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FOCUS on South Plains Agriculture

Texas AgriLife Research and Extension Center at Lubbock
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Cotton Insects

Thrips

Similar to last year, early thrips appear to be sporadic throughout the Southern and High Plains. In the Lubbock area and south, thrips have been fairly light, although I have noted at least one field of early planted cotton in Cochran County that was approaching the treatment threshold. The current action threshold for thrips is one thrips per plant from plant emergence through the first true leaf stage, afterwards the treatment threshold is one thrips per true leaf until the cotton has 4 to 5 true leaves.

Up in the Dumas, Dimmitt and Muleshoe areas, much of that cotton is just coming up good and thrips are just beginning to colonize. Because of the cool temperatures and heavy thrips pressure normally encountered in these areas, much of that cotton is treated preventively with Temik, Cruiser, Avicta Complete Cotton, or Aeris. Seed treatments of Aeris, Cruiser, or Avicta CC should provide 3 to 4 weeks of protection, whereas Temik at 3.5 lbs or more will typically provide 28 to 30 days of protection. However, if a preventive treatment was not used, fields need to be watched closely; especially during the first few weeks following emergence. Data collected in 2007-08 suggest that under cool conditions it pays to be aggressive with thrips. When temperatures were running around a high of 80 degrees and lows in the mid-50s, it was beneficial to treat for thrips when they average 0.5 thrips per plant at the cotyledon to 1 true leaf stage. This is below the current recommend action threshold. However, when temperatures are hot (highs in the low 90s and lows in the low 70s) as many as 2 thrips per true leaf can be tolerated. This is above the current ac-

tion threshold. As you can see, there is much work to do in refining the action threshold for thrips.

All cotton, regardless of prior treatment, needs to be monitored at least weekly for thrips control determination. Thrips prefer to feed on the underside of the leaves and primarily on the newer growth. Thrips, particularly the immature stages, are somewhat cryptic and like to hide in curled leaves. Thus when scouting for thrips, it is important to tease open curled or folded leaves using a knife or pencil to find the thrips hiding within. If there was a soil applied insecticide or seed treatment used for thrips control, the presence of immature thrips will indicate that colonization is occurring and that the insecticide is playing out. When this occurs, a foliar insecticide application may be justified. DLK

Cotton Insect Research Update

There is a great deal of research on cotton insects being conducted this year, and I wanted to make you aware of the sorts of projects in our region. Much of the research originates from the Lubbock Center, and involves Research and Extension personnel, including county based IPM and County Agents. However, some research is headed up by faculty at College Station and some is directed by IPM agents.

Thrips Research: We have quite a bit of thrips research going on this year with 24 test locations, ranging from Sunray to Seminole. A number of these sites deal with research investigating the refinement of the thrips action threshold and developing better sampling techniques. Other tests are investigating the effectiveness of various foliar, in-furrow and seed treatments for thrips management.

Additionally, we are involved with a project originating out of Dr. Micky Eubanks' lab in College Station that is looking at how some insecticide seed treatments might affect plant biochemistry and subsequently non-target pests. Dr. Jane Dever and Mark Arnold are continuing their work screening cotton for resistance to thrips.

Lygus and Cotton Fleahopper Research: Dr. Megha Parajulee's lab is heavily involved in various Lygus research projects including looking at how area habitat influences Lygus abundance, movement, and how these habitats might be managed to lessen Lygus pressure. His lab is also evaluating the ability of cotton to compensate square loss to Lygus and fleahoppers. Additionally, his lab is looking at characterizing insecticide susceptibility in local Lygus populations and how insecticides affect Lygus behavior. Other Lygus work addresses boll susceptibility and damage potential as well as insecticide efficacy. Also, cotton leaf hairiness is being evaluated for its impact on fleahopper colonization and survival. Along with Dr. Raul Medina in College Station and Dr. Chris Sansone in San Angelo, Dr. Parajulee is also involved in looking at cotton fleahopper movement and refining the action threshold.

Aphids and Mites: Dr. Parajulee has a project looking at impact of nitrogen fertilizer has on aphid outbreaks and population development, and we will continue to evaluate insecticides for aphid management and their impact on natural enemies and mite outbreaks, as well as the evaluation of miticides.

Bollworms and Beet Armyworms: Work will continue monitoring the seasonal abundance of bollworms; and in cooperation with Dr. Patricia Pietrantonio in College Station, effort will be directed towards evaluating bollworms for resistance to pyrethroids.

Larger Black Flower Beetle: Drs. Christian Nansen and Pat Porter will be continuing their work investigating techniques to manage larger black flower beetles in gin trash.

As you can see there is a great deal of research being conducted on cotton insects on the Southern and High Plains of Texas; actually more than what is being reported here! Keep in mind that we are here to serve you, and if you encounter a problem that you think should be researched, do not hesitate to contact us. DLK

Cotton Pests Around the State

Upper Coastal Bend (reported by Clyde Crumley, IPM Agent, Matagorda, Wharton, and Jackson counties)

Conditions have been warm and dry and cotton growth stage is quite variable, ranging from pin-head size to 1/3 grown squares. Square set has been high, > 85%, but we are seeing some increase in fleahopper numbers in some areas. Aphids can still be seen in spots throughout the region and boll weevil trap catches have been much lower than last year.

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

Cotton is ranging from cotyledon to pinhead square stage, although most is in 3 to 6 true leaf stage. Thrips have been a concern, but about 50% of the cotton is beyond the susceptibility window. Aphids have mostly been light, with a few moderate infestations, and cotton fleahoppers are ranging from 0 to 2 per 100 terminals.

Cotton Agronomy

Overview of 2009 Season Thus Far

Planting of the 2009 crop is now underway. The recent "schizophrenic" weather has many producers scratching their heads, looking to the skies and praying for rain. Last September and October, Lubbock received a total of 12.47 inches over the "official rain gauge" and thus far from January through May 20, 2009 we have had a total of 3.08 inches (Lubbock 2009 Rainfall slide). For the month of May thus far, we have received only 0.33 inches of rainfall at Lubbock. Because of last fall's high rainfall in most of the region, we generally have good to excellent subsoil moisture. However, the surface is very dry in most fields at this time.

Although at Lubbock we have had 6 days with zero heat unit accumulation, other days have been warm enough to produce a total of 174 DD60s from May 1 through May 20 (Lubbock May 2009 Temperature slide). That is about 10% above normal for that time period. The distribution has been fairly poor, and the lack of moisture coupled with poor temperature distribution has resulted in many fields planted during the May 8-May 11 time frame only now emerging. Several days have been teasing us with high humidity and early morning fog, but have not produced badly needed rainfall in most areas. Night time lows have been "yo-yoing" and several have been below 50 degrees during May. This could possibly result in chilling injury, especially in irrigated fields north of Lubbock. I have not had any calls yet relative to these concerns. Daily highs have also exhibited the same pattern, with highs ranging from the low 60s for some days up to our first 100 degree day of the year on May 7. The most serious weather consequence at this time is lack of rainfall. Some thunderstorms have brewed up and provided some badly needed precipitation in some spotty locations, but a good regional 2-inch rain is required to put us in better shape for this time of year.

Due to the peanut, corn and perhaps failed wheat situations it is thought that Districts 1N and 1S will plant around 3.4 million acres. If that holds we will be about 200,000 acres above last year's regional plantings. Irrigated cotton planting is well underway at this time. Due to lack of precipitation, many center pivots are being cranked up as the planters leave the fields. Most of the center pivot irrigated fields are well on their way to stand establishment. Many sub-surface drip irrigated (SDI) fields, however are struggling. In what seems to be a perennial problem, SDI field managers are running the system attempting to push moisture to the top of the dry beds to facilitate seed germination (link to SDI photo here). Some fields are more successful at this than others, but it can turn into a major challenge for SDI acres in most areas.

A good one-inch rainfall event would correct some of these issues by "painting over" dry surface soil conditions. Based on my tracking of the Extension agent reporting of planting progress for the last several years, we are somewhat behind. The "average percent planted" across the District 2 reports as of Friday, May 15 was about 35%. With all of the activity this week, and generally good conditions, I suspect that we are in "catch up mode" at this time. It is likely that several counties probably have a majority of irrigated acres planted while dryland producers wait for badly needed rainfall. We have a fair chance of precipitation forecasted for later in the week and over the weekend. It is beginning to be "crunch time" for the region's dryland acres.

We are now about a little over a week away from the Final Planting Dates for Insurance Purposes for the northern counties (May 31 dates) in the Southern High Plains region. Producers in the central and southern counties have until June 5-10 (depending upon county) before the Final Planting Date for Insurance Purposes is reached. I submit that if the dryland areas do not obtain significant precipitation over the weekend, the planters will be loaded and perhaps around 1 million acres or greater will be dry planted as soon as possible.

Reminder - 2007 Cotton Resource DVD

In December, 2007 we generated the 2007 Cotton Resource DVD (CRDVD). It is a follow-up publication that is similar to the 2005 Cotton Resource Compact Disk, and is a data DVD format (not the same format as movies on DVD). To use this DVD, one has to have a computer with a DVD reader. A progression away from CD format was required in order to have enough space for all of the publications included. This CRDVD literally has dozens of publications, across such diverse cotton production topics as 1) general production, 2) irrigation, 3) fertility, 4) insects, 5) weeds, 6) nematodes and disease, 7) harvest, fiber quality and ginning, 8) economics, 9) Internet resources, 10) photo gallery, and 11) videos. The photo gallery contains many images of insects, diseases, weeds, and herbicide symptomology. The video section has helpful information on insect scouting, irrigation, and other topics. Additionally, the entire Cotton Physiology Today Newsletter archive is on the CRDVD. The 2007 CRDVD project was funded by the Texas Support Committee - Cotton Incorporated. To obtain a free copy of the CRDVD, call Dena Griffith at the Texas AgriLife Research and Extension Center at Lubbock at 806-746-6101. The contents of the CRDVD can be accessed by clicking here.

Seedling Emergence Issues

I have had a few calls concerning cool temperatures and the effect on cotton seedlings. There is a good publication from Cotton Physiology Today published by the National Cotton Council. It can be obtained from the Lubbock Center Web site . This issue includes discussions of the following topics:
Planting and Replanting Decisions, Photographs of Chilling Injury, and Cotton Stand Establishment

Cotton Root Disorder Guide

The Cotton Root Disorder Guide might be a useful tool. This guide was published by Cotton Incorporated a few years ago. It was generated by several workers across the Cotton Belt and was funded by the Texas and Arkansas State Support Committees. Cotton root disorders detailed in the publication include: herbicide injury from amino acid synthesis inhibitors, photosynthetic inhibitors, and seedling growth inhibitors; pathogens including fungi and nematodes; fertilizer injury; chilling injury; and soil compaction.

Tank Cleanout Concerns

This time of year, I perennially begin to get phone calls and make field inspections concerning hormone-type herbicide damage on cotton. Typical phenoxy herbicide symptomology includes “strapping of leaves.” Based on field research conducted by Dr. Wayne Keeling, the severity of yield decrease is re-

lated to the actual dose and the crop stage. Severe damage incurred when the crop begins to fruit is more likely to reduce yield than when the crop is younger with less severe damage. Doses of sufficient level to continue "strapping" of newer leaves for weeks after application will probably significantly negatively impact yield.

Producers should be aware, especially in light of the "tank and hose cleaning ability" of some of the newer herbicides, that phenoxy residue in sprayers can be a real problem. ***My suggestion for our growers is that tanks, hoses, and sprayers which are used for applying phenoxy type herbicides be dedicated SOLELY to that purpose.*** If producers are unable to purchase separate tanks, hoses and/or sprayers, then it is imperative that several issues be addressed. Do not leave herbicides in tanks for an extended period of time. It is best to use "chemical resistant" hoses. Replace hoses when changing out tanks. The last thing a cotton field needs is for a phenoxy material (even at low concentrations) to get "pulled from the tank or hoses" and get sprayed on cotton – especially those fields with high yield potential (i.e. subsurface drip or high capacity pivots). If multiple herbicides are used in the sprayer, then I suggest that producers purchase various tank cleaning agents from their dealers and follow the directions, including cleaner concentration, religiously. If a tank/sprayer is to be used on cotton, I suggest that the tank be flushed out with clean water and the appropriate tank cleaner be mixed at the appropriate concentration. The producer should then spray the cleaning solution through the booms and nozzles. Leave the booms in a horizontal position and let the cleaning solution sit in the tank at least overnight. This might help reduce some anxiety over phenoxy damage later. It doesn't take very many lost bales of production to pay for an additional tank and hoses or sprayer.

For a great University of Missouri publication on cleaning sprayers, click this link. This publication has good information concerning herbicides, recommended cleaning solutions and sensitive crops.

Bayer CropScience GlyTol Trait in Cotton Receives USDA Approval

Bayer's newest herbicide tolerance trait, GlyTol has received USDA approval. Bayer's proprietary technology imparts glyphosate tolerance in varieties containing the trait. Based on several regulated trials conducted over the last two growing seasons, it appears that this is excellent technology. The news release makes the following statement: "The GlyTol trait provides robust tolerance to applications of glyphosate, and gives growers the flexibility to select any brand of glyphosate herbicide labeled for use on cotton without concern for crop safety." Here is a link to the news release. RKB

Corn Entomology

Optimum AcreMax 1 Scientific Review

Transgenic corn has been regulated, in part, by EPA since before it was introduced in 1996. EPA and the companies that produce the transgenic technologies (the Registrants) work to establish, among other things, Insect Resistance Management (IRM) plans for each transgenic technology. Until now there has been significant uniformity in requests from the Registrants for IRM plans for both corn toxic to rootworms and corn toxic to caterpillar pests (or toxic to both pests in the case of stacked toxins). With some slight variation in planting schemes, all of these IRM strategies call for a 20 percent non-transgenic refuge planted in strips within a field, separate sections of a field, or in fields in close proximity to where the transgenic corn was planted. Many years of scientific effort by university scientists and industry have gone in to developing IRM plans. However, Pioneer has asked EPA to be allowed a refuge that consists of mixing no greater than 5 percent seed that does not have corn rootworm protection (but does have caterpillar protection) in a bag with transgenic seed that has both corn rootworm and caterpillar protection. They are marketing this seed

mixture as Optimum AcreMax 1 and calling it a "refuge-in-a-bag" and it would result in a 5 percent (or less) corn rootworm refuge. (It is true that the refuge for corn rootworm would be in the bag, but one would still need to plant a separate 20 percent structured refuge for caterpillar pests.) Pioneer does not have EPA approval for Optimum AcreMax 1.

A FIFRA Scientific Advisory Panel was recently convened to render opinions on whether this "refuge in a bag" concept (and at the 5 percent level) was adequate in terms of an IRM plan for corn rootworms. The bottom line is that the Scientific Advisory Panel had concerns and uncertainties about Pioneer's proposal. Their full report is available here, and a very nice encapsulated summary is available in the latest Bulletin from the University of Illinois. The EPA will take the SAP report into consideration when deciding whether to approve Pioneer's request.

The rootworm toxin in Pioneer's Optimum AcreMax 1 is Cry 34/35Ab1, the same toxin in Herculex corn that has a 20 percent spatial refuge. There are really two issues before EPA now; a seed blend for corn rootworm IRM instead of a spatial refuge, and a drastic reduction in the amount of refuge. This should be an interesting decision. We will keep our readers posted. I recently developed a table that lists all of the transgenic corn types. It is intended to be a quick reference for all single toxin and stacked toxin corn hybrids on the market or nearing registration. The table of transgenic traits is available here. RPP

Wheat, Sorghum and Sunflower Agronomy

The Outcome of Freeze Injury on Wheat

Assessing freeze injury and the implications for yield potential in the 2009 wheat crop has been difficult. Apart from the freeze injury incurred at the end of March, there were two strikes against much of our wheat crop in 2009.

First, conditions have been excessively dry for much of the region's wheat, especially over the winter months. Yet a few fields appear to be in excellent shape. I believe the main reason is these fields did receive significant irrigation during the winter months, similar to high yielding fields in 2008.

Second, this is the worst outbreak of Russian what aphid (RWA) in recent memory. Extension was called to assist wheat freeze injury assessment of many wheat fields only to note that RWA activity was high. Some fields in the region that escaped significant freeze injury and have retained good yield potential have been sprayed for RWA twice and in a few cases even three times.

More recently, some fields have also had modest levels of foliar disease, likely wheat streak mosaic or its cousins High Plains Virus or the Triticum virus. These three diseases are essentially indistinguishable from each other in the field. Only a lab analysis such as that conducted by the High Plains Plant Disease Diagnostic Lab at the Texas AgriLife Research & Extension Center in Amarillo can identify the specific virus.

Fields even with low levels of irrigation have been terminated or abandoned. In some cases the crop has been cut for hay, but much of the wheat is so short that forage yields are low. On the other hand, numerous fields that were marked with grain yield potential losses of 50% or more have recovered better than expected. In many cases damaged stems survived and smaller tillers have compensated for main stem losses.

Estimating Wheat Yield Potential

Recently Extension has received several inquiries about estimating the yield potential in wheat, particularly for marginal fields where producers debated whether to cut for hay. Estimating wheat grain yield potential is difficult prior to heading. Once heading occurs, however, producers may use the Extension guide for estimating wheat yield potential, which is also available from your county Extension office.

The guide uses seed number per head as part of the basis for calculation. At this point for headed wheat, I find it easier to determine seed per head by counting the spikelets per head. These are the 'units' that contain flower parts on each side, and usually an additional potential floret in the center, maybe even two. For an irrigated field I would anticipate 17 or so spikelets for a large head (and can be more than 20 in a few cases) to smaller heads with 12-13 spikelets. Very small heads (late emerging, small tillers) further down in the canopy might have 8-10 spikelets. I conservatively assume 2 seeds per spikelet, but there is always a potential for 3 and 4. If the wheat is past flowering by a week or more, you may be able to determine that the individual floret in the spikelet actually has a seed in it (the seed grows from the end, like blowing up a long narrow balloon), so in that case you can readily see the beginning of the actual seed. In some headed fields recently there are heads that are pale, (not bleached white like in a freeze, but light in color, a tint of yellow, and little to no green), and these heads often appear to be affected by Russian wheat aphid (that is the leaves and leaf sheaths are bleached, and the stems are pale to approaching white). The floral structures appear to all be intact, but I don't know how well these may pollinate and have seed set.

Current Daily Water Use for Wheat

Based on the calculated water use per day from the High Plains Potential EvapoTranspiration (PET) Network, currently daily water use in May for wheat has ranged from 0.04" per day (cloudy, cold days) to over 0.33" per day (mid 90s, breezy). On typical days in the region wheat with normal growth is using about 0.2" per day. Your peak need for irrigation to drive yield will run from flag leaf emergence through milk stage, which I estimate occurs about 2.5 and maybe 3.0 weeks after flowering (will depend on weather). At that point irrigation needs decline.

Late Season Irrigation of Wheat

Irrigation needs—how much to apply and how late to apply it—will depend on yield potential, cost of irrigation, stage of growth, etc. What stage is the crop in terms of heading? Most wheat in the region is now post-bloom unless planted late northwest of Lubbock? Once wheat is past flowering then the window for beneficial additional watering is shortened as grain fill can occur as quickly as 30 days in a high stress environment.

Benefit from irrigation is questionable when kernels are past milky ripe, especially if there is still some decent soil moisture. When kernels are milky ripe, then chances that economic yield responses may be achieved due to irrigation are reduced. Once kernels are mealy ripe (that is what I call the intermediate stage between milk stage and soft dough; you squeeze the seed and it oozes out mealy or gel-like material, but does not squirt any more) then the crop will soon be drying down, and irrigation would have minimal effect provided if there is at least some soil moisture still available. Once your grain is in soft dough irrigation could pretty well be eliminated even if there is not much soil moisture available.

Grain Sorghum Seeding Rate Guidelines

Have you heard this sorghum seeding rate rule of thumb?

I have encountered this older seeding rate comment mostly south and southwest of Lubbock: Plant 1 lb. of grain sorghum per acre for every 1,000 lbs. per acre of yield goal. I think that is a pretty good guide—*up to about 2 lbs. per acre!* This type of rule of thumb quickly leads to too high seeding rates, especially for sandy soils with reduced water holding capacity.

Farmer seeding rates for many grain sorghum fields, whether irrigated or dryland, are higher than they need to be. Extension's base seeding rate for dryland grain sorghum in the Texas South Plains when soil moisture is at its highest is about 30,000-35,000 seeds per acre.

Dryland—When soil moisture is low for dryland sorghum then 2 seeds per foot on 40" rows, or 26,000 seeds/acre is a good target. This reduces the risk the crop burns up in a dry year, but is still high enough that if conditions turn favorable it will deliver a good yield.

Limited irrigation—Fields with target levels of irrigation in the range of 6-8" irrigation, an irrigation level that is common for grain sorghum in much of the South Plains, the following general guidelines reflect the level of stored soil moisture at planting:

If soil moisture is low, then target seeding rates at 40,000-45,000 seeds/acre
If soil moisture is high, then target seeding rates at 50,000-55,000 seeds/acre

These are realistic targets that can deliver good yields, but they retain modest plant populations that are better equipped to handle very dry conditions should that occur.

Full irrigation—We rarely if ever recommend seeding rates over 80,000 seeds per acre even with the highest levels of irrigation. Even when full irrigation is planned, seeding rates may still be adjusted downward if available soil moisture at planting is low.
If you have to debate whether to go with a higher seeding rate on grain sorghum, then it is probably wise to stay with a lower target seeds per acre.

Sunflower Hybrid Trial Performance Data

The official Texas AgriLife Research Crop Testing Program has conducted sunflower hybrid performance trials for the Texas High Plains in 2006. Trial results, including three-year averages for confectionary and oilseed hybrids at Lubbock, are available on the web. A significant portion of the region's confectionary sunflower is already planted, but much of the oilseed crop will be planted into late June and early July. Trial performance data has found minimal differences between high oleic yield and oil content vs. the mid-oleic NuSun hybrids. Additional sunflower resources for West Texas are on the web at http://lubbock.tamu.edu/sunflower . CT

Regional Scout School May 29th

The long-standing training for crop professionals and field scouts will be held at the Lubbock Research and Extension Center on May 29th. We have temporarily moved the school from Plainview following Greg Cronholm's retirement. The agenda is attached.

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