predators and parasitoids, both of these products are easy on beneficials and thus less likely to flare secondary pests such as aphids. Preserving the predators will also help manage those bollworms currently being targeted as well as new hatches. DLK

Cotton Agronomy

Crop Update

The High Plains crop continues to make good to excellent progress. Rainfall obtained in the last half of July in many areas has provided additional optimism for many producers. Some timely rainfall events over the last weeks have resulted in continued progress. Recently, daytime highs have been very hot although, we did encounter a "record low high temperature" at Lubbock of only 73 degrees. The month of July ended with 655 heat units at Lubbock, which is about 6% above normal (Click here to view July temperature slide). Heat unit accumulation for the first six days of August reflect the above normal daytime temperatures and is about 19% above normal. If we could get some good rainfall on our crop it would be very beneficial with yield potential for most of the irrigated crop and dryland.

I had a chance to look at some of the later emerging dryland (which was dry planted in late May/early June and came up after the June 20 rainfall events) in Lynn County last Friday. That cotton looked excellent, with the exception of having only one-third grown squares. It is likely that much of this cotton will not bloom until about mid-August, which is near our "COTMAN physiological cutout date" for Lubbock based on a 50% probability of obtaining an additional 850 heat units for a mature boll. This is very concerning to me. However, if we get some good rainfall and continue with a warm to hot September and early October, we still may yet have some good potential on many of these late emerging dryland fields. The irrigated crop is progressing nicely, and many of the fields I have seen have been running from cutout (less than 5 nodes above white flower or NAWF) to up to 9. Some producers south and west of Lubbock are indicating that they have an excellent irrigated crop out there. Although the FSA crop certification date has been moved to August 15 this year, we are still reasonably confident that we have lost around 600,000 acres out of the system, and this is fairly well supported by Texas Boll Weevil Eradication numbers. Most of these failed acres are dryland, with some irrigated. However, recent thunderstorms have wreaked havoc in some counties. Hale County received some rainfall and hail a little over a week ago and a few thousand acres were lost. The southern Lynn/northern Dawson counties area had a few thousand acres lost, much of that being some of the earliest emerging dryland in the High Plains. We should have a much better idea of actual planted and failed acres from in another couple of weeks.

Tracking NAWF and Cutout Date

With the rough start to the 2009 High Plains crop, we are hoping for a much better finish. The dryland struggled due to lack of rainfall, and then finally in late June many dryland areas received substantial moisture. What this means is that we will have a sizeable acreage of late dryland. Of course, we will still need to have some timely rains to help us out. Although we lost a few acres due to various meteorological events, the irrigated crop is pretty much intact. It was planted fairly timely, but due to a cool spell at the end of May, crop development lagged somewhat. This indicates that we will once again need to squeeze as much growing season as possible for a lot of our irrigated fields. Thoughts concerning end of season management inspire me to encourage producers to consider the following. I really like to track nodes above white

flower (NAWF) and the date where we reach "hard cutout." I define that as the date the crop reaches less than 4-5 followed by "blooming out the top." We can sometimes see irrigated crops stay around 5 NAWF for 2-3 weeks depending upon irrigation capacity and rainfall events. What we're interested in here is the date when the crop drops below 4-5 and then goes to zero in a few more days. Based on long-term temperature data at Lubbock, we can still get about 850 heat units past this if it occurs before about August 15. Recording and then tracking heat units past this date can be beneficial, as many management considerations can be triggered using COTMAN. Insecticide terminations for Lygus and bollworm egg lay can be considered beginning at approximately 350 heat units after this date. Irrigation termination certainly varies from field to field based upon soil profile moisture and even with the type of system (drip vs. pivot or furrow) and boll load. Based on irrigation termination work conducted in Texas, producers should look seriously at using about 500 heat units past cutout. Along with the three usual crop termination decision techniques (percent open bolls, sharp knife technique to observe seed maturity in unopened bolls, nodes above cracked boll method), the 850 heat units past cutout crop landmark can also be a good tool for harvest aid application consideration. Here is a graphic to better understand how to determine NAWF.

August and September Meetings

We have begun the crop tour part of the growing season. I have several tours/ meetings on my calendar. Here is what I have at this time:

- **Dawson County** Ag Tour, August 12
- **Bailey County** Crop Tour, August 25
- **Texas AgriLife Research** Subsurface Drip Irrigation Field Day, Helms Farm - Halfway, August 25
- **Martin County** Crop Tour, September 1
- **Carson/Gray Counties** Cotton Tour, September 2
- **Moore/Sherman Counties** Cotton Tour, September 3
- **Terry County** Cotton Tour, September 4
- **Yoakum County** Farm Tour, September 9
- **Crosby County** Crop Tour, September 10
- **Lamb County** Crop Tour and Harvest Aid meeting, September 11
- **Cochran County** Crop Tour, September 15
- **Lynn County** Ag Tour, September 16

West Texas Agricultural Chemicals Institute Annual Meeting, September 16. There is another excellent program planned. Visit the conference website to see the program and register to attend. We really appreciate our IT guy at the Lubbock Center assisting with handling the Web site issues. Thanks David Pointer!

Lubbock Center Centennial, September 17 Our Texas AgriLife Research colleagues have planned a centennial celebration. The original Lubbock Experiment Station was established in 1909. I will provide more on this later. One can visit the Centennial Celebration Web site. RKB

Cotton Disease Update

Verticillium wilt

Verticillium wilt (caused by *Verticillium dahliae*) is quite evident in many fields throughout the region. Observations in research trials, conducted by Dr. Terry Wheeler, show disease incidence greater than 60%. Onset of the disease is similar to what has been experienced over the past few years. Dr. Wheeler's results indicate that disease development is greatest in fields with extremely high soil levels of the fungus; whereas, fields with low to moderate soil levels are not progressing as quick. Data being collected this season will be analyzed and summarized in time for producers to make decisions for next season. See the July 10, 2009 issue of FOCUS for additional information on Verticillium wilt.

We will continue to keep you up to date on this disease as the season progresses.

Bacterial blight

In addition to Verticillium wilt, I have received several calls regarding Bacterial blight, also known as Angular leaf spot (caused by *Xanthomonas axonopodis* pv. *malvacearum*). The majority of these calls are coming from the Dawson County area, and portions of the Rolling Plains to the east. Although sporadic, this disease is observed on an annual basis. Bacterial blight is more severe when abundant rainfall and high relative humidity are experienced. Initial symptoms appear as water-soaked lesions on the lower leaf surface.

As the disease progresses lesions can be seen on the upper leaf surface. These have a red to brown border and are restricted to the veins. Leaf lesions have a distinct water-soaked appearance. The disease may progress up the petiole resulting in what is known as black arm. Losses due to Bacterial blight are generally low (<10%); however, reductions over 50% have been reported in other areas. Yield loss is due to premature defoliation. In addition, lesions can develop on bolls and lint from infected bolls will be stained.

The bacterium can survive on the seed coat, thus infected fields should not be used for seed blocks. There are no in-season management options for bacterial blight. The applications of growth regulators to prevent rank growth may impact disease development by increasing the amount of airflow in the canopy. Spread of the disease can be limited by restricting movement of equipment in and out of infected fields. Shredding and the incorporation of infested debris after harvest is also advised to minimize the potential for disease development in the future. Fields with a history of bacterial blight should be planted to a resistant variety. Results from screening trials are available on our website.

Other disease observations

A few cases of Alternaria stem blight (caused by *Alternaria macrospora*) have been

reported throughout the area. This disease resembles a lightning strike. Initial infections occur on the leaf margin and exhibit a distinct purple discoloration. As the diseases progresses, this discoloration becomes apparent on the mid-rib, continuing down the petiole, into the stem. Infected stems become necrotic, and the terminals have a curved appearance.

Microscopic characteristics of A. macrospora

Overall, *A. macrospora* is considered a weak pathogen, and typically requires some form of stress for the disease to develop. While Alternaria stem blight is a minor disease, the increasing frequency of infected fields should be monitored. I have also received samples from and visited fields that are exhibiting symptoms similar to those of Alternaria blight. *Alternaria macrospora* is absent from these samples. Close examination of these plants has revealed two different maladies that may be contributing to the symptoms we are seeing. Galls have been observed on the tip of the taproot of plants from Hale County. These galls range in size from a dime to the size of a quarter. I have also received samples from off the Caprock (Collingsworth County), where the upper stem has collapsed. Abnormal shaped tissues have been found in several plants exhibiting these symptoms. Oklahoma State University Cotton Agronomist J.C. Banks has contacted me regarding several fields around the Altus, OK area with similar symptoms. We are conducting laboratory assays to try and identify what is causing these problems, and will let you know what we find out. If you are experiencing any of the aforementioned diseases, or have questions regarding any other cotton diseases, please feel free to contact

Jason Woodward, via e-mail at jewoodward@ag.tamu.edu, or telephone 806-632-0762. JW

Corn and Sorghum Insects

Spider mite numbers in corn are either increasing or decreasing depending on the field. There is no clear pattern to this except to say that with the return of hot, dry weather mites can increase rapidly in corn, especially later corn that is tasseling. I should also mention that some corn fields received pyethroid applications within the last few weeks, and many of these fields now have serious mite problems. I have seen six-spotted thrips in many fields that did not get a pyrethroid application. I have not yet seen neozygites, the fungal pathogen that can wipe out mites in a matter of days. This pathogen is usually favored by humid weather, and of course we don't have any of that right now.

The big fall armyworm flight that we were expecting has yet to materialize. In fact, trap captures were down this week. Corn earworm trap captures were up slightly this week. Brant Baugh, IPM Agent in Lubbock County, is reporting that several sorghum fields have needed a headworm insecticide application. Brant was quick to say that many fields are far from reaching threshold. Each field must be scouted. Corn earworm is far more common on heads than is fall armyworm. If you read David's statements about possible pyrethroid resistance in cotton bollworm (above) then you saw the part about increased rates and good coverage. The good news for sorghum headworm control is that coverage will be excellent because there is no foliage to intercept the insecticide. That being said, if we do have increased resistance in bollworm (corn earworm, sorghum headworm) this would not be a good time to cut rates for headworm control. RPP

Trap Captures as of August 5th

- Cotton bollworm Lubbock Co.
- Beet armyworm Lubbock Co.
- Fall armyworm Lubbock Co.
- Southwestern corn borer Lubbock Co.

- Fall armyworm Hale Co.
- Southwestern corn borer Hale Co.

Regional Alfalfa Workshop

Alfalfa producers can update their alfalfa production expertise at an upcoming alfalfa production workshop, Friday, August 14, near Lubbock. The workshop is sponsored by Texas AgriLife Extension Service, and begins with registration at 8:30 AM, with the program concluding by 12:30 PM. The meeting will convene at the Texas Boys Ranch northeast of Lubbock, and include a local field visit. From U.S. 62/82 about 1.5 miles northeast of Loop 289 turn north 2 miles on CR 2800 or if coming from I-27, exit to FM 1294 (Exit 11), then ~5 miles east to Liberty Gin, then south 3.5 miles on CR 2800. Workshop topics include fall planting, irrigation requirements, variety selection, as well as insect and weed control. The program will conclude with a visit to a drip irrigation alfalfa field north of Idalou.

Registration is $20 which includes an alfalfa crop production book. 3.0 CEUs are available. For further information contact the Lubbock County office of Texas AgriLife Extension, (806) 775-1680, or Calvin Trostle, Extension agronomist, Lubbock, (806) 746-6101, ctrostle@ag.tamu.edu. CT

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