

FOCUS on South Plains Agriculture

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New Cotton Entomologist

Apurba Barman Starts as Extension Cotton Entomologist

Howdy! I am Apurba Barman, the cotton Extension entomologist based at Texas A&M AgriLife Research and Extension Center, Lubbock, TX. The Texas High Plains is not new to me since I received my education at Texas Tech University and conducted cotton entomology research in this area for several years. I received my Ph.D. from Texas A&M University and, before joining this position, worked with the University of Georgia. I am very excited and happy to be back to Lubbock and work for the biggest cotton community in the globe. I look forward to working collaboratively with the extension specialists, research faculty, our county IPM agents, consultants, industry partners and, most importantly, with the cotton producers to address the insect pest issues in the High Plains cotton and find effective and economical solutions. Please feel free to give me a call (office: 806-746-6101) or email me at apurba.barman@ag.tamu.edu or stop by my office (1102 E. FM 1294, Lubbock, TX 79403) to visit about anything of interest in cotton insects. Thank you all for giving me this opportunity to serve the cotton community here and letting me do what I like the most.



Cotton Agronomy

Recap of 2012 Crop

According to recent National Agricultural Statistics Service data (NASS), cotton producers in the High Plains region planted around 4.22 million acres in 2012. Estimated harvested acres were 3.23 million with 45% of planted acres abandoned. The January estimate for total production was 2.92 million bales. The 2012 crop year in the High Plains was better than 2011, but not by much. Unlike 2011, precipitation allowed for some planting moisture for stand establishment in most areas. This was mostly helpful to producers with sub-surface drip and dryland producers who experienced great difficulties in stand establishment in 2011. However, for the most part, the dryland acreage in those areas were able to get stands established only to see dry conditions

return later in the season resulting in failed crops with few dryland acres going to harvest. Finally, in most of the region, the season was brought to an abrupt end by an 8-October freeze event. Fortunately for most, abnormally warm dry September conditions provided for above normal heat unit accumulations and minimized the detrimental effects on fiber quality. In spite of the early freeze event, the Lubbock classing office reported an average micronaire of 3.89 for the season and a 4.08 average micronaire was reported from Lamesa. Other fiber quality parameters reported from Lubbock included staple (35.42 avg), strength (30.02 g/tex avg), and uniformity (79.72% avg). Lamesa staple, strength, and uniformity averaged 35.21, 30.01 g/tex, and 79.94%, respectively. An average color grade of 21 was reported from both classing offices. However, both classing offices reported bark content for approximately 26% of the combined 2.89 million bales classed. The higher than normal occurrence of bark is mostly attributed to the early freeze event.

Agronomy Update

As cotton planting quickly approaches, the Texas High Plains are still experiencing moderate drought conditions. According to reports from the Lubbock Airport – National Weather Service, a total of 2.92” of precipitation (rain and snow) accumulated from 1-November, 2012 to today. Although some areas of the region are in better moisture condition than Lubbock area, more precipitation is needed to achieve adequate soil moisture for planting and to replenish the soil profile. Furthermore, most precipitation events came in small increments and in were followed by high winds which limited absorption into the soil. If a significant amount of precipitation does not occur prior to planting, pre-plant irrigation may need to be applied for stand establishment. If planting too early and cool temperatures are observed, the possibility of “chilling injury” is greatly increased. Temperatures at 41° F can damage or even kill seed. Damage to seedlings from chilling injury can include aborted root tips and decreased vigor. If the root tips are damaged or aborted, the roots will not penetrate the soil to normal depths and “crow-footing” may be observed. Getting off to a good start is critical to a successful growing season and optimizing yields and profitability. In summary, planting high quality seed at recommended seeding rates to a firm, moist seed bed at 65° F or better with a favorable five to seven day forecast will greatly increase chances for success.

Variety Selection Process

Selecting productive cotton varieties is not an easy task especially in the Texas High Plains, an area where weather can literally “make or break” a crop. Producers need to do their homework by comparing several characteristics among many different varieties, and then keying these characteristics to typical growing conditions. We can’t control our growing environment from year to year, but we can select the varieties we plant based on desired attributes. It is very important to select and plant varieties that fit specific fields on your operation. Don't plant the farm to a single variety, and try relatively small acreages of new ones before extensive planting. Don't forget to target specific diseased fields with the best varieties under those conditions.

Variety Testing Publications

If disease issues are not concerning, then scrutinize all possible university trial data that are available to see how a specific variety has performed across a series of environments, and if possible, across years. It is best to consider multi-year and multi-site performance averages when they are available. However, due to the rate of varietal release, many new varieties are sold which have not undergone multi-year university testing, or perhaps no university testing at all.

Dr. Jane Dever has published the [Cotton Performance Tests in the Texas High Plains and Trans Pecos Areas of Texas 2012 report](#). This report contains data on numerous entries in several small plot trials. Small plot trials enable producers to observe results from a large number of entries at multiple locations. These trials are normally conducted under uniform, disease-free conditions, unless a test is specifically targeted toward a certain disease. Dr. Dever has included summaries over locations for some sets of trials. This is an outstanding resource and provides much information on variety performance, including lint turnout, fiber quality, earliness, plant height, and storm resistance. Results from locations with Verticillium wilt, Root-knot nematode, and Bacterial blight are also available in this publication.

The Texas A&M AgriLife Extension and Plains Cotton Improvement Program, “2012 Systems Agronomic and Economic Evaluation of Cotton Varieties in the Texas High Plains” report is also available. This report contains multiple locations of replicated cotton demonstrations conducted by Texas A&M AgriLife Extension personnel in producer-cooperator fields across the region. Since these trials are planted and harvested with producer-cooperator equipment, the number of entries per site is generally less than 15, and many times less than 10. However, these trials reflect a wide range of cultural practices, locations, irrigation types, etc. Producers should look closely at location site descriptions and compare management practices of cooperating producers to theirs to make informed variety decisions.

Deep Soil Sampling for Residual Nitrates

With high fertilizer prices, special emphasis is being placed on reminding producers about proper soil sampling and testing techniques. One of the most costly fertilizers is nitrogen (N). Nitrogen is important for producing protein in plants and crop demand is very much yield driven.

Establishing a realistic yield goal is the first task. Producers shouldn't take the attitude that cotton is like a grain crop. The more nitrogen applied when given high water doesn't necessarily translate into higher yield. Many times we can retain the fruit in a high water input field but not have time to mature that fruit. This results in a large number of pounds of lint, but can significantly reduce maturity because the late-set bolls do not have adequate time to mature.

Excess N can aggravate the problem by delaying crop maturity, especially if poor maturity weather is encountered in September and October. There is a fine line between obtaining an adequate yield and having good maturity in the crop, especially north of Lubbock. Excessive N can result in 1) Unwanted crop growth which in turn will require plant growth regulator (such as mepiquat chloride) application - especially on varieties that are inherently "growthy", 2) Increased Verticillium wilt problems, 3) Increased aphid problems, and 4) More harvest aid challenges at the end of the season.

Over the last several years agronomists across the state working in cotton have surveyed residual N in the soil profile in producer fields. Results from several of these locations indicate

considerable amounts of N that should be accounted for when determining how much N fertilizer to apply. Soil sampling to a depth of 24" is recommended especially following the two most recent years where well below average rainfall was observed and yields were lower than anticipated. Under "normal" conditions, in the High Plains region, many fields may encounter this deep N somewhat later in the season resulting in a surge of green at a time when we would like for the fields to become more N deficient. Based on research projects this is likely a contributing factor to lower micronaire in some fields in years with poor maturing conditions.

The basic formula for success is this: 1) Determine the yield goal in bales per acre for the field based on irrigation capacity, varietal performance, early season profile moisture, etc. 2) Multiply this yield goal times 50 pounds of N per bale of production. 3) Deep sample for residual soil N down to the 18-24 inch depth. 4) Submit the samples to a soil testing laboratory, fully recognizing the depth that the sample represents. 5) Use the appropriate conversion factor based on the depth of sampling to convert the nitrate-N test results from the laboratory to pounds of N per acre IF the laboratory does not provide this service. 6) Subtract the amount of residual N found from the N fertilizer needed based on the yield goal. If high nitrate-N irrigation water is used, then additional steps must be made to compensate for N delivery during the growing season. Based on 10 ppm nitrate-N concentration in irrigation water, application of an acre-ft (12 acre-inches) during the growing season will result in about 27 pounds of N being simultaneously applied. Few High Plains wells will have nitrate-N concentrations of that magnitude. However, with high fertilizer prices, the water should be checked and credits made for this against overall N fertilizer application. [Here is more information on cotton fertility](#) hosted on the Lubbock server. MK

Wheat Freeze Follow-up

Wheat Condition on the South Plains

I looked at ~20 fields Thursday, April 4 from Lubbock to Swisher, Lamb, and Castro Counties. Most fields were OK with only minor scattered symptoms of freeze injury, but two in bad shape:

- 1) A dryland field had up to 40% dead growing points, but I think it was the drought that deserves the initial blame, and the freeze has finished it off. The field needs to be grazed off in order to salvage any value from the crop unless rain come immediately.
- 2) The second field, also near Halfway was overwhelmed with greenbugs and some Russian wheat aphid, and of the most recently emerged leaves (all sizes), 28 were dead upon emerging in poor areas of the field (corresponds to Fig. 7 in "Freeze Injury on Wheat" listed below. There were at least 50 more dead casks per square inch under the dead leaves. In relatively healthy areas of the field (still some aphids), 16% of the most recently emerged leaves were dead.



Major aphid damage near Halfway, TX (2013). Most insects were greenbugs although a few Russian wheat aphids were present, too. Without quick control this field will be lost for grain production.

One additional field west of Happy had about 20% dead growing points, but my advice to the grower was don't worry about it right now, especially since the growing points were so small and it was hard to tell how much of his crop was damaged. He will currently irrigate the same for grain or forage, then check in 7-10 days when the growing points/heads will be larger and easier to assess. I think he is OK for grain but will have some loss. This field was planted Sept. 20 so it is in more advanced growth stage than other wheat up in that area.

Other Symptoms...

The most common report from producers is leaf tip burn. Though this can be an important consideration in that it alerts us to field issues, foliage is exposed to the actual air temperature in contrast to the growing point down in the wheat canopy. Foliage that is green and lush is likely more susceptible to this cosmetic freeze injury. Only a few split stems were observed at the base of plants that were erect, but a few wheat fields, ones that were in more advanced growth stages, do have some that are either brown or the nodes have a brown blotch in them. The brown stem can sustain for a while, but if earlier injury occurs before heading, etc. then the stem is largely unproductive.



Typical minor leaf tip burn, Lamb Co. Leaf tip burn is only 1 to 2% loss of vegetation but because it is on the top of the plant it is more readily noticed. This minimal loss will not affect forage yield or quality.



Split stem from freeze injury at the base of the plant. If you see a significant number of split stems there is increased concern about the viability of the growing point.



The left stem has collapsed and appears almost dead below the node. This will cut off water evapotranspiration and nutrient flow to the growing point and eventual head. Likewise, the brown node on the right appears to have been damaged limiting water and nutrients to feed the upper stem and growing point though in this case the growing point itself is still white and alive.

Evaluating the Growing Point

This is the crux of surviving a wheat freeze. You can have a lot of damage but if the growing point is intact the wheat can still deliver good production. Early assessment of the growing point can be tricky especially if it is $\leq 0.25''$. If the head is this small then it may not clearly show signs of its status. These tiny growing points can look white at first, and featherlike. If they begin to show a tan color rather than a yellow to greenish tint as in Fig. 6, then that is a sign of plant death. Once the growing point dies the vegetative production of that stem is stopped, and it will not get any larger (you might not realize this, however, due to ongoing growth of tillers). If it is hard to tell (like the field described above west of Happy), then just come back in a week. The dead growing points will still be the same size, but healthy growing points will continue to elongate and move up the stem.



A healthy growing point about 5/8" long that has a light green color, not tan or even brown. This is a productive head.

Overall, for the wheat fields I have seen this year, if a field looked good from the road, it was in pretty good shape (I know that we are not supposed to give that simplistic info!). Some leaf tip burn, but the foliage area that is lost is actually <2%, but since that 1-2% is on the top of the plant you notice it. The overall freeze injury comment "It is never as bad as it looks..." (Brent Bean) does hold true about 90% of the time. This is in stark contrast, however, to Oklahoma State's April 5 report from small grains Extension specialist Dr. Jeff Edwards, who surveyed SW Oklahoma where the damage was not only as bad as it looks in most cases, but worse, i.e., there were a lot of dead growing points down in the stem).

Planting Date and Delayed Jointing Have Helped Us in 2013

Delayed planting (past late October in the Northwest South Plains to after mid-November in the lower South Plains) can reduce grain yields significantly. But this year, later planted wheat was much less susceptible to the freeze damage. Also, I estimate that in most of the region jointing was up to two weeks later than average. Furthermore, wheat that had been grazed back was not as far along thus less susceptible to freeze injury.

Other Reports

Lubbock Co. (Mark Brown, April 2): One field planted a little later, less than 10% damage on larger stems (assuming smaller ones are OK); another older field 40% damage on larger stems, but on a low end of the field dipping down into a playa basin (the rest of the field assumed less to much less injury, and this injury only on main stems).

Terry & Gaines Co. (Scott Russell/Ben Neudorf, April 4): Some rye that is damaged because it was headed out much earlier, but for the most part no major concerns.

Dawson/Martin (Trostle, April 3): Top leaf burn, at worst, was noted. A few stems in some wheat along the pivot tracks had minor damage (the cold penetrated further in to the side of canopy where there were no plants).

Is there any need for change in management to wheat in the South Plains?

Overall, no, with rare exceptions. Fields suffering from drought or insect damage may have been more vulnerable. I think there are no management changes in general for any South Plains wheat (a few individual fields excepting). I do not think that grain yield losses are significant. Fields are in worse shape due to drought rather than the freeze (on dryland), and advice to growers for dryland wheat is to consider “the bird in the hand” which is what will give you income now, which is to graze (forage is too short to hay), and if there is no rain soon, then clearly there will be limited grain and grazing potential will deteriorate. As a reminder you may access the [wheat freeze information here](#). CT

South Plains Agriculture Photos

We have started a new website that is somewhat about insect identification but also features several galleries of photos from the South Plains. Galleries include Agricultural Images, Landscape Images, Insect Images and Local Flavor Images. This website also features the latest editions of FOCUS in both html and PDF. Go to <http://texashighplainsinsects.net>. RPP

FOCUS on South Plains Agriculture

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[Water Management Website, TAMU](#), [Irrigation at Lubbock](#), [IPM How-To Videos](#), [Lubbock Center Homepage](#), [Texas AgriLife Research Home](#) , [Texas AgriLife Extension Home](#), [Plains Cotton Growers](#)

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