FOCUS on South Plains Agriculture

Texas AgriLife Research and Extension Center at Lubbock
1102 E. FM 1294, Lubbock, Texas 79403

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Editors' Note

The storms last weekend knocked out power to the Lubbock Center for quite a while. As a result, our servers went down and FOCUS was unavailable for the weekend. We would like to apologize for the inconvenience.

Also, the same power outage has affected some of the weather data on the High Plains ET Network. The people that run the ET network are pulling backup data from an offsite backup server, and they expect to have data for August 16 - 19 restored in the near future.

Cotton Insects

Not much has changed from last week on the insect front. Beet armyworms are still common in many non-Bt cotton fields, and there have been inconsistent incidences of bollworms as well. Where pyrethroids have been used for bollworm control, aphids have flared in a few fields but most populations are below threshold. For more information regarding beet armyworms, bollworms and aphids, please refer to the August 15 issue of FOCUS.

Lygus

We are encountering Lygus more and more frequently, but most populations are below threshold. However, I have seen cotton with populations as high as 12 Lygus per 6 row feet, which is 3X the threshold. The highest Lygus populations we are currently seeing appear to be primarily in Lubbock and Hockley counties, but we are finding Lygus to some degree just about

everywhere north of Yoakum, Terry and Lynn counties. Additionally, Lygus tend to be highest in cotton located near alfalfa or recently plowed fields of weeds. This is no surprise. If you have cotton situated in this sort of habitat, you should scout it carefully; see last week's edition of FOCUS for more information on scouting for Lygus, damage and identification. Lygus also tend to be most prevalent in taller, ranker cotton, especially if planted on 30-inch rows. Lygus like cover and are more likely to colonize growthy cotton. The highest population I have observed was in cotton that was about waist high. Additionally, the populations of Lygus that were above or approaching threshold all were comprised of predominately nymphs. I suspect that these fields were infested from recently cut alfalfa or plowed weeds, and the Lygus adults moved into the cotton in sub-economically damaging levels, but colonized, and now we are see the results of the egg lay.

Which fruit are at risk from Lygus damage?

Lygus will feed on both squares and bolls, but at this point in the season we are not too concerned with square damage, it's the boll damage we need to watch for. Fruit susceptibility is size of fruit and size of Lygus dependent. For instance, research has shown that 1st-3rd instar Lygus are not capable of feeding on the anther sacs of large squares (those over 0.3-inch in diameter). Regarding boll susceptibility, data is currently limited but Dr. Megha Parajulee's lab is working on this matter. However, I would suspect that the larger the boll, the less susceptible it is to feeding, especially to small nymphs. We do know that once a boll accumulates about 350 heat units (which is a boll about 1-inch in diameter), it is no longer considered susceptible to Lygus damage. So essentially we need to protect bolls that are 1-inch in diameter or smaller.

Dark specking is a symptom of Lygus feeding on a boll

Lygus damaged bolls will have small, dark, sunken lesions on them. Each spot represents where the Lygus' mouthparts penetrated into the carpal wall. Just because you find Lygus stings on a boll doesn't necessarily mean you have sustained damage. Small Lygus may be incapable of fully penetrating the carpal wall, or the Lygus may have simply been superficially probing. To determine if a boll is damaged you will need to dissect it with a knife. If the Lygus penetrated the carpal wall you will see a spot on the inside of the wall and stained lint.

Darkened lint at a Lygus feeding site indicates successful carpal wall penetration and feeding

When a boll is internally damaged, the lock may not develop properly and may be stained or have other quality issues. Small bolls that are fed upon will sometimes be aborted by the plant, especially if the boll has multiple feeding sites on it.

What control options are available for Lygus?

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. Refer to the AgriLife Extension publication E-6A for a listing of insecticides currently recommended for Lygus control.

We are currently conducting research on insecticide efficacy on Lygus. In one test, we are working with a sub-threshold population of Lygus that had become somewhat of a chronic problem due to the length of time of the infestation. In this test we evaluated Ammo, Carbine, Centric, Diamond, Orthene and Vydate. Just prior to insecticide application the total number of Lygus were running between 1.5 and 3.25 per 6 row-ft; below threshold. Click here to view 0 DAT data. The population was predominantly nymphs, and most of these nymphs were 1st and 2nd instars. At 2 DAT we were able to see differences among treatments for nymphs and for total Lygus (nymphs + adults). All of the insecticides had statistically fewer nymphs (indicated by blue lettering on the graph) than the untreated, and fewer total Lygus (indicated by black lettering). Click here to view 2 DAT data. At this time Vydate had fewer total Lygus than Diamond, but neither of these treatments statistically differed from the other insecticides. Carbine and Diamond were both expected to act slowly. Carbine is an antifeedent and requires time for the insect to starve to death, and Diamond is a growth regulator requiring a molt to induce mortality. Since most the Lygus in this test were very small, Carbine and Diamond may have been faster acting than expected, but don't expect this fast of a response on larger Lygus, and do not expect Diamond to kill adult Lygus at all. Vydate was the only treatment to "zero" the population out at 2 days. At 1 week following the insecticide application, the entire Lygus population had declined somewhat and adult Lygus were becoming more numerous. We did not detect any differences among the treatments in the number of adult Lygus or total Lygus, but we did for the number of nymphs. Click here to view 7 DAT data. Adult Lygus are highly mobile and were undoubtedly moving into the test plots and from plot to plot. This sort of behavior makes evaluating insecticides on adults very difficult and usually unreliable. However, the nymph numbers should be a good indicator of insecticide activity, and at this time all of the treatments were performing equally well statistically. Similar to the 2 DAT evaluation, Vydate was the only treatment to have zero nymphs at 7 DAT. Since the Lygus population in this test was low (below threshold), similar results may not occur on a higher infestation. However, we have another test that has a much higher Lygus population, and I hope to report on it in the coming weeks. DLK

Cotton Agronomy

Overview of Week

Considerable amounts of very welcomed rainfall have been received across the region. Amounts ranged from around an inch to over 6 inches in the northwestern areas of the South Plains. Deaf Smith County also received some severe hail with numerous acres of crops lost in that area. Here at Lubbock, we are up to nearly 3.5 inches of rainfall for August. Click here to view August precipitation. Although the rainfall will considerably help some irrigated fields, in my estimation it was somewhat late for much of our dryland cotton. The previous three weeks or so of no rainfall really took a toll on dryland and marginally irrigated cotton. A considerable

amount of acres reached cutout prior to our recent rainfall. Well irrigated cotton still looks very good and has made great progress. The cooler temperatures over the last several days resulted in cotton heat unit accumulation taking a dive, and the highest daytime high temperature from the 15th through the 20th was about 82 degrees. Three days during that timeframe reached highs of only 77 degrees at Lubbock. Click here to view August temperatures. This resulted in about two-thirds of normal heat unit accumulation for that time period. For the month of August, which started out very warm, we are now about 5% below normal. From May 1 through August 20th, heat units now total just under 1900, which is about 5% above the long term average. Click here to view accumulated heat units. We need to be hitting cutout in well watered fields soon in order to obtain good maturity of late set bolls based on historical weather "norms." Where rainfall amounts were around one inch or so, producers are attempting to stay ahead of the game by turning pivots back on in fields with excellent boll loads. Extended forecasts indicate a rapid warming trend for a few days, then somewhat cooler than normal temperatures. I suspect that with the significant cool spell we had verticillium wilt symptomology will again become pronounced.

Irrigation Termination

The 2008 growing season has resulted in exorbitant irrigation expenses for many producers. Some fields are now entering cutout. In any given field, the last irrigation will be dependent on seasonal conditions, soil type and the irrigation system being utilized. Ideally, the last irrigation should provide just enough plant available moisture to retain and mature all the bolls that have a reasonable chance of producing lint of acceptable quality under normal growing conditions.

Based on historical long term seasonal conditions at Lubbock, blooms set on August 10 have a 100 percent probability of producing a **fully mature cotton boll** whereas blooms set on August 15 and 25 and September 1, respectively, have only 71, 29 and 14 percent respectively, chance of reaching maturity. More recently, with the warmer growing seasons experienced in some years, and especially in the southern counties in the High Plains, these final bloom dates have been pushed somewhat later into August. Normally a boll will be retained once it reaches 10 -14 days after bloom. The goal is to avoid excessive moisture stress at least until the final bloom to be taken to the gin becomes about a 10-14 day old boll. This will reduce the likelihood of small bolls shedding due to water stress. After that, late bolls can handle more stress. For a boll set on August 10th, excessive moisture stress should be avoided at least through the end of the month, unless rainfall can offset irrigation requirement.

Approaching the boll opening stage of cotton, the crop coefficient decreases from about 1.0 at first open boll to about 0.8 at 30 percent open bolls and it decreases rapidly after that. If reference ET is averaging 0.25 inches per day, and the crop coefficient is 1.0, then at first open boll the crop ET is 0.25 inches/day (0.25 x 1.0) or 1.75 inches per week. As the crop approaches boll opening phase, if reference ET is averaging 0.25 inches per day, the crop will use about 1.4 inches per week (0.25 x 0.8 x 7 days). A rod probe, soil water monitoring equipment, or other tools may be useful to determine the amount of moisture remaining in profiles in fields. Estimated water holding capacities of some major High Plains soils are found in Table 1.

Irrigation System Suggestions

In the High Plains, furrow irrigation applications that bring soil moisture levels to near field capacity should be terminated by mid-August. There is considerable management utility in using deficit irrigation with center pivots and SDI to apply small amounts of water extended into early September as needed to minimize fruit shed. Because of highly controlled irrigation amounts in center pivot or SDI, producers may need to "wean

off" high yielding fields and not terminate completely at that time. With center pivots and SDI, low amounts of irrigation can be applied if the cotton is severely stressed after initial termination. If the amount of wilting is unsuitable for the boll load, then the pivot can be passed over the field or drip applications may be made to apply additional water. These amounts could be as small as 0.75 to 1 inch per week depending upon profile moisture and crop conditions. Click here to view irrigation deficit replacement values based on irrigation capacity.

In many years the value of continued center pivot irrigation and SDI after bolls begin to open is probably questionable, unless extremely high temperatures and high ET are encountered and the field has a depleted moisture profile and a late boll load. Generally, we observe about 2-5 percent boll opening per day once bolls begin to open. This implies that if the last irrigation is made at a few percent open bolls, then it should take about 10 days to reach 30-60 percent open bolls. Research projects addressing these issues are underway. Preliminary results of a 2007 project indicate that untimely early irrigation termination significantly reduces yields. Click here to view water holding capacity of various High Plains soil types.

Using Plant Mapping/COTMAN

When using the COTMAN program funded by Cotton Incorporated and developed by the University of Arkansas, various investigators across the Cotton Belt have noted that irrigation termination at about 400600 DD60 heat units past cutout (here defined as Nodes Above White Flower or NAWF = 5 on a steep decline) has been reasonable in some areas. One lowyielding trial (about a bale/acre) conducted by Extension IPM agents at the AGCARES facility at Lamesa in 2003 indicated 600 DD60s optimized yield and net returns from LEPA irrigation. A SDI project conducted on 1100 lb per acre cotton in the St. Lawrence area indicated that **untimely early** termination based on heat units past cutout resulted in yield losses. **However, it was concluded that few benefits were noted by extending SDI irrigation past 500 HU after NAWF = 5.** Most of the project reports published in the Beltwide Cotton Conference Proceedings and other publications lacked information on soil profile moisture status in the trials at the time the irrigation was terminated. We suggest producers use this only as a guide.

Increasing Harvest Aid Efficacy

A good target would be to have the soil profile nearly depleted as harvest aid season begins. First, this reduces excessive pumping for unnecessary water applications, and second the moisture stress can actually aid in establishing a physiological state that results in some older leaf shed. Cotton generally responds better to harvest aid application when there is some moisture stress on the plants. If excessive moisture is available, defoliation of some varieties becomes more difficult, as is often encountered in years when substantial late rainfall occurs.

September Meetings/Tours/Industry Field Days

Although crop tours have begun, we still have several on the calendar. Also, industry field days may also be of interest. Here are the ones of which I am aware. For specific information, call Extension agents or industry representatives for more details. RKB

Alfalfa Agronomy

Alfalfa Questions Answered

Numerous alfalfa resources for agronomy, fertility, stand establishment, and weed control for the Texas High Plains are available on the web at http://lubbock.tamu.edu/othercrops Or if you pre-

fer, new editions of Extension's 'Alfalfa Crop Book' for the Texas High Plains have been prepared and are available for $20, including mailing (contact Calvin Trostle, 806.746.6101, ctrostle@ag.tamu.edu).

Here are key tips for establishing new alfalfa stands in the Texas High Plains:

1) Fitting land area to irrigation capacity. In the past 7 years or so, this is usually the first question that arises when producers call about putting in alfalfa. A simple formula on page 5 in the Extension's 'Texas Alfalfa Production', helps calculate an approximate acreage for alfalfa given your irrigation capacity. Most often this calculation reduces the acreage that a producer expected to seed. Generally the formula sets targeted irrigation capacity near 9 gallons per minute per acre.

2) Firm seed beds ease establishment and seeding. The rule of thumb is that when you walk across an alfalfa field for seeding, the heel of your shoe should sink no more than 3/8" into the soil.

3) Alfalfa variety selection and seed cost. Though variety trial data from New Mexico and Oklahoma note many varieties with consistent performance, in general there is not a great deal of difference in yield among most varieties. I believe your management (stand establishment, fertility, maintaining your stand, harvest timing, scouting and spraying for insects like alfalfa weevil, cowpea aphid, worms, etc.) will have a greater impact on your overall success. Producers will find that alfalfa seed costs may range from about $2.50-4.50 per pound, but at 20 lbs. per acre and prorated over four years, producing as little as an extra 100-200 lbs. of alfalfa per acre per year will pay for higher cost seed. I do recommend that producers avoid 'common' or VNS seed and any other seed that is not treated with *Rhizobium* inoculant or a seed fungicide.

In general, planted Fall Dormancy (FD) ratings for alfalfa in the Texas South Plains should focus on FD 4 & 5 and perhaps 6 for the northwest South Plains, 5 & 6 and perhaps 7 for the central and lower South Plains. Seeding less dormant alfalfa (higher FD number, which greens up earlier and in theory producers longer into the fall) does not ensure that you will yield more alfalfa, and it can open you up to potentially more insect problems, shorter stand life, etc.

4) P fertility. Phosphorus is an important nutrient for alfalfa as each ton of alfalfa removes 12-14 lbs. of P_2O_5 per acre. Thus a seven ton alfalfa crop is removing 90 lbs. of P_2O_5 per acre per year. Now multiply that by 4 or 5 years. We know that P is immobile in the soil. Surface applied P to an existing alfalfa stand is tough to get into the root zone where it is needed. Hence I believe that producers should consider applying at least 2 years worth of P up front when it can be incorporated into the soil. Ideally we would knife the P in (rather than broadcast then incorporate) to further increase availability over time, especially if we could band the P at 15" centers or less.

5) Soil testing. Alfalfa is as expensive a crop to produce, and has a high nutrient demand for macronutrients (N which should largely come from *Rhizobium* fixation, P, K, S). Although soils in West Texas are inherently high in potassium (K), levels can be drawn down in alfalfa production. Soil testing is a good bet for alfalfa as much as any other crop we grow in West Texas. CT

Canola Agronomy

USDA Further Funds Winter Canola Research for West Texas, New Mexico

USDA has granted additional funds for canola research in the Southern High Plains. This project will implement variety, irrigation, and agronomic testing as well as forage trials to evaluate

the adaptation of winter canola in the region. Canola is an oilseed crop that produces excellent food grade oil which is also the preferred oil for making biodiesel.

Canola plantings in the region should be targeted from early September in the Panhandle to mid-September in the South Plains. As we saw in tests in 2007, canola planted near October 1 in Hale Co. demonstrated reduced growth, and plantings in mid-October died due to lack of root and crown establishment prior to the onset of cold temperatures.

Some winter canola varieties are Roundup Ready. This will give wheat producers an option in the future to address pesky winter weed problems. Currently there are no delivery points in the Texas High Plains, but that may change due to the growth of canola in western Oklahoma.

Relevant canola production resources of use for the Texas High Plains are found at http://www.canola.okstate.edu/ If you or someone you know is interested in canola or has a field anywhere in West Texas or New Mexico in 2008 please contact Calvin Trostle. I would like to follow these fields through the coming season and compare production tips. CT

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Editors

Michelle Coffman, Associate Editor
David Kerns and Patrick Porter, Co-editors

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Contributing Authors

Randy Boman, Extension Agronomist
David Kerns, Extension Entomologist
Patrick Porter, Extension Entomologist

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