

# FOCUS on South Plains Agriculture

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

## August 25th: Subsurface Drip Irrigation Field Day

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Bollworms and aphids relatively low  
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## Subsurface Drip Irrigation Field Day

Research updates, maintenance and management will be the focus of a Subsurface Drip Irrigation Technology Field Day to be held at the Texas AgriLife Research Farm and Helms Farm on **Tuesday, August 25**. Speakers from the Texas AgriLife Research and Extension Service, USDA Agricultural Research Service and Natural Resources Conservation Service, and Kansas State University will present information on SDI management for corn and cotton production, irrigation system layout, components, performance, maintenance and troubleshooting. Industry representatives will be on hand with product information, and informational exhibits and materials will be available to assist producers further in getting answers to their SDI questions. Registration will start at 9 am, and the tour will begin at 9:30 am at the Helms Farm. Halfway is located on Highway 70 approximately 11.5 miles west of I-27 (exit 49 at Plainview). The Helms Farm is located on Ranch Road 1070/County Road I, two miles south of the Research Center at Halfway. For more information, please contact Dana Porter at [d-porter@tamu.edu](mailto:d-porter@tamu.edu) or phone 806-746-4022 (please leave a message). [The agenda is available here](#). DP

## Cotton Insects

### Lygus

Lygus are becoming more prevalent throughout the region, mostly in low, sub-economically damaging levels. However, we are picking up high numbers in some locations. The highest populations I am finding have primarily been near recently cut alfalfa, but not always. Just because you are not near

an alfalfa field, don't think that you don't have Lygus; you are just more likely to have them if you are 1 mile or closer to an alfalfa field that has been cut within the past 2 weeks. Most heavily infested fields are running 8-12 Lygus per 6 ft-row based on drop cloth sampling. The threshold at which you should consider treating for Lygus time of year is 4 Lygus per 6 ft-row based on drop cloth sampling, or 15-20 Lygus per 100 sweeps.

Adult Lygus appear to be very transitory, moving into the field, laying eggs and vacating within a few days. These populations are easily missed, and what we are detecting in the cotton are populations comprised of about 80% nymphs and 20% adults. Be careful, small Lygus and small cotton fleahoppers are very difficult to tell apart. If you have a lot of very small plant bugs and you are not sure if they are Lygus or fleahopper, don't panic and spray. At this point in time of the season the small Lygus are not likely to be able to cause much damage. Their mouthparts are simply too small to consistently pierce the carpal wall of the boll. Fields I have been in that were infested with very small Lygus had plenty of bolls with external stings, but none of these stings went through into the inner boll to cause damage to the lint. So, if you have a lot of small Lygus and/or fleahoppers and you can't tell what is what, wait a few days for the Lygus to gain a little size and then you will be able to get an accurate assessment of the population. [Click here to see the Lygus life stages.](#) [Click here to see the cotton fleahopper's life stages.](#)

### **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 depends on size of fruit and size of Lygus. For instance, research has shown that 1<sup>st</sup>-3<sup>rd</sup> instar Lygus nymphs 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 (this is a boll about 1-inch in diameter), it is no longer considered susceptible to Lygus damage. So essentially we need to protect those bolls that are 1-inch in diameter or smaller and capable of maturing.



*Dark speckling 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. Now 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 often be aborted by the plant, especially if the boll has multiple feeding sites on it. Last year we were able to show that cotton could suffer a loss of as much as 235-lbs of lint due to Lygus feeding on small bolls in late August through early September.

### **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. We are fortunate here; other parts of the U.S cotton belt have Lygus populations that are resistant to some insecticides. Our 2008 tests showed products that had good activity towards Lygus included Ammo, Orthene, Vydate, Carbine and Diamond. 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.

One thing to be wary of when selecting a product for Lygus control is its impact on beneficial insects and the likelihood of flaring a secondary pest 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. [Click here to view the a Lygus insecticide table.](#)

### **Bollworms**

Bollworm numbers are still relatively low across the region, but I would be watching closely for an egg lay. I expect we will have one in the next few weeks.

### **Aphids**

Aphids can be readily found in a majority of fields, but in very low numbers. I have yet to come across a population that was even close to being problematic. With much of the cotton cutout or near cutout, I do not expect aphid populations to take off, especially with the high number of beneficials we are seeing. However, if you treat bollworms or Lygus with broad spectrum insecticides such as a pyrethroid, you may very well flare these aphids to damaging levels.

### **Fall Armyworms**

Fall armyworms are being picked up in moderate numbers in non-Bt cotton in Gaines County. They may be in other areas, but I can't be certain. The worms we have been seeing have been feeding primarily in the blooms. If you have Bt cotton, and notice fall armyworms feeding in the blooms, watch them closely. Bollgard II or Widestrike varieties do have ac-

tivity towards fall armyworm. But the blooms do not express the Bt toxin as high as in other portions of the plant and under very high populations enough worms may survive long enough to gain enough size to take a small boll or two before dying. If you are growing an older Bollgard variety (not BG2), watch these fields very closely; research has shown that Bollgard is not very effective towards fall armyworms.



*Fall armyworm feeding in a bloom*

Unfortunately we do not have a research based threshold for fall armyworms, but we do have some good guesses based on experience. This late in the season in non-Bt cotton, if you are picking small (< ¼ inch long) fall armyworm in the upper portions of the plant feeding in terminal tissue or blooms, then 8,000-10,000 worms per acre is a good threshold. However, if the worms are feeding deep in the canopy or if they are larger than ¼ inch in length, then a threshold of 5,000 worms per acre is probably a better choice. If possible target these worms while they are feeding in those upper blooms and exposed. Once they start moving into that canopy, good coverage and control may be difficult.

Currently, we do not have much information on insecticide efficacy towards fall armyworm in cotton. However, Intrepid and

Tracer have both demonstrated good activity in the past. Pyrethroids are weak against fall armyworms, especially if the worms are deep in the canopy or have much size to them. If you have a mix of fall armyworms and bollworms, a pyrethroid should kill the bollworms but will miss the armyworms. Intrepid and Tracer on-the-other-hand are weak on bollworms but much better on fall armyworms. Belt or Coragen may prove to be good alternatives. They both have shown activity towards armyworms and although somewhat weaker, they do have activity towards bollworms. However, we do not have much data on these products; none for fall armyworms in cotton. Regardless of what you use, maximize coverage and again, try to target those worms while exposed in the blooms in the upper portion of the plant. All of the fall armyworm products mentioned above are most effective if eaten by the worm. Tracer, Coragen and Belt all have translaminar activity. This means that the plant tissue will absorb them and then when that portion of the plant is eaten, the worm will consume the poison. Intrepid is not translaminar and thus tends to be more coverage sensitive. For Intrepid, the worm must eat the product off the surface of the plant tissue. DLK

## Cotton Agronomy

### Crop Update

The August 12 USDA report has Districts 1N and 1S at 3.34 million acres planted, up from the earlier report's 3.16 million acres. Based on their estimates of abandonment which many believe is somewhat high at about 730,000 acres lost, we are looking at about 2.61 million acres to harvest. From this standing acreage, it is estimated that per acre lint yields will be 1006 lb/acre in 1N, 713 lb/acre in 1S. This in turn results in a crop of about 4.1 million bales. There is a lot of good irrigated cotton out there, and some decent dryland. We certainly need a good rain event across many of the late dryland acres to help boost our production. There is considerable

discussion relative to another 4 million bale crop in the area. We have a ways to go yet, but it is looking substantially better than last year's 2.9 million bales off of about 1.9 million acres in 1N and 1S. Remember, we failed about 1.36 million acres last year. However you look at the 2009 crop, it is certain that we are in much better shape than in 2008 in terms of standing acres. Let's hope we get a good finish to this crop.

Thus far, August has been rather hot with not a lot of rainfall across the region. Heat unit accumulation at Lubbock has been 17% above the 30-year long-term average from August 1 through 20 ([click here to view August temperatures](#)). We are rapidly moving into hard cutout in a lot of fields, with some irrigated fields at less than 5 nodes above white flower (NAWF) at this time.

### Countdown After Cutout

Some fields have recently reached cutout (here defined as Nodes Above White Flower or NAWF=5 on a steep decline followed by "hard cutout"). COTMAN uses 850 heat units past bloom as a point at which a bloom can make a "normal" boll. In the High Plains, heat unit accumulations of 750 past bloom will probably make an "acceptable boll" that may not have "normal" lint production and may be lower quality (low micronaire).

We have developed a table that indicates where we are as of August 20 (Table 1). It is based on actual Lubbock 2009 heat units from August 1, and August 10, and from August 20 forward, it uses "temperature normals" (30-year long-term average) as projections for each day.

For example, the table shows that for a field that reached cutout on August 10, that bloom should be able to obtain 350 heat units (probably safe from Lygus) by about August 28. The 450 total (probably safe from a bollworm egg lay), should occur around September 4. If we encounter "normal" heat units from August 21 forward, this boll should obtain good maturity (850 heat units) about October 24.

Based on some irrigation termination projects with COTMAN (see below), the possible irrigation termination date could occur sometime around September 8. One can tell that unless we have an outstanding fall, the cotton blooms on August 20th at Lubbock will encounter difficulty in making a "fully mature boll." [View Table 1 here.](#)

### Late-Season Irrigation Issues

The value of continued center pivot irrigation after bolls begin to open is probably questionable, unless record high temperatures and high reference ET are encountered and the field has a depleted moisture profile and a late boll load. Generally, depending upon temperatures, 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. Recently, ET rates have been running about 0.25-0.33 inches/day. As we move into the boll opening growth 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 decreases rapidly after that. That implies that once we get to the 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). For information on the amount of irrigation available/week for varying irrigation capacities provided by Jim Bordovsky, Texas AgriLife Research Irrigation Engineer, [see Table 2.](#)

A rod probe or other tool may be useful in determining the amount of moisture remaining in profiles in fields. Water holding capacities of major High Plains soils are found in [Table 3.](#)

### 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 400 600 DD60 heat units past cutout (here defined as Nodes Above White Flower or NAWF = 5 on a steep

decline with "hard cutout" following) has been reasonable in some areas. One lower yielding 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 subsurface drip irrigation (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 as a guide.** With center pivots, low amounts of irrigation (0.75-1 inch) can be applied if the cotton is severely stressed after initial termination. Some fields which have fairly depleted profiles may wilt soon once irrigation is interrupted. If the amount of wilting is unsuitable for the boll load, then the pivot can be passed over the field to apply an additional increment of water.

### 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 applications 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.

### 2009 Harvest Aid-Guide

We are now working on getting the High Plains and Northern Rolling Plains Cotton Harvest-Aid Guide updated. This will be

posted on the Lubbock Center Web site when it becomes available, hopefully within the next two weeks.

### Mark Your Calendars: 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:

- Bailey County Crop Tour, 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

Texas AgriLife Research Subsurface Drip Irrigation Field Day, Helms Farm - Halfway, August 25.

West Texas Agricultural Chemicals Institute Annual Meeting, September 16  
There is another excellent program planned. For a copy of the program and/or to register online, go to <http://wtaci.tamu.edu>  
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 website](#).

## Company Field Days

- Monsanto/Deltapine Technology Showcase Field Day, September 22 (consultants) and 23 (producers)
- Bayer CropScience Field Day, October 1 and 2
- Americot Field Day, September 22
- All-Tex Field Day, October 7 RKB

## Wheat Agronomy

### Wheat Variety Recommendations for Grain

Extension continues to receive many inquiries on wheat varieties. Dr. Brent Bean, Extension agronomist, Amarillo, compiles a running summary of wheat variety recommendations for the Texas High Plains on an ongoing basis. Industry seed suppliers note, however, that some varieties will be in short supply so check with seed dealers soon to book a particular variety.

For any wheat seed, we do recognize the advantages of certified seed. Texas Dept. of Ag. has checked the seed lot for weed seed, germ, etc. Any wheat seed, regardless of origin, should have a germ of at least 85% and a test weight of at least 58 lbs./bushel.

For 2009, Dr. Bean notes the following selections for wheat variety recommendations.

Full Irrigation: TAM 111, TAM 304, Dumas, Hatcher, Endurance, Duster

Limited Irrigation: TAM 111, TAM 304, TAM 112, Hatcher, Endurance, Duster

Dryland: TAM 111, TAM 112, Hatcher, Endurance, Fuller

Varieties recommended by Brent Bean here are those that have consistently performed well over at least a three-year period. Those varieties that perform well under full irrigation also tend to be the same varieties that yield well under dryland. In our environment,

even those varieties grown under full irrigation are going to be subject to heat stress and likely some periods of drought. Over the last four years, *Hatcher* and *TAM 111* have consistently been top varieties in all of our trials. These varieties should be considered for all environments in the Texas High Plains. Greenbug tolerant *TAM 112* is a very good dryland or limited irrigated variety. Under full irrigation some lodging can occur, and thus it does not make the list for full irrigation. *Endurance* and *Duster* are very seldom the top variety in any given trial, yet these Oklahoma State varieties consistently are in the top 25% of most trials. *Endurance* is especially a good choice as a dual-purpose wheat for grazing and grain production. This was not a good year for *Fuller*. However, its performance in previous years warrants it remaining in the recommended list for dryland production. Likewise, *TAM 304* did not yield as well in 2009 as in previous years, but its history warrants it being considered under full or limited irrigation. Planting *Dumas* has long been recommended under full irrigation and it is still a consistent performer under those conditions.

### How have these recommendations changed from recent years?

Overall the wheat variety 'picks list' does not usually change much from one year to the next as we usually need three years of performance testing before we would recommend a variety. This year, for 2008 picks however, there were some changes as compared to 2006 and 2007 picks.

Deletions from the 2007 & 2008 recommendations:

Full irrigation: Jagalene and Trio Research' "T81" was deleted in 2007, and Fuller was removed from the 2008 recommendations as its performance has waned from earlier yields.

Limited irrigation: Jagalene, T81, and Dumas were removed in 2007, and Fuller was

removed in 2008 though performance is still fairly good.

Dryland: Jagalene and T81 have been deleted.

A note about Jagalene: This variety has been on our picks list for irrigated to dryland for several years. Jagalene did not perform well in the 2007 harvest, but did well in 2008 High Plains trials, and about average in the 2009 harvest. Depending on what other varieties are available this variety is still probably a decent pick.

Other well-known wheat varieties that have been recommended picks in the past:

TAM 110 was a good pick for limited irrigation and dryland, but this greenbug tolerant wheat variety has been superseded by TAM 112, which has slightly better yields and grain quality and retains the greenbug tolerance and offers better overall disease resistance. It is worth paying a few dollars more per acre to plant TAM 112 over TAM 110.

TAM 105 has been off the dryland list for many years now, but it is still planted on a significant number of acres. Seed sources may no longer be pure. This variety has clearly been surpassed by newer genetics. One factor that keeps a significant amount around is that TAM 105's Plant Variety Protection has expired.

Jagger has been off the irrigated and dryland list for several years now. It is a parent to Jagalene, which does not break dormancy and potentially suffer from late spring freezes, the way Jagger does. In normal years Jagger is still a good wheat, but the tendency to break dormancy early creates unnecessary risk. Jagger may benefit from heavy grazing to potentially delay maturity and susceptibility to freeze injury.

### **Five-Year Irrigated Wheat Variety Summary, Gaines/Yoakum Counties**

Extension has compiled a five-year summary of grain yields for the southwest South Plains. Results, including additional information on the yields of beardless wheats and NK 812, which are yielding significantly lower than recommended varieties, will be discussed as well in the next issue of FOCUS.

### **Wheat Seed & the Plant Variety Protection Act**

Strict law governs what producers can and cannot do if they purchase a protected variety of wheat seed and choose to harvest and save some for their own use to plant the following year. Almost all wheat varieties are protected. The few I know of that are not—they are very old and no longer recommended—include TAM 105 (old variety, protection expired), TAM 200, OK 101, OK 102. Several beardless wheats are not protected. The law states that you may only save enough of a protected variety to plant your own fields, and you may not sell any of it, even if you call it 'Variety Not Stated' (VNS). You as a buyer have the right to ask anyone if they are selling you a protected variety.

Some farmers will plant 'elevator run' seed for cover, grazing, or grain. Anywhere in the South Plains you could not obtain elevator run seed without having at least some protected varieties of wheat in the mix. So legally you would be liable to pay royalties if your wheat was tested and found to contain a protected variety. Producers and elevators do not like to hear this, but one much understand the implications. I can give you another reason—a good one—to not plant elevator run wheat: ensuring that you are getting a known variety! Elevator run wheat will not be checked for test weight (can be done easily enough though), germination, seed-borne disease contamination, weed seed, etc. (certified seed is tested for these). And you won't have a seed treatment either.

For further information on how the Plant Variety Protection Act applies to wheat read the [Texas AgriLife Extension Service bulletin](#) on the web.



## When Can I Stop Irrigating Grain Sorghum?

When can I stop irrigating grain sorghum? As a rule of thumb if good soil moisture is still available to the plant—at least 1-2”—then terminate near soft dough. The sorghum seed will proceed through grain development from watery ripe to milky ripe to mealy ripe then begins to firm at soft dough on to hard dough. Then physiological maturity occurs at black layer, the appearance of a black dot on the tip of the seed. This usually occurs about 10-12 days after soft dough under warm conditions. Overall grain sorghum usually takes about 30-35 days from flowering to physiological maturity.

Seed moisture at black layer is ~25-35%, but harvest must be below 20% moisture with drying required. Grain can be harvested without drying at 13 to 14% grain moisture to avoid dockage (depends on delivery point).

Be sure to check many heads and check the whole head. Some difference in maturity will be observed on each head as seeds at the tip could easily be 7 days older than seeds at the bottom of the head. Sorghum flowers at the tip first then moves down, and there could be as little as four days difference in flowering and pollination for a small head to as much as nine days for a large head.

## Can I use the color of the grain sorghum head to determine irrigation termination?

Not reliably. You still need to do a hands on check of the heads. Turnrow observations of sorghum fields do not tell you how much soil moisture is still available, which could be from none to an amount that is more than twice what you may apply in one irrigation. Head coloration may vary depending on hybrid as some 'red' sorghums are not as red as others.

My observations over the past couple of weeks suggest in general when the seed in the head begins to take on an orange or reddish tint, the seed is most likely at the milk stage. As a field turns color such that you readily

observe it while driving down the road then the sorghum grain tends to be in the mealy stage to perhaps just entering soft dough. But this is not a reliable means of deciding to irrigate again unless you check for available soil moisture and the seed stage of growth. Irrigation specialist Leon New, Texas AgriLife Extension Service, Amarillo, has noted that little to no increase in yield is likely after a general red color appears over the field but an additional late season irrigation might help maintain stalk quality for harvest.

An additional grain sorghum irrigation resource has been prepared by former Texas AgriLife Extension Service irrigation specialist Leon New, Amarillo, "[Grain Sorghum Irrigation](#)", and additional information from Kansas State University notes [key considerations for grain sorghum in deficit irrigation](#), CT

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## Insect Trap Captures

### Trap Captures as of August 19th

- [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.](#)

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## Useful Web Links

[Applied Research Reports \(Goldmine\)](#)  
[Texas High Plains ET Network](#)  
[Irrigation at Lubbock](#)  
[Pest Management How-To Videos](#)  
[Lubbock Center Homepage](#)  
[Texas Agricultural Experiment Station Home](#)  
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[Plains Cotton Growers](#)

## County IPM Newsletters

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