Cotton Comments

OSU Southwest Oklahoma Research and Extension Center
Altus, OK

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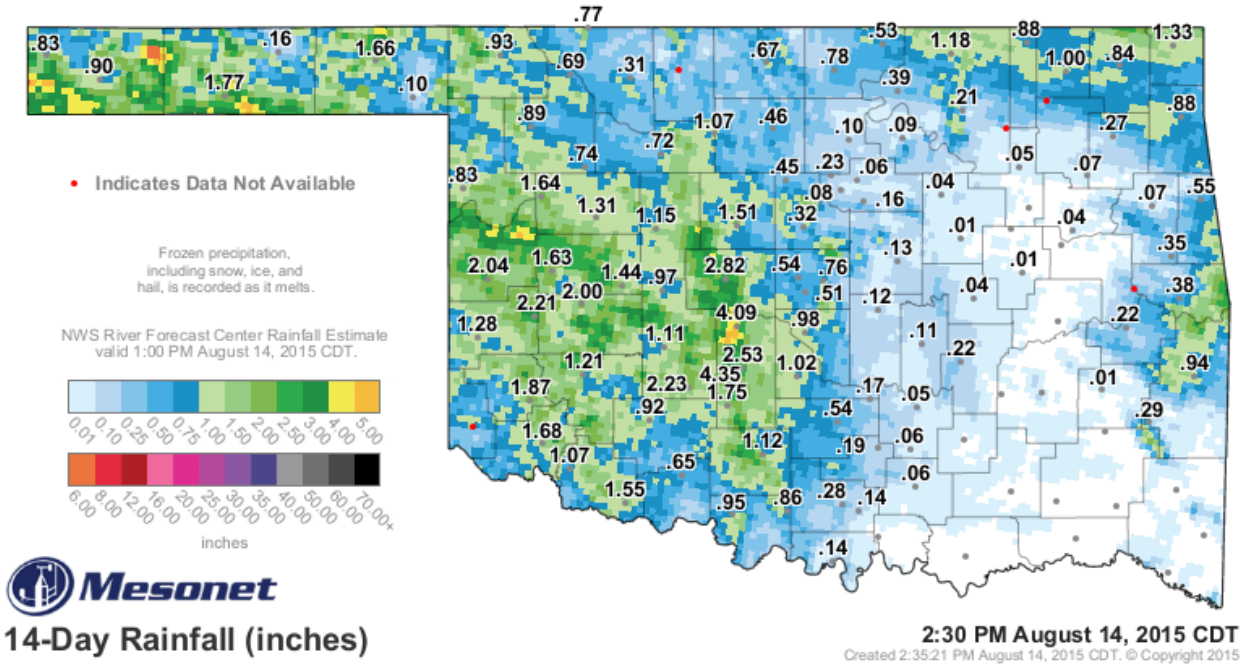
Crop Update

The August 12 USDA-NASS crop report indicated that upland cotton production is forecast at 12.65 million 480-pound bales, down about 20 percent from last year. Yield is expected to average 784 pounds per harvested acre, down 42 pounds from last year. Upland cotton planted area across the Belt is estimated at 8.90 million acres, down 1 percent or 100,000 acres from the June estimate. Oklahoma's 2015 acreage was estimated in June to be 250,000, which I felt was high. The August crop report stated our harvested acreage would be about 215,000 acres, which is still excessive. We believe that we have about 200,000 acres in 2015, and the abandonment should be fairly low. The report also noted that our 2015 yield was estimated at 781 lb/acre, up from 2014's 615 lb/acre. Production in 2014 totaled 269,000 bales, with 2015's estimate in the 350,000 range. It would be great to get there, but I suspect we will not make that mark.

The 2015 crop continues to make good progress. The irrigated crop is still a couple of weeks behind where we would normally be at this calendar date. The late May/early June planted fields have now been blooming for three weeks or so. Growing conditions were so good during the first half of June that many fields made it to first bloom in about 50 days, which is several days earlier than what would normally be expected from early to mid-May planted fields. Some were a few days earlier, some were a few days later. Irrigated cotton is making although early season retention is not necessarily what we would prefer in some fields. Dryland fields in some counties have received good rainfall and look very good to excellent. It has been a real blessing to see good rainfall in August, after its absence for the past several years. The August rainfall has certainly significantly improved yield prospects for considerable dryland acreage. We still have a long way to go to get across the finish line, but things are looking up compared to the past several years. Many of the earlier fields have reached peak bloom. Some growers are concerned about some irrigated fields nearing physiological cutout (nodes above white flower = 5). For more information, see Jerry Goodson's weekly scouting summary below. Sustained irrigation and rainfall will likely help keep these fields producing more mainstem nodes. The final bloom date is coming up soon, so basically all of the squares that we would take to harvest are now about 1/3 grown. The Mesonet rainfall graphic for the past 2 weeks is below.



Mesonet Irrigation Planner Water Use Results

I have received a few calls concerning crop water use. The table below presents accumulated heat units and cotton crop evapotranspiration (ET) for the Mesonet sites listed. These data are based on a June 1st planting date, since many fields were planted around that time in 2015. Triple digit temperatures and high winds have been encountered over the past few weeks, but recently temperatures have moderated. For June 1 planted cotton, crop water use has averaged about 0.21 to 0.27 inches/day in southwest Oklahoma. In the Altus vicinity, June 1 planted cotton averaged 0.25 inches/day. As the crop progresses further into the bloom stage, this daily water demand will increase.

For June 1 planting date through August 13					
Location (elevation)	DD60 accumulation from June 1	Past 3-day accumulated ET	Past 7-day accumulated ET	Past 14-day accumulated ET	From planting accumulated ET
	heat units	inches			
Altus (1365 ft)	1675	0.76	1.97	3.38	11.91
Tipton (1270 ft)	1690	0.81	2.28	3.93	12.57
Hollis (1631 ft)	1563	0.77	1.90	3.46	11.18
Erick (1978 ft)	1417	0.69	1.65	3.08	10.22
Ft. Cobb (1384 ft)	1564	0.63	1.80	3.29	11.07

Using COTMAN Concepts

We are nearing the breaking point for all counties in Oklahoma with respect to the latest possible cutout dates when considering the Bollman component of COTMAN. COTMAN is a cotton management program developed with Cotton Incorporated Core funding. This funding supported cooperative research conducted by several land-grant institutions across the Cotton Belt. This program assumes that 850 cotton heat units past blooming are necessary to produce a reasonably mature boll.

When using 60 degrees (F) as the developmental threshold, cotton heat units (also called DD60 heat units) are defined as:

(daily high temperature + daily low temperature) divided by 2 = average temperature

Then take the average temperature – 60 = daily cotton heat units

The accumulation of heat units from a certain date can provide useful information. The COTMAN latest possible cutout date is defined as the last date on which 850 heat units can be obtained before daily heat units diminish to zero because of cool temperatures. Long-term weather data are used to compute this and two probabilities or risk levels are provided. The first is the date at which in 85% of the years, in the long-term weather data set submitted, that 850 heat units past bloom could be obtained. The second is the date at which 850 heat units past bloom could be obtained in 50% of the years. The COTMAN team at the University of Arkansas computed the 50% probability date to be August 20th for the 1948-2007 time period. The 85% probability date for Altus was August 13th. Therefore, one can see that the window for setting bolls is closing in the area. It may be possible to retain a considerable amount of fruit after the COTMAN cutout dates, but the probability of obtaining high quality cotton diminishes for these bolls. Ultimately these bolls may open and produce lint, but it will likely be of marginal quality and may reduce the overall micronaire of the crop. Micronaire is essentially a confounded measure of both fiber fineness and maturity, and is the fiber property used by the USDA-Agricultural Marketing Service to estimate fiber maturity. Steep discounts may be encountered in the market if micronaire values are 3.4 or less.

The 2015 growing season has provided an abbreviated blooming period in many fields due to late planting. Although many fields bloomed faster than normal, we are still pushing a lot of our potential fruit load into the “risky period”. Once a cotton field blooms in the top (or the terminal) most of the yield potential is set. Even if fields continue to produce mainstem terminal blooms into early September, the likelihood of those late-set bolls producing a harvestable boll based on long-term weather data is low. What this means is that squares that are not at least close to 1/3 grown at this time have a low probability of making a fluffy, mature boll.

For a copy of the COTMAN Bollman cutout dates for various locations across the Cotton Belt (including Altus), click here.

Irrigation Termination Considerations

NAWF counts in some irrigated program survey fields have reached the COTMAN definition of cutout (NAWF = 5) triggering the heat unit countdown for irrigation termination. In contrast, hard cutout, as I define it, can be described as “cotton blooming in the terminal.” All fields that reached NAWF=5 and then “bloomed out the top” fairly quickly should be watched for potential irrigation termination within 450 heat units or so.” When using the COTMAN program various investigators across the Cotton Belt have noted that irrigation termination at about 350-450 DD60 heat units past cutout (here defined as NAWF = 5 on a steep decline toward hard cutout or blooming in the top) has been reasonable. However, 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 irrigation was terminated. A sub-surface drip irrigated (SDI) project conducted by Texas A&M AgriLife Extension Service personnel on 1,100 lbs per acre cotton in the St. Lawrence area indicated that untimely early termination based on heat units past cutout resulted in yield losses. However, based on their study it was concluded that few benefits were noted by extending SDI irrigation past 500 HU after NAWF = 5.

Using heat units after cutout is a good general guide, but growers should be looking at each field’s yield potential and soil profile moisture status. The value of continued center pivot irrigation and SDI after bolls begin to open is probably questionable, unless extremely high temperatures and high evapotranspiration are encountered and the field has a moisture depleted soil profile and a late boll load. Generally, we observe about 2 to 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. The last irrigation should provide just enough plant available moisture to retain and mature all the bolls that have a reasonable chance of producing lint of acceptable quality under normal growing conditions. Normally a boll will be retained once it reaches 10 to 14 days after bloom. The goal is to avoid excessive moisture stress at least until the final bloom to be taken to the gin becomes about a 10 to 14 day old boll. This will reduce the likelihood of small bolls shedding due to water stress. After that, late bolls can handle more stress.

Field Observations

Based on field observations, few irrigated fields reported have encountered NAWF=5 within the week or so. Assuming that NAWF continue to drop and the plants hit hard cutout, past NAWF=5 can be calculated, and various management options can be tracked and considered (see table below). When considering management options, the heat unit thresholds for various crop issues are listed.

DD60 Heat Unit Accumulation Past NAWF = 5
Date of NAWF=5 + 350 DD60s – safe from lygus bugs
Date of NAWF=5 + 450 DD60s – safe from stink bugs and bollworm egg lay if non-Bt variety
Date of NAWF=5 ~ 450 DD60s – terminate irrigation if soil profile is depleted
Date of NAWF=5 + 850 DD60s – possible harvest aid application considerations

RB

Insect Update

Insect pests are on the increase. A consultant reported stinkbugs in the Erick community (economic threshold is presence of stink bugs with 20% or more bolls with warts on inner carpal walls and/or stained lint). Another consultant reports spider mites have made an appearance in some Tillman county fields (treat when leaves start to look silvery on undersides and discoloration appears on upper surface and mites are present). Cotton aphids are being detected in more fields this week. The threshold for cotton aphids is treat when 50% of the plant terminals are infested and aphids exceed 50 per leaf (with low cotton price this number could be 80 per leaf). Grasshoppers are still present. Weekly scouting should continue for all pests as the crop is now into boll production stage. Moth counts continue to be below the long-term average.

Cotton Aphids

Photos courtesy of University of Arkansas

Cotton aphids are small, soft-bodied insects commonly referred to as “plant lice”. Aphids occasionally occur on cotton in such high numbers that control measures should be implemented. Build ups are localized and usually occur after the use of insecticides that are harsh on beneficial arthropods, including pyrethroid types. The insects are found on the underside of leaves and along the terminal stem, causing misshapen leaves with a downward curl and stunted plants. The insect damages cotton directly by sucking juices from the plant and indirectly by secreting honeydew. The honeydew is sticky and can lower the grade of lint. A sooty mold can develop on the aphid honeydew and discolor the lint. Sticky cotton may result in significant problems during the spinning process at mills.

Due to the high probability of beneficial arthropod control of cotton aphids, if this pest is found, any potential control measures should be carefully considered. If you have any questions concerning aphid populations, call this office.

Spider Mites

Spider mites can be distinguished from insects since they have eight legs rather than six.

Spider mites often attack cotton when insecticides have removed beneficial arthropod populations which normally keep this pest in check. Infestations are generally aided by hot, dry weather. In most cases, infestations will be localized in a field. Spider mites damage cotton by feeding on the plant juices and the foliage will turn a reddish or yellowish color under a heavy infestation. Mites are small in size and are generally found on the underside of the leaves. A close inspection is necessary to determine if mites are present. Before considering control measures please contact this office.

For a complete guide to spider mites, click here:

University of Arkansas Spider Mites on Cotton in the Midsouth

Beneficial Arthropods

Preservation of beneficial arthropods becomes crucial now to curb future potential outbreaks of cotton aphids and spider mites. Click on the following link to better understand the role of beneficials to control cotton aphids.

University of Arkansas Aphid Threshold and Putting Beneficial Insects to Work

Also take into account the presence of other beneficial insects. In a recent field survey Dr. Randy Boman counted nine lace wing eggs on one leaf in an area of aphid infestation.


Lady Beetle larva


Lacewing larva

Stink Bugs

Stink bugs in Oklahoma cotton were not a concern until the advent of Bt varieties. Transgenic Bt cotton resulted in fewer insecticide applications for control of lepidopterous pests and soon after, stink bugs were occasionally noted as damaging pests. Although not typically found in economically damaging populations in most southwestern Oklahoma fields, some areas do have issues.


Green Stink Bug

Conchuela Stink Bug


Brown Stink Bug

Photo courtesy http://stinkbugsguide.net/

The following information was taken from the Online Texas A&M AgriLife Extension Cotton Insect Management Guide, which is available here:

http://cottonbugs.tamu.edu/fruit-feeding-pests/stinkbugs/

This website also provides action thresholds and chemical control suggestions for this pest. Stink bugs are shield-shaped, flat and vary in size around 3/8 to 5/8-inch in length, and are about one-half as wide as their length. While the adult brown stink bug is light brown in color, the green and southern green stink bugs are bright green and similar in appearance. They can be distinguished from one another by color of the bands on their antennae. The southern green stink bug has red bands while the green

stink bug has black bands. The conchuela stink bug adult is dark brown to black with a red border and a red spot on the tip of the abdomen. The harlequin bug is primarily a pest of mustards and cole crops and will occasionally infest cotton. Adult stink bugs may live for several weeks. Stink bugs get their name from the foul smelling substance they exude from glands on their thorax. This chemical smell is meant to deter predators and warn other stink bugs of danger. This scent gland also plays a role in females attracting mates.

The reason stink bugs appear to concentrate in one part of the field and not others is due to the female's egg laying habits. A single female may lay 300 to 600 eggs, in clusters of 30 to 80 eggs. Egg clusters appear as rows of pale-green, pink or white barrels laid primarily on the underside of leaves. Eggs will typically hatch in 2 to 4 days under ideal conditions, but may require up 2 weeks when temperatures are cool.

Hatching southern green stink bugs
Photo courtesy Texas A&M AgriLife Extension

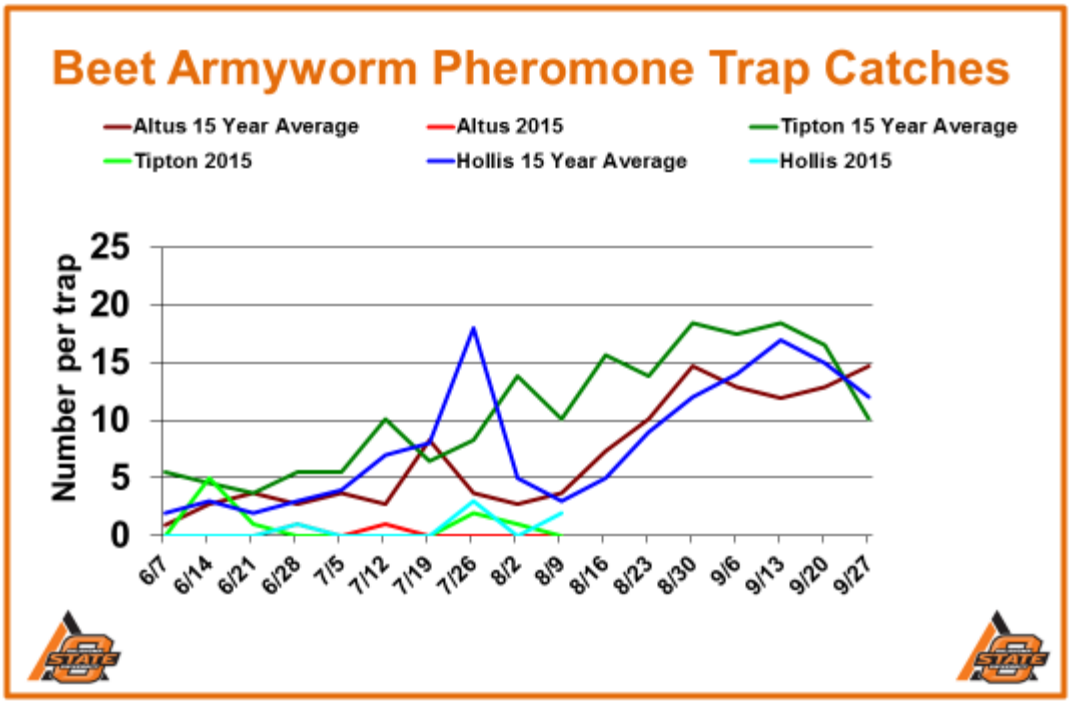
Stink bugs have piercing-sucking mouthparts and damage cotton by piercing bolls and feeding on the developing seeds. Their feeding activity usually causes small bolls to abort but can result in dark spots about 1/16-inch in diameter on the outside of larger bolls where feeding occurred. These dark spots do not correlate well with the wart formation on the inside of the boll to be used in scouting. There may be several spots on a boll without internal feeding. The external lesions are associated with wart-like growths on the inner carpal wall where penetration occurred. Seed feeding may result in reduced lint production and stained lint near the feeding site. Stink bugs are also known to facilitate the infection of boll rotting microorganisms. Because of their size, adults and fourth and fifth instar nymphs have the greatest potential for damaging bolls.

Oklahoma generally only has green and brown stink bugs that can cause economic damage in some areas. However all stink bugs are found in Oklahoma. Many products used to control stink bugs can be disruptive to beneficial arthropods, therefore, contact Extension personnel if a question arises.

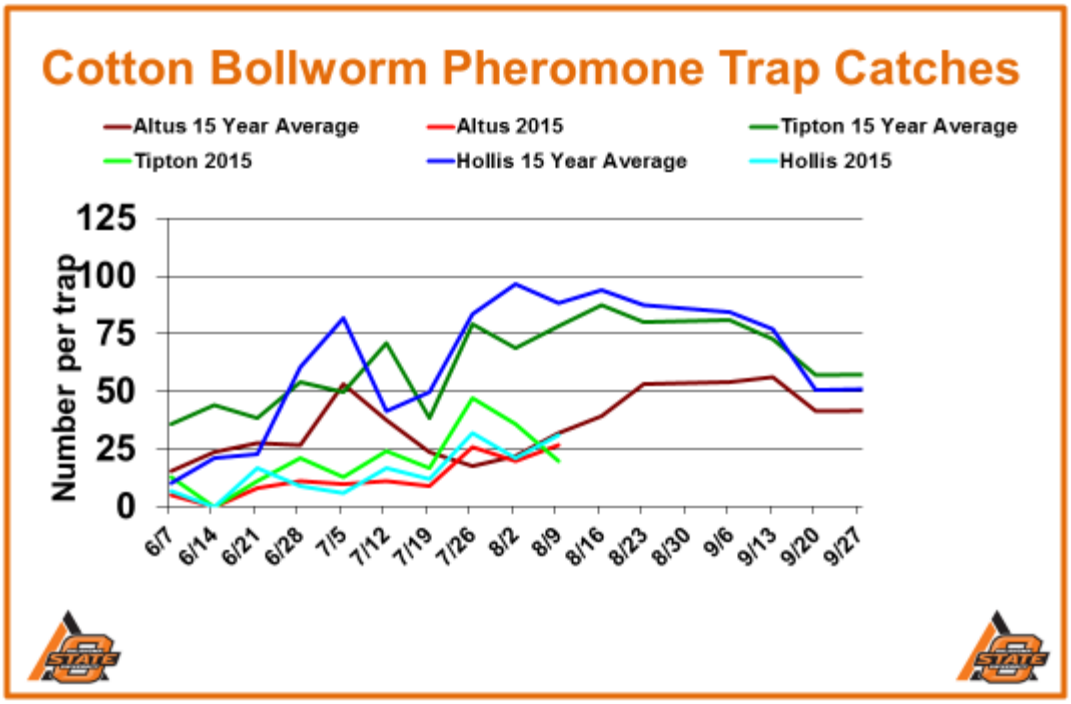
Field Surveys in Oklahoma – Week Ending August 14, 2015.

Location	Date of planting	First Bloom	Plant Stage	Insects	Comments
Beckham Irrigated RACE - Damron	June 3	July 26	5.75 NAWF	Grasshoppers	Excellent
Beckham Irrigated Innovation Demo - Damron	June 3	July 26	6.90 NAWF	Grasshoppers	Excellent
Blaine Irrigated XtendFlex Enhanced Variety - Schantz	June 1	July 24	6.00 NAWF	Grasshoppers 1 stink bug nymph	Good
Blaine Irrigated Cotton Inc Enhanced Variety - Schantz	June 2	July 23	5.25 NAWF	Grasshoppers	Good
Blaine Irrigated Bayer CAP - Schantz	June 1	July 24	5.00 NAWF	Grasshoppers	Good
Blaine Irrigated Dow Innovation Schantz	June1	July 24	5.75 NAWF	Grasshoppers	Good
Caddo Irrigated OVT – OSU Station	June 8	PHENOXY DRIFT ISSUES			
Harmon Irrigated Cotton Inc Enhanced Variety - Cox	May 27	July 20	5.00 NAWF	Grasshoppers	Good
Harmon Irrigated Bayer CAP - Horton	June 1	July 28	7.25 NAWF	Grasshoppers	Fair
Jackson Irrigated RACE - Darby	June 2	July 26	6.00 NAWF	Grasshoppers	Good
Jackson Irrigated OVT - Altus Station	June 4	July 27	5.90 NAWF	None detected	Good
Jackson Dryland Race - Abernathy	June 9	July 26	5.50 NAWF	Grasshoppers	Good
Jackson Irrigated Weed Control Trials - Altus Station	June 4	July 26	6.00 NAWF	Aphids	Good
Jackson WOSC	June 5	July 25	6.25 NAWF	None detected	Good
Tillman Irrigated RACE - Nichols	June 3	July 26	6.25 NAWF	Grasshoppers	Excellent
Tillman Dryland RACE - Fischer	June 10	July 28	6.00 NAWF	Grasshoppers	Cotton Root rot
Tillman Dryland OVT - (Tipton Station)	June10	August 2	5.25 NAWF	Grasshoppers	Good
Washita Dryland RACE - Davis	June 3	July 26	5.90 NAWF	Grasshoppers	Excellent

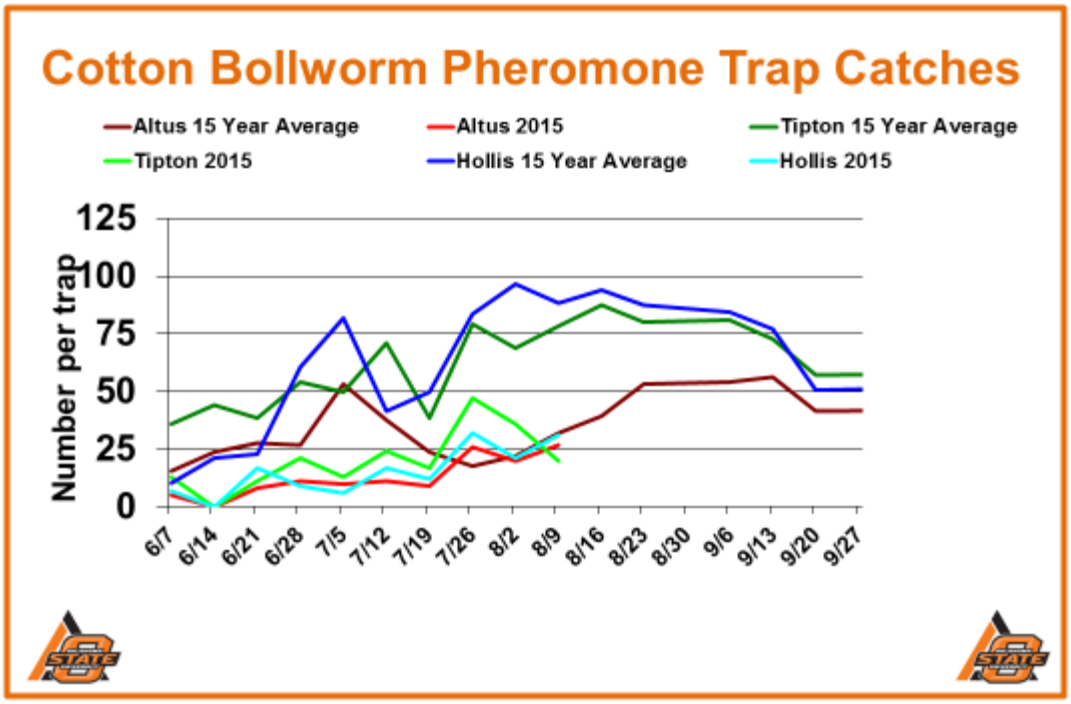
RACE – Replicated Agronomic Cotton Evaluation Trial (Oklahoma Cooperative Extension)
CAP – Cotton Agronomic Plot (Bayer CropScience)
OVT – Official Variety Trial (Oklahoma Agricultural Experiment Station, Altus, Tipton, Fort Cobb)



Beet armyworm moth



Cotton bollworm moth



Tobacco budworm moth

JG

Upcoming Meetings

August 18th - Oklahoma Irrigation Conference – Caddo-Kiowa Technology Center, Fort Cobb. The conference will provide 5 Certified Crop Adviser Continuing Education Units (4 in Soil and Water and 1 in Crop Production). See the attached brochure for more information. There is a $15 registration fee for the meeting. For those who might want to register online, it can be done here: http://oces.okstate.edu/caddo/oklahoma-irrigation-conference.

Dow/PhytoGen/Mycogen Diamond Showcase field days next week at the Texas Tech University Research Farm near New Deal, TX (see attached flyer for details).

Two choices: Thursday, Aug 20 at 2 pm or Friday, Aug 21 at 9 am

Registration is requested and can be done online at
http://www.diamondshowcasesouth.com/Growers

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