FOCUS on South Plains Agriculture

A newsletter from the Texas AgriLife Research and Extension Center at Lubbock

Volume 52 number 7 7 June 2013

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http://lubbock.tamu.edu/focus

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Cotton Entomology

Current insect situation and injury to seedling cotton

Most of our irrigated cotton is currently in the 1-2 true-leaf stage. At this stage, cotton seedlings are highly vulnerable to thrips injury. Based on my observations within cotton fields at several locations (Lubbock, Halfway, and Muleshoe) and information gained from the Texas A&M AgriLife Extension IPM-Agents in these locations, cotton seems to be experiencing moderate to heavy thrips pressure. On several occasions, we have seen as many as 10 thrips per plant. While the majority of the thrips observed were adults, there were a few immatures too. The presence of immatures in fields, which were planted with insecticide treated cotton seeds, is a definite indication that the crop is at risk to thrips damage. As seed treatment's residual activity fades away, thrips can establish and reproduce on cotton seedlings, and that is when we will start to pick up immatures.

Symptoms of thrips feeding on cotyledons are characterized by silver-colored patches on the underside of the leaves (Figure 1A). If the crop already has true leaves, thrips are likely to move inside the furled terminal and curled edges of the true leaves can be observed (Figure 1B). Damaged terminals and true leaves will be deformed and reduced in size, but severity levels of thrips injury should not be made based solely on leaf size (Figure 2). Leaf size reduction can also be the result of injury by wind-blown sand. Upon close observation, these two types of injury (thrips versus sand) can be distinguished. Cotyledons with irregular shape and reduced in size, necrotic (dead areas, black in color) boundaries, and without any silvery patch are most likely the result of sand injury. Similarly, when true leaves experience high velocity sandblasting, they appear to be curled upward, deformed, and reduced in size along with black necrotic areas (Figure 4A and 4B). The main stem of cotton seedlings also suffers injury by wind-blown sand and necrotic areas can be observed on the stem. In contrast, if the injury is caused by thrips alone, cotyledons will have silvery patches and true leaves will be crinkled and deformed without visible necrotic areas. However, in the Texas South Plains region, where we experience frequent "dust-storms", cotton seedlings are likely to experience both kinds of damage at the same time, resulting in additional stresses to the crop. In terms of thrips management in this situation, we need to monitor/scout cotton fields more closely and make decisions based on the threshold. While the standard threshold for thrips is one per true leaf, under such stressed conditions, this threshold should be lowered to half a thrips per true leaf. Because plants are already so stressed by the sandblast, they cannot tolerate the same thrips pressure that rapidly growing plants can withstand.

Cotton planted in no-till wheat fields are more protected from wind-blown sand damage compared to the conventional-tilled fields. In one of my Lubbock field trials, cotton was planted in a no-till field and the seedlings looked healthy, without any damage from sand abrasion . Cover crops, such as winter wheat stubble can protect young cotton seedlings from injury by

wind-blown sand. I also noticed a significant presence of beneficial insects such as big-eyed bugs and some pirate bugs in this field, which confirms to previous reports of more beneficials in no-till fields compared to fields under conventional tillage. These beneficial insects (big-eyed bugs, minute pirate bugs, and lady beetles) are efficient predator of several cotton insects in the High Plains, including thrips. The added protection from environmental stresses and potential enhanced predation from natural enemies in no-till or reduced tillage production systems provide some advantages towards thrips management in cotton. AB

Figure 1A. Symptoms of thrips injury; silvery leaf on the underside of a cotyledon

Figure 1B. Symptoms of thrips injury; curling of a true leaf

Figure 2. Comparison of thrips injury to cotton seedlings

Figure 4A. Example of plant damage resulting from wind-blown sand (Courtesy: Dr. J. T. Baker, USDA-ARS, Big Spring, TX)

Figure 4B. Example of plant damage resulting from wind-blown sand (Courtesy: Dr. J. T. Baker, USDA-ARS, Big Spring, TX)

Cotton Agronomy

Stand establishment and stand loss

With cotton planting drawing to a close in southern counties in the Texas High Plains, and completed in the central and northern High Plains and Panhandle regions, producers turn their attention and energy to crop management, stand establishment issues, and in some cases, stand loss issues. Recent storms brought welcome rainfall across a wide portion of the central and northeastern High Plains, but unfortunately a couple of unwelcome friends came along for the ride. In other words, the "Good, the Bad and the Ugly" visited the Texas High Plains. Early reports of damage to young cotton seedlings have been received from Texas A&M AgriLife Extension IPM and County Ag Agents and producers across the region.

The Good - Rainfall amounts ranging from 0.3" to just over 1.5" were recorded by Texas Tech University – West Texas Mesonet stations across the area on Wednesday. Although the lower amounts provided little relief to dryland producers, those fortunate enough to receive higher amounts may actually obtain a stand of cotton. However, more rainfall will be needed in a timely manner to maintain a crop to harvest. When considering irrigated cotton fields, mostly subsurface drip (SSD), the lower amounts may just provide that little extra needed to fill in some "skippy" stands if viable seed remains. For those with good uniform stands, the extra moisture provided assistance with filling the soil profile.

The Bad – Unfortunate for some locations, the precipitation that fell was in a "frozen" state. Where promising young cotton seedlings previously stood, in some severe cases, barely visible "toothpicks" remained. With reports still coming in and warmer, sunny days needed to appropriately assess the degree of damage; it is too early to know how many acres were affected. Although discussed in the previous edition of FOCUS, this weather event provides reason to mention the "Making Replant Decisions in Cotton" again. This is an excellent publication for assisting Texas cotton producers with the difficult decisions they may face following a hail storm or other stand reducing event. Important considerations such as remaining stand uniformity and density, condition of surviving plants (including the root system), calendar date, and associated replanting costs are discussed in detail.

The Ugly – In the previous paragraph, "other stand reducing event" was included as a reason for considering replanting fields back to cotton, or other crop depending on calendar date and location. This brings us to the final Texas High Plains visitor that accompanied the storm. Extremely strong, straight, long lasting winds were experienced across the region affected by the storm. Wind gusts as high as 84 mph (Wolfforth Mesonet Station) were recorded. Where these strong winds were observed, significant damage to young cotton plants is likely. However, where cover crops are present, damage from the wind has been observed to be considerably less when compared to bare soil plantings.

Finally, if following appropriate assessment of damage the decision is made to keep the remaining cotton stand, producers should be patient and allow the seedlings to recover and be cautious before resorting to applications of foliar nutrient products to "speed up" the growth and development process. If a sound soil nutrient management program has been adhered to, the young seedlings will be provided through the root system with everything they need to recover and restart growth and development. With warmer temperatures and clear skies forecast for next week, recovery should be quick and producers can return to the task of maintaining and managing the crop for optimum yields. MSK

Cotton Disease

Probable causes for poor stands

Cotton planted the last 7-14 days is germinating rapidly and can be 'rowed' in as few as four days; however, evidence of stand establishment issues continue to be observed with some of the earlier planted fields. The most likely cause at this time is marginal or inadequate moisture required to sustain developing root systems. Furthermore, the loss of moisture or decreased water use efficiency has further contributed to poor stands. In addition, the relentless winds that have been experienced over the past week have caused damage and abrasion from blowing sand. Observations have been made were high winds have affected the deposition of irrigation water by blowing drop hoses out of the furrow or non-uniform patterns with spray pads further contributing to erratic stands and large skips. The application of irrigation water has provided sufficient moisture to incite the seedling disease complex. Both Rhizoctonia solani and Pythium spp. have been found associated with diseased tissues; however, R. solani was the predominant fungus isolated. Seedling disease symptoms, such as sunken or girdling lesions, can be observed on hypocotyls of seed that was planted too deep (>2 inches). With warmer temperatures, new fungal infections will be limited; however, plants which are severely affected may eventually die, especially as high temperatures and winds persist. Despite a slightly elevated risk for seedling disease I am not aware of any instances where replanting has occurred because of seedling disease. If you have any questions regarding seedling disease or any other cotton diseases, contact Jason Woodward at the Lubbock Center, 806-632-0762 or via e-mail jewoodward@ag.tamu.edu. JW

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Corn Insects

Fall armyworm in whorl stage corn

Fall armyworm numbers are picking up in our pheromone traps and in fact are running ahead of this time period in 2011, which was a bad fall armyworm year (see graph below).

There is not a lot of solid data on fall armyworm's ability to cause yield loss when it damages whorl stage corn. Early and mid-whorl stages are more susceptible to yield reduction by fall armyworm damage than late whorl stage. Published studies suggest that when 10 percent of early to mid-whorl stage plants have fall armyworm egg masses, then the yield loss is 7.7 percent. The loss from whorl stage damage comes from (later) reduced ear length and lower kernel number per ear. From my experience, one fall armyworm egg mass eventually results in five to seven plants up and down the row being infested with larvae, and of course the plant with the egg mass usually gets the worst damage. Thus having ten percent of the plants with egg masses would probably equate to 50-70% of the plants in the field having at least one larva. A different published study showed a 15.3 – 18.6 percent yield loss when 100% of the mid-whorl stage plants were infested by fall armyworm larvae.

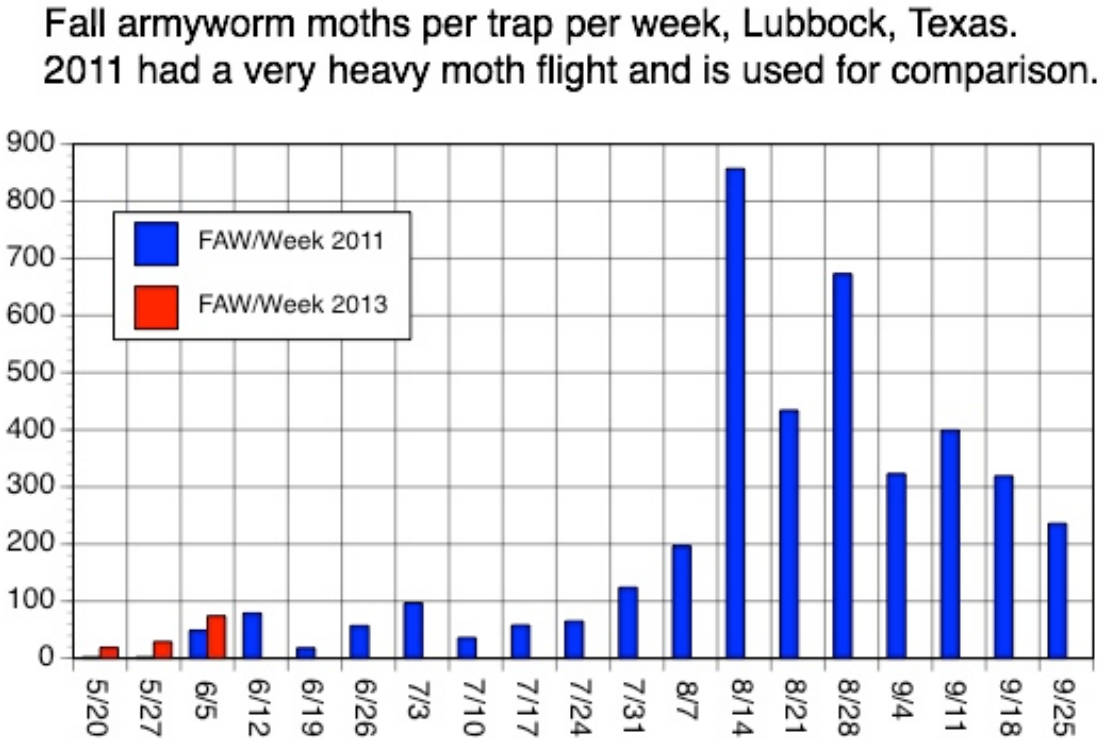
What does all of this mean? If you are growing Bt corn then probably not much. Larval damage to our pyramid toxin corn hybrids (those that have two or more toxins targeted at caterpillar pests) should be minimal. Herculex has only one toxin targeted at caterpillars and will have relatively more damage than pyramid corn (all other things being equal), but protection will still be superior to non-Bt corn. The bottom line is that Bt corn should have adequate protection in the whorl stage.

Having said this, however, if you planted Herculex corn and see significant fall armyworm damage, then please give me a call at (806) 746-6101. We are on the lookout for possible resistance in fall armyworm to the Cry1F toxin in Herculex. There has been an uptick in resistance in Florida and the Mid-South so we don't want to ignore the possibility that it might be here as well. We don't think we have any resistance problems in Texas, but we want to keep an eye out just in case it shows up.

South of Amarillo we are in the block refuge zone for Bt corn and our refuges are either 20% (for pyramid corn) or 50% (for single toxin Herculex corn). Does it pay to spray a refuge in the whorl stage? I don't know. Based on the numbers presented in the second paragraph above, when 50-70% of the refuge plants are infested in mid-whorl, then yield loss MIGHT be somewhere around 15.4 bushels. (This assumes 200 bushels/acre x 7.7 percent yield loss). However, insecticides won't kill all of the insects (they are protected in the whorl to some extent), so you won't save all of the 15.4 bushels in this hypothetical and highly theoretical example. If you decide to control fall armyworms in the whorl then stay away from pyrethroids. The first reason

is that they don't work very well on fall armyworms, and the second reason is that pyrethroids will kill the beneficial insects and pre-dispose the field to spider mite outbreaks. RPP

Fall armyworm egg mass



Non-cotton Agronomy

Hail Damage and Replant/Late Plant Decisions

With the advent of significant hail and wind damage the night of June 5, producers may find themselves already needing to evaluate damaged cotton, corn, or grain sorghum crops. Refer to the May 2 edition of FOCUS for grain crop damage assessment information, and the May 24 edition for cotton hail damage information.

I am working the update of my annual hailout/replant/late plant guide, which should be finalized the week of June 10. In the meantime, you may refer to the 2012 edition for a wide range of information on crop damage assessment, current cropping options moving forward, and how late you can plant if hail, wind, or drought places you in a replant or late plant situation. See the document at:

Purpling in Grain Sorghum Seedlings

Occasionally, grain sorghum seedlings growing in early cool conditions, especially if prolonged and coupled with cloudy weather, will demonstrate pronounced purpling of the leaf sheaths and leaf margins/leaf blades (see photos below). This may be coupled with interveinal yellow striping (chlorosis) related to iron deficiency. The purple color occurs from the accumulation of anthocyanin in the tissue and results from insufficient phosphorous uptake or from the plant's inability to move sugars from the leaf blade ("Sorghum Growth & Development, Texas A&M AgriLife Extension, B-6137). Symptoms usually disappear when favorable temperatures return. These conditions can occur throughout Texas whether you are planting in early March in the Coastal Bend or in early May in the High Plains. You have not done anything wrong with P nutrition for your sorghum crop. The seedling in the left picture is at leaf stage 4 and has only recently developed sufficient roots to drive the growth and acquire P beyond what may have been available in seed reserves.

If you find a field with the purpling color and you have had cool conditions, it is advisable to re-check the field ever few days as warm weather resumes to track the return to normal colored tissue. Look for the newly emerging leaf to be green in color. As long as the plants are otherwise healthy yield potential is generally not compromised though it is possible individual plants might appear stunted.

Could this be herbicide injury? In some cases when pre-emergent chloroacetamide herbicides (Dual, Lasso, Frontier) were applied, rain or irrigation may have moved the chemical into the root zone. Under cool conditions the plants absorb more chemical, and some purpling may occur. Like the above scenario, the return of warm conditions and good growing conditions will diminish the symptoms and injury potential.

How does cool-induced purpling compare to conventional P deficiency? P-deficient sorghum plants are stunted, spindly, and dark green with overtones of dark red on the leaves. The red pigment first appears on older leaves and characteristically progresses upward toward younger leaves. Interveinal (between veins) tissue is sometimes red separated by green veins. On individual leaves redness first appears on the leaf tip and margins then progresses toward the base and midrib of the leaf.

Availability of Grain Sorghum, Sorghum/Sudan, & Forage Sorghum Seed

Though seed supplies for all sorghums have been tight to non-existent since last fall, some seed companies are reporting limited availability of some hybrids. Don't expect to find your preferred hybrid. Some dealers in particular now report that they have some sorghum/sudans (haygrazers) and forage sorghums available. Do make a few phone calls if you are needing seed.

When should I stop irrigating wheat?

Most years we are likely done with wheat irrigation by this time, and even with the late crop that has experienced numerous freeze damage, many fields are still finished irrigating. But if you have a field that has a high number of late tillers, there still may be a question of how long to carry the irrigation. Yield potential may be low enough to not support continued irrigation (a seed block might be an exception) as you wait for very late tillers to produce grain.

Normally wheat moves through seed development and maturation from watery ripe to milk stage to an intermediate stage I call 'mealy ripe' then soft dough and finally hard dough. In the 'mealy' or gel stage, when you squeeze the seed, it does not squirt, but you can force a gel-like material out. For wheat that is well into the milk stage in the kernel, if soil moisture is good, then there is probably not much benefit of irrigating any more. Milk stage to soft dough can be 7-10 days. If only modest soil moisture exists while in the mealy stage, then water once more, especially if hot. As a rule of thumb on wheat, if your gut tells you that you need to water one more time, then I would do it. CT

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Useful Web Links

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

County IPM Newsletters

Castro/Lamb, Dawson/Lynn, Crosby/Floyd, Gaines, Hale/Swisher, Hockley/Cochran, Lubbock, Parmer/Bailey, Terry/Yoakum