FOCUS on South Plains Agriculture

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

Sunflowers at sunrise, Lubbock Research Center. Photo Credit: Patrick Porter

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http://lubbock.tamu.edu/focus

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Agronomy Update

The August 12 USDA report has Districts 1N and 1S at 3.7 million acres planted. Based on their estimates of abandonment, we are looking at about 1.85 million acres to harvest. From the remaining acres, it is estimated that approximately 2.6 million bales will be produced. There are some very good fields of irrigated cotton around the region that should help us reach that level. However, there are still some fields that are late in development and will need a lot of help from an open warm fall to mature set bolls. The remaining dryland acres scattered about are in varying levels of condition ranging from very poor to fair.

Temperatures have been excellent throughout August and thus far in September. Heat unit (HU) accumulation for Lubbock is about 11% above normal for this time of year with 2271 HU compared to 2046 HU for the long term average. The forecast for September is for warmer than average temperatures. This would greatly benefit later cotton in terms of maturity and yield. According to the Weather.com website, the High Plains region has an equal chance of seeing above or below normal rainfall through September.

Cotton After Cutout

After reaching hard cutout (≤4 NAWF) and "blooming out the top", producers should can track HU's in order to determine when the crop is "safe" from particular insect pressures and also when to consider irrigation termination and harvest aid applications. At 350 HU past cutout, bolls are considered safe from Lygus, for example. Other HU insect safe thresholds are included in the table below.

	Date When Crop Achieved Cutout (5 NAWF)		
DD60 Heat Unit Accumulation	**Aug 1**	**Aug 10**	**Aug 20**
+350 HU (safe from lygus)	Aug. 17	Aug. 28	Sept. 13
+ 450 HU (safe from bollworm egg lay)	Aug. 22	Sept. 3	Sept. 22
+ 500? (terminate irrigation if no rainfall?)	Aug. 25?	Sept. 7?	Sept. 28?
+ 850 HU (mature boll)	Sept. 20	Oct. 20	N/A
Total HU through Sept. 30	937	745	516
Total HU through Oct. 15	1023	832	603
Total HU through Oct. 31	1069	877	648

Based on irrigation termination work conducted in Texas, producers should look seriously at using about 500-600 heat units past cutout as a decision aid for terminating irrigation. In the previous Agronomy Update, I provided other methods for making this decision and where to locate more information. As cotton matures, its moisture demand decreases from approximately 0.4"/day at "Peak Bloom" to less than 0.2"/day under normal conditions. The amount of additional moisture required (irrigation/rainfall) will vary greatly from field to field based on soil type and current soil profile moisture. Ideally, the soil profile should be depleted of moisture in the root zone at the time the crop reaches an acceptable level of maturity (uppermost harvestable boll near full maturity). Determining current soil moisture can be difficult, but there are instruments and methods available to assist producers. A rod probe, shovel or other tool may be used in determining the amount of moisture remaining. Water holding capacities of major High Plains soils are found in Table 2. A publication by the High Plains Underground Water Conservation District No. 1, "Estimating Soil Moisture by Feel and Appearance" can be useful.

Table 2. Average available water holding capacities for typical High Plains soils.

Soil series	**Dominant texture**	**Available water holding capacity in inches of water per foot of soil depth**
Amarillo fine sandy loam	sandy clay loam	1.8
Amarillo loamy fine sand	sandy clay loam	1.7
Arvana fine sandy loam	sandy clay loam	1.8
Brownfield fine sand	sandy clay loam	1.4
Portales fine sandy loam	sandy clay loam	1.6
Acuff loam	sandy clay loam	1.9
Olton loam	clay loam	2.0
Estacado clay loam	clay loam	1.6
Pullman clay loam	clay	1.8
Miles fine sandy loam	sandy clay loam	1.8
Ulysses clay loam	clay loam	1.6
Mansker loam	clay loam	1.8
Lofton clay loam	clay	1.9

Data from High Plains Underground Water Conservation District Number 1 and NRCS.

Cotton Harvest Aids

Another decision that producers face is when to apply harvest aids. Several methods are useful in making this determination. The “percent open boll”, “sharp knife”, and nodes above cracked boll (NACB) methods are widely used as well as the “850 HU’s past cutout” method by the COTMAN program. Any method can be used, however, I prefer to use two methods simultaneously when making timely harvest aid application decisions. Generally, once a crop has reached 60 – 70% open bolls, 4 NACB, or if brown seed coats and fully developed cotyledons are observed in the seed after cutting the boll,it is safe to apply a boll opener/defoliant tank mix. However, for some lower yielding cotton crops, producers may opt to apply a single application of a desiccant to terminate. In this case, we recommend the crop be at least 80% open with 2 NACB at the time of application. More information on harvest aids, along with making yield estimations, will be discussed in the next issue of Focus. MSK

Cotton Disease

Verticillium Wilt has made its presence felt in many fields in late August

All varieties are showing strong symptom development, however, there are some varieties that show fewer symptoms than others. Each year, the Cotton State Support Program funds variety trials in Verticillium wilt fields. Included in Table 3 is the average wilt incidence

ratings of the entries tested for 2013. With all the seed-industry field days coming up this month, cotton producer's with significant Verticillium wilt problems may want to check out some of the newer varieties and advanced breeding lines. Results from last year, which include yield, can be found here.

The pathogen plugs up the channels that the plant uses to move water from the roots to the leaves. So if plants are showing symptoms they are likely not able to move much water through the stem. While you may not want to shut off your pivots completely, you are not getting full value for the water that is being applied.

Things to consider for the next growing season: variety; planting a higher seed density (4 seed or more per ft. of row with 40-inch centers); limiting your irrigation, particularly if you get some cool spells in late July or August. Subsurface drip irrigation on 80-inch centers, where the producer is careful to NOT wet the soil up close to the surface, has been found to reduce the severity of Verticillium wilt dramatically. We think that practices that cool the surface (top 4-inches) soil tend to increase Verticillium wilt, though this theory is still to be tested. Terry Wheeler

Table 3. Incidence of Verticillium wilt in 2013 for cotton varieties and breeding lines.

Variety[1]	Incidence[2] of Wilt (%)	Variety[1]	Incidence[2] of Wilt (%)	Variety[1]	Incidence[2] of Wilt (%)
FM 2484B2F	24	PHY 565WRF	33	CT 13125B2RF	38
BX 1422GL	25	PHY 375WRF	34	DP 0912B2RF	38
FM 9170B2F	25	NGX 2322B2RF	34	AM 1532B2RF	38
FM 9250GL	25	DP 1321B2RF	34	BX 1445GLB2	40
DP 1044B2RF	26	PHY 339WRF	34	PHY 4433-27	40
FM 2011GT	28	CT 13883	35	PHY 499WRF	41
PHY 367WRF	28	PHY 4433-25	35	ST 6448GLB2	41
BX 1347GLB2	28	FM 9180B2F	35	All-Tex EdgeB2RF	42
NG 3348B2RF	29	NGX 3306	35	CG 3428B2RF	43
FM 2989GLB2	29	NG 1511B2RF	36	AM 1504B2RF	43
DP 1359B2RF	29	PHY 3080-1	36	CG 3156B2RF	44
DP 1219B2RF	30	ST 4946GLB2	36	CG 3787B2RF	44
NG 4012B2RF	30	BX 1320GL	36	CT 13663	46
All-Tex Nitro-44B2RF	31	DP 1311B2RF	37	NG 5315B2RF	47
FM 1944GLB2	32	CT 13545B2RF	37	CT 13363B2RF	47
NG 2051B2RF	32	NG 4010B2RF	37	CT 13513RF	50
NG 4111RF	32	DP 1212B2RF	38	DP 1252B2RF	53

[1]AM=Americot; BX=experimental line from Bayer CropScience; CG=Croplan Genetics; CT=experimental line from All-Tex; DP=Deltapine; FM=Fibermax; NG=NexGen; NGX=experimental line from NexGen; PHY=Phytogen; ST=Stoneville.

[2]Trials were conducted at five locations (Halfway, Plainview, Floydada, Ropes, and Garden City). FM 2484B2F, FM 9180B2F, AM 1504B2RF, and DP 0912B2RF were planted at all five locations (highlighted in yellow), all other entries were planted at a subset of these five locations.

Cotton Insects

Late season cotton insect pests in the High Plains

It is just over two weeks since the most of our cotton in the High Plains attained the physiological cut-out stage, i.e., 5 nodes above white flower (5-NAWF). This is one of the important landmarks used for managing the cotton crop. Several management decisions such as irrigation, plant growth regulators, and control of insect pests are made based on the cut-out date. From an insect pest management perspective, we should watch closely the accumulation of heat unit (HU) after the physiological cut-out date. By following HU accumulation we can predict the boll maturity and potential risk from the late season insect pests in cotton. If we consider August-15 as our normal cut out date, then we can calculate how much heat unit we have accumulated after that date. For example, in Lubbock, HU accumulation after August-15 is:

Date	HU accumulation
August-16	32.0
August-19	86.0
August-22	142.0
August-25	202.5
August-28	252.0
August-31	316.5
September-3	382.0

Of course, the cut-out date and HU accumulation will vary from location to location within the High Plains. Therefore, based on the daily high and low temperatures in your location, you can calculate the HU accumulation and use this information for managing your cotton.

There are few late season insect pests in our High Plains cotton currently on my radar. Following is the list of these late season insect pests and how their management relates to the HU accumulation:

Bollworm/Fall armyworm: This is more applicable to non-Bt cotton fields. In several non-Bt cotton fields, mixed populations of bollworm and fall armyworm at above economic threshold level were observed and received insecticide applications. I would like to discuss the use of insecticides to control bollworms/fall armyworms. Although it may be cheaper and sometimes you may get effective control of bollworm population with pyrethroids, it is recommended not to use pyrethroids in late season cotton, especially cotton close to boll opening. Therefore, it would be safe to stay away from pyrethroids if possible. In terms of HU, cotton bolls which are beyond 350 HU are safe from bollworm injury.

Cotton aphids: As mentioned above, use of pyrethroids to control bollworms is not recommended. This is because, pyrethroids can flare or increase the aphid populations in cotton. I have witnessed very low populations of cotton aphids in most of the area cotton. They are under check by presence of abundant beneficials. Pyrethroid applications can reduce the beneficial population and thus help the number of cotton aphids to increase. Besides, research indicates that there is an effect (called hormoligosis) of pyrethroid insecticides on aphids, which increases the population by hastening developmental time. Usually there is no HU limit to indicate when cotton is safe from cotton aphids. Because, besides feeding on the leaf and terminals, heavy aphid populations result in sticky cotton by contaminating lint with their honeydew. Therefore, cotton aphid control becomes a priority from both yield and lint quality in late season cotton.

Lygus and stink bug: I have seen increased number of Lygus in several cotton fields at this time. Not so much for stink bug, but there are few out there. This year, Lygus bugs have been found in higher numbers in Hale and Swisher counties compared to other High Plains locations. There are several fields that have already received insecticide applications for Lygus bug. So, cotton could still be susceptible to both Lygus and stink bug injury if bolls have not passed 450 HU. Therefore, scouting should be continued on those fields where bolls are below the 450 HU limit. AB

Corn and Sorghum Insects

Fall armyworm (and sorghum headworms)

We are still concerned about sorghum that is not at hard dough stage. Blayne Reed and Gary Cross, Hale County IPM Agent and Agriculture Agent, respectively, are reporting lower trap captures of fall armyworm adults this week, but the counts at Lubbock have jumped up. Blayne is reporting finding fall armyworms in sorghum heads and said approximately 20% of his program fields have required treatment for headworms. He is also reporting a shift from corn earworm being the most abundant species to fall armyworm being the most abundant. As discussed in the August 30th edition of FOCUS, when fall armyworm is the most abundant species the suggested insecticide options change.

Sorghum should be scouted until hard dough. Thresholds and scouting procedures are presented in Managing Insect and Mite Pests of Texas Sorghum, but feel free to skip this resource and just download Monti Vandiver's excellent sorghum headworm apps for your smartphone or tablet. An Android based threshold calculator can be found at the Google Play Store; http://goo.gl/8mXvv . Monti also has a web app for other operating systems (including standard computers) which can be accessed at http://goo.gl/5k7ZtU .

Wheat that will be emerging soon will be an especially attractive place for fall armyworms to lay eggs and it should be scouted from emergence until frost.

Corn is technically susceptible to fall armyworm until harvest, but our work last year showed that the major vulnerability is from tassel through formation of the starch layer. After that the larvae can continue to eat kernels, but much, much more slowly that with softer kernels. Corn that has not yet formed a good starch layer is at significant risk but there is no way to get the insecticide to the insects when they are already in the ear.

Yellowstriped armyworm watch

Unusually high numbers of yellowstriped armyworm larvae are consuming pigweed (careless weed), sunflowers and peas on the Experiment Station and, once done with these, they may move to other host plants. The known host range includes cotton, sorghum, wheat, sunflower, corn, alfalfa, bean, peas, tomato, watermelon and many other plant species.

We don't know how widespread this infestation is. Manda Anderson and Kerry Siders are reporting very low numbers in Gaines and Hockley/Cochran counties, respectively. Monti Vandiver is finding some in Bailey and Parmer counties. Mike Blanton, former IPM Agent in Parmer and Bailey counties and now farming near Stinnet, called and said legions of yellowstriped armyworm larvae were rapidly defoliating his pigweed and would probably move to sorghum once they finished with the weeds.

Yellowstriped armyworm larva. Photo Pat Porter

Another little tan moth comes to the party

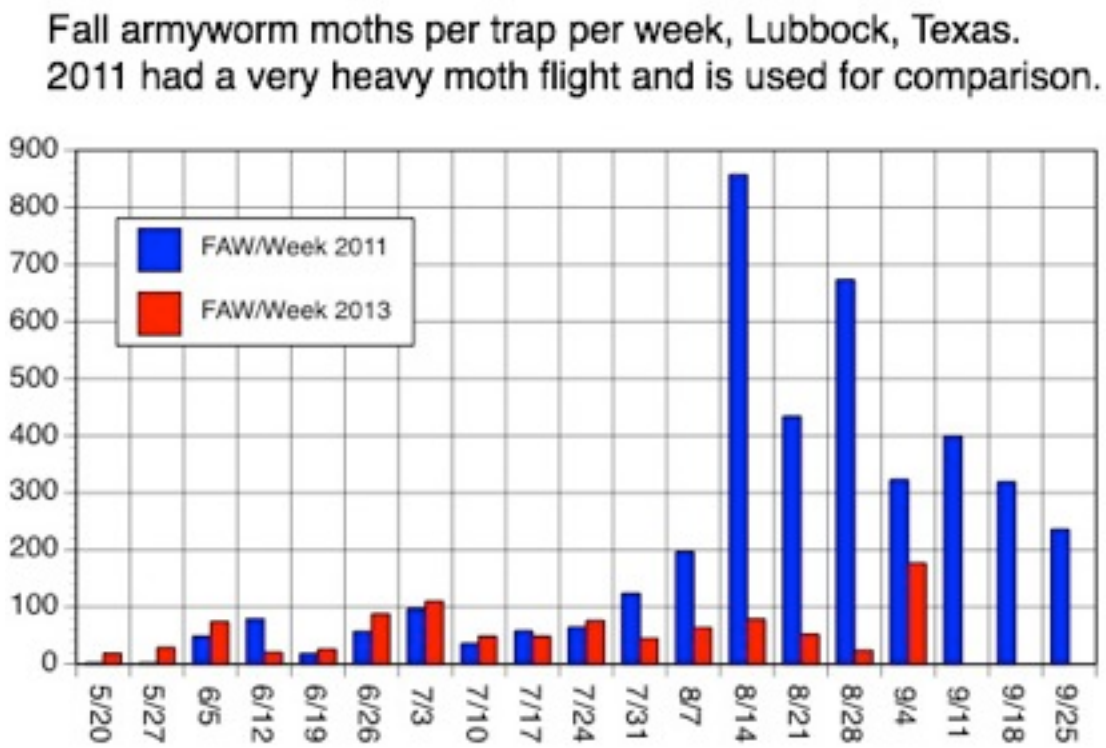
Blayne Reed and Ed Bynum collected larvae from pigweed this week and we have identified these as garden webworms. Manda Anderson, IPM Agent in Gaines County, wrote of high numbers of garden webworm larvae last July and it looks like they are now widespread. Thus the little tan moths we are seeing now and may see more of in the next few weeks can be garden webworm or smartweed borer or perhaps even some other species we have not identified. European corn borer looks quite similar but it has not recovered from the severe population declines caused by Bt corn. RPP

Little tan moths in the area. All photos courtesy of Bugguide.net.

garden webworm

smartweed borer

European corn borer



Non-Cotton Agronomy

When Can I Stop Irrigating Grain Sorghum?

Grain sorghum acreage this year is considerably higher. There was a wide range of sorghum planting dates in 2013, including a modest amount of sorghum in some counties that was planted in June and even early July. 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 (gel like material can still be squeezed or forced out of the seed) 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.

If soil moisture is minimal to non-existent, then you will likely need to water perhaps two additional irrigations, possibly until you begin to see the first heads form hard dough. Likewise, if you have not been able to irrigate, then ANY irrigation you can supply is still favorable especially if you have gotten to heading. This means the crop is far enough along that you have some confidence that you can get some grain yield.

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. The presence of many tillers in the field that trail the main head by a week or more will extend the irrigation season by a similar amount.

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, and sorghum heads will be more red/orange on the south and west side of the head as it sits in the field vs. the north and east side of the head that may be more yellow in appearance.

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.

Alfalfa Resources for the Texas South Plains

Numerous alfalfa resources for agronomy, fertility, stand establishment, and weed control for the Texas High Plains are available on the web at http://lubbock.tamu.edu/othercrops. Producers in the Texas South Plains should target early and mid-September for seeding alfalfa into firm seedbeds and consider applying 2 years' worth of P fertilizer requirement prior to planting. Soil testing is highly recommended for alfalfa due to the nutrient removal, but there's little time for that at this point of the season. P_2O_5 removal from alfalfa fields is approximately 12-14 lbs. P_2O_5 equivalent per ton of hay. Over time this adds up to substantial P removal, and unless you have alfalfa on drip irrigation where you can put the P directly into the root zone in the acidified water (an excellent means to supply P), you get marginal benefit from surfaced applied, unincorporated P fertilizer over the course of a four or five year stand.

Alfalfa, Irrigation, and Field Size

The most recent alfalfa information for sprinkler irrigation in the Texas South Plains suggest that it requires approximately 6" of water per ton of production per acre. The amount of water is slightly less in the Texas Panhandle where evaporative demand is slightly lower. Few producers have this level of irrigation thus half circles and smaller acreages are required. Also, keep in mind that water district pumping limits in most of the South Plains and some of the Texas Panhandle restrict the level of irrigation that may be applied, and this allowed level of irrigation is declining. So be cautious about the size of acreage. Alfalfa responds linearly to applied irrigation for yield potential up to and past 12 tons per acre, so reducing acreage does not necessarily over concentrate applied irrigation.

Current Alfalfa Variety Traits

For a review of current disease and insect pest ratings of current commercial alfalfa varieties, consult "Winter Survival, Fall Dormancy, and Pest Resistance Ratings for Alfalfa Varieties" (2013 edition), a publication of the National Alfalfa & Forage Alliance, http://www.alfalfa.org (click on 'Education' then choose 'Alfalfa Variety Leaflet'). CT

Area Field Days and Meetings

Fall crop tours have begun and we have several on the calendar, as well as some scheduled harvest aid meetings. Also, industry field days may also be of interest. For specific

information, call Texas A&M AgriLife Extension agents or industry representatives for more details.

Industry
Sept. 13 – TTU/Texas A&M AgriLife Research Field Day, 8 a.m., Quaker Farm, 200 N. Quaker
Sept. 16 – Deltapine Consultants Field Day, 8 a.m.-noon, Chapman Farm, Lorenzo
Sept. 17 – Bayer CropScience Field Day, Levelland
Sept. 17 – Deltapine Grower Field Day, 10 a.m.-2 p.m., Nichols Farm, Seminole
Sept. 18 – All-Tex/Dyna-Gro Field Day, 9 a.m.-noon, 2200 West Avenue, Levelland
Sept. 19 – Deltapine Grower Field Day, 11:30 a.m.-3 p.m., Chapman Farm, Lorenzo
Sept. 24 – Americot Field Day, 10 a.m., Agrisearch, Inc. Farm,
Located about four miles west of Edmonson in northern Hale County
Sept. 24 – Bayer CropScience Field Day, Crosbyton
Sept. 24 – Bayer CropScience Field Day, Sudan
Sept. 24 – Deltapine Grower Field Day, 3 p.m., Doug Jost Barn, St. Lawrence
Sept. 25 – Deltapine Grower Field Day, 9 a.m.-1 p.m., Ricky Cude Barn, Lamesa
Sept. 26 – Bayer CropScience Field Day, Brownfield
Sept. 26 – Deltapine Grower Field Day, TBD, Sudan
Oct. 1 – Bayer CropScience Field Day, Woodrow **MSK**

Photo Credit: Patrick Porter

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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