The University of Tennessee

UT Extension

West TN Research and Education Center
605 Airways Boulevard
Jackson, TN 38301

IPM NEWSLETTER

Update for Field Crops and Their Pests

No. 21 *August 15, 2008*

Past newsletters and other information can be found at UTcrops.com

Bookmarks: Cotton progress Soybean and corn update Insect control Farm management Moth traps

Announcement: Cotton Research Tour and Wheat Production Conference, September 3rd, West Tennessee Research and Education Center, 605 Airways Blvd. Registration begins at 8:30 am, and the cotton tour begins at 9:00 am. Link here for more information

Cotton Situation and Outlook (Chris Main, Extension Cotton and Small Grains Specialist)

The Tennessee Agricultural Statistics Service reports cotton condition as 4% excellent, 55% good, 32% fair, 8% poor, and 1% very poor. 96% of the crop is setting bolls compared to 83% last week, 95% last year and 95% for the five year average. The first cracked bolls appeared in my planting date trial at Jackson in early maturing cotton varieties planted on April 16 and 20.

The high temperatures (upper 90's and dry) experienced during the last week of July and first week of August are beginning to show up in the crop as small boll cavitation (small boll dies and is stuck to the plant). I bring up this topic since the planting date most effected at Jackson is the third week of May, when many acres across the state were planted. Cotton planted during this time was at full bloom when the high heat and dry conditions existed. Typically cavitation is a result of excellent early fruit retention and a period of stress (high temps and/or drought). The plant is not able to supply carbohydrates and water to all the fruiting structures and the squares shed and small bolls cavitate. Many theories exist as to why the small bolls do not shed from the plant. Typically it is thought that the boll and vascular tissue die and dry out before adequate levels of ethylene can form to cause separation at the abscission zone. While the loss of this fruit reduces yield it also usually means that you have good early season boll load already set on the plant.

DD60 Accumulation (TASS and NWS data)

Location	4/20-8/14	4/27-8/14	5/4-8/14	5/11-8/14	5/18-8/14	5/25-8/14	6/1-8/14
Dyersburg	1798	1753	1730	1693	1671	1594	1482
Fayetteville	1814	1757	1726	1672	1654	1574	1468
Jackson	1723	1675	1653	1610	1590	1521	1417
Memphis	2042	1973	1946	1888	1852	1755	1630

Soybean and Corn Update (Angela Thompson, Extension Corn and Soybean Specialist)

With early corn harvest just days away, reports of pollination problems continue to surface as producers check their fields. Areas that missed significant rain in June and suffered through the heat and drought in July can expect average corn yields at best this year. I have done some yield estimates (see formula below) in dryland fields and yields can fluctuate widely depending on the soil type. In some of the driest areas, corn is drying down prematurely and a timely harvest should be considered. Producers are encouraged to harvest fields early that sustained significant drought damage in order to minimize lodging from weakened stalks.

The soybean crop actually looks pretty good, particularly where later planted beans caught some July rains. It is difficult to gauge yield potential at this time, but pod fill certainly looks better than it did this time last year. Varieties planted late that responded well to a fungicide treatment in Dr. Newman's plots could be sprayed with a fungicide where yield potential looks good. Disease pressure has been variable in many areas this year due to dry weather earlier, but diseases setting in early in the growth period of these extremely late planted fields may have more impact on yield. As always, evaluate the yield potential and the disease pressure before making a decision to spray.

Estimating Corn Yields. Estimating yields when corn is standing in the field is not an exact science. The results are only as good as the number of representative samples that you take and in an extremely variable field this technique isn't real accurate. If you find that your estimates vary widely between sampling locations, this won't work well for your field. There are a number of formulas out there, but most use the same basic information. The seed weight value tries to account for stress level in the crop and its potential impact on grain weight.

Yield (bu/A)= (Total ears in 1/1000th of an acre) X (Avg. number of kernel rows/ear) X (Avg. number of kernels/row) X (Seed Weight Value).

Tips: Make at least four estimates per field. When counting total ears, count only harvestable ears that you are sure the combine can retrieve in 1/1000th of an acre, avoiding lodged ears. Don't include nubbin ears when counting kernel rows and kernel numbers unless they truly represent what is in the field. Don't count extreme tip end kernels. Count kernels up to the last complete ring of kernels around the cob. If kernel numbers per row are uneven, estimate an average value for that ear.

Length of row which represents 1/1000th of an acre:
20 inch rows: 26'2"
30 inch rows: 17'5"
36 inch rows: 14'6"
38 inch rows: 13'9"
(For other row spacings, divide 522.72 by distance in inches between rows)

Seed Weight Values:
0.013= Good irrigated corn exposed to little stress
0.01116= Average stress value in an average rainfall situation
0.009= Dryland corn subjected to greater stress

Impact of a Ground Sprayer on Soybean Yield. Running a ground sprayer through a field of waist high soybeans can cause some mechanical damage to the plants but the impact on yield has generally been considered to be minimal. Scott and I have had a number of calls where consultants or producers are uncertain about running over beans late in the season because of plant damage concerns. The table below is based on some data generated by Virginia Tech looking at effect of row width and boom width on yield loss in full season and double crop soybeans sprayed with a fungicide. There was slightly more damage on mid row width beans and as boom width increased (fewer trips to cover a field) yield loss was less. But generally, yield loss was 1.5 bushels per acre or less regardless of row spacing or boom width. Bottom line: the yield benefit from a ground application in fields that have strong insect pressure or to varieties that consistently respond by several bushels to a fungicide application would outweigh any mechanical wheel track damage in the bean crop.

Row Width (inches)	Yield Loss (Bu/A) based on 50 Bu/A Yield Potential Field			
Full Season	**45 ft boom**	**60 ft boom**	**75 ft boom**	**90 ft boom**
7.5	0.7	0.5	0.4	0.4
15	1.1	0.9	0.7	0.6
36	0.3	0.3	0.2	0.2
Double Crop				
7.5	1.4	1.1	0.9	0.7
15	1.4	1.1	0.9	0.7
36	0.2	0.2	0.1	0.1

Insect Management (Scott Stewart, Extension IPM Specialist).

Cotton. The early planted crop is being "turned loose" as it passes NAWF5 + 350-400 DD60s, but the majority of the crop will need to be watched closely for another 7-10 days (or longer on the latest planted fields). Stink bugs continue to be the primary problem in the later cotton, with the green stink bug being the most common species. I've seen several fields at 2-3 times threshold levels with substantial boll damage. If you are running close to threshold, be sure to do some boll damage ratings as described in previous newsletters. You will sometimes trigger a stink bug application based on the boll injury threshold (20%$^{+}$ injury to thumb sized bolls) even when drop cloths indicate populations are below treatment levels. Boll damage is a better sampling method when stink bugs are the primary pest present. Bolls are not safe from stink bugs until about 25 days after flower (about NAWF5 + 450 DD60s). However, I believe we can still use our insecticide termination rule of NAWF5 + 350-400 DD60s providing a field is relatively clean of pests at this time.

Bollworms are being sprayed in a few fields of Bollgard cotton, particularly the greener fields. You should consider increasing the treatment threshold from 4 larvae/100 plants to 6-8 larvae/100 plants as fields close in on NAWF5 + 350-400 DD60s. There is enough bollworm pressure in most of the state that any required stink bug/plant bug application should probably include a pyrethroid insecticide as part of the mix, particularly on non-Bt or Bollgard cotton. Be sure to check under stuck bloom tags and in pink blooms for bollworm larvae (pictured right).

Fall armyworm is being reported in a few fields. Pay special attention to bolls in the middle of the plant, and also look in white and pink blooms. On bolls, look for window pane feeding on bracts (and larvae feeding behind these bracts and on the boll wall). Bollgard and non-Bt cotton are at greater risk than Bollgard II or WideStrike. Pyrethroid insecticides do a reasonable job of controlling fall armyworms if the larvae are small. Diamond (6-9 oz/acre) or a pyrethroid + Diamond (4 oz) acre are the going treatments when larvae are bigger. Application is recommended when 4% of bolls and/or flowers are infested or when 10-20 larvae are found per 100 plants. I am not aware of any fields currently being treated for this pest.

Boll weevil eradication has made great progress this year. I want to thank Randall Crow (OIC, West TN Eradication Work Unit) for keeping me informed of the progress. To date, only 10 boll weevils have been caught in pheromone traps during 2008. All of these weevils were in five field units (3306, 3307, 3308, 3309, 3310). This represents well over a 99% reduction compared with the number of weevils trapped by this time last year.

Soybeans. Stink bugs are currently a bigger issue in cotton than in soybeans, but this will change once the cotton begins to mature and beans are about the only crop left. Remember that the stink bug threshold increases to 36/100 sweeps after R5.5 (mid podfill). I've previously suggested that 30-32 stink bugs per 100 sweeps is a reasonable threshold considering the better commodity prices. For those of you that think this is still too high, show me the data!

Corn earworms (bollworms) have been reported in some fields. As mentioned in last week's newsletter, 10 or more larvae per 25 sweeps is enough to justify treatment after fields begin to flower, and pay special attention to fields with relatively open canopies. Most the corn earworm action appears to be in the northern half of West Tennessee (as indicated by moth traps and phones calls). If you are finding corn earworm larvae in a soybean field, but not enough to treat, you might want to come back in 4-5 days because populations can build quickly.

Spider mites have also been reported in a few fields. There are not any good thresholds for this pest in soybeans, but I would consider treatment anytime mites are causing premature defoliation. Spider mites are not a common problem in soybeans, but we can sometimes flare infestations making insecticide applications for other pests. So, avoid unnecessary insecticide applications. Brigade (5 oz/acre) is about the only choice for control of mites in soybeans, and this product will control stink bugs and most other pests that may be present (soybean loopers is the primary exception). Dimethoate at 8-12 oz/a may provide some relief. Neither product will totally clean up spider mite populations. As far as I know, Brigade is the only bifenthrin product currently labeled for soybeans. It is your responsibility to check the label before making an application. Hero, a premix of Brigade and Mustang Max, is mostly bifenthrin and is also labeled soybean.

Green cloverworm (pictured below) is the most common defoliating caterpillar being found, but soybean loopers are starting to show up in low numbers. I have not heard of a field even close to

a treatment levels for these pests. UT's recommended treatment threshold for defoliating pests is when 20% or more defoliation occurs during pod fill (R1-R7). This threshold is a good one --- yield loss is unlikely unless defoliation exceeds this amount. However, you don't necessarily have to wait for 20% defoliation to make a treatment decision. Mississippi State University uses a couple of treatment thresholds based on larval counts that work well. These thresholds are 38 green cloverworm per 25 sweeps or 19 loopers per 25 sweeps. Left untreated, populations of this size will usually cause greater than 20% defoliation. Treating specifically for green cloverworms is unusual, and they are easy to kill with insecticides. Serious infestations of soybean looper are not uncommon in later maturing fields. Looper infestations, when they occur, often begin to show up at the end of the month. Soybean loopers are another problem we can sometimes create with previous insecticide applications that reduce beneficial insect populations. Pyrethroid insecticides are not very effective on soybean looper.

There are several insecticides listed in UT's insect control recommendations for soybean for the control of loopers (pictured right). These include Steward, Tracer and Larvin. Intrepid was somehow omitted from the guide this year but is an excellent choice for control of loopers. Intrepid is labeled for use at 4-8 oz/a, but 4 oz is usually plenty, and I have had generally good success in tests with rates as low as 3 oz. The above looper insecticides have poor or no activity on stink bugs or other non-caterpillar pests. Acephate (1 lb/a) or Lannate LV (24 oz/a) are sometimes used for a combination of loopers and stink bugs, but Acephate will sometimes miss a few loopers and Lannate will sometimes leave a few stink bugs. Perhaps a better option for a combination of stink bugs and loopers is Intrepid (3 oz/a) plus a pyrethroid insecticide or methyl parathion (16 oz/a).

When do I quit worrying about insect damage to my soybeans? The most sensitive time for insect injury is between R3 and R6, when seed are filling. Seed size is mostly determined at R6 (full seed). It is hard to justify insecticide applications once fields hit R7 (beginning maturity) because full yield potential is already determined by this stage. This would include applications for defoliating pests such as mites or loopers. After all, the plant begins dropping leaves on its own at this time. Because most seed are nearly full size at R6, stink bugs are less likely to reduce weight (yield) after this point. This is the main reason the stink bug threshold increases dramatically at R5.5 (mid podfill). However, stink bugs can also affect seed quality which may cause discounts until maturity. The primary damage that threecornered alfalfa hoppers cause once plants are flowering is defoliation (by girdling leaf petioles) and reduced seed size (by girdling pod stems). So again, sometime shortly after reaching R6 and before R7 is the logical point to quit worrying about this pest.

Sorghum. I have had several calls about late sorghum. Late sorghum will often require treatment for one or more insect pests including fall armyworm, corn earworm, sorghum midge,

sorghum webworm and even southwestern corn borer. UT's insecticide recommendations for sorghum can be found at http://www.utextension.utk.edu/fieldCrops/cotton/cotton_insects/pubs/PB1768-Sorghum.pdf. Currently, the calls are concerning fall armyworm in the whorls. The defoliation these larvae will cause in the late whorl stage is not a big threat to yield. However, once these late fields begin putting heads out, fall armyworm, corn ears and sorghum webworm infestations are all potential problems. Treatment is strongly recommended anytime 4 sorghum webworms, 2 fall armyworms, or 2 corn earworms are found per head. Or, use a threshold of 1 fall armyworm or corn earworm per head if most the larvae are already bigger than ½ inch long. Sorghum midge is also a common problem of late sorghum, especially if earlier maturing fields are nearby. Treatment is needed if one or more midges (pictured right) are found per head. Do not be surprised if late sorghum requires more than one insecticide application. Synthetic pyrethroids, Lannate or Lorsban are often used for control of the pest complex above.

Area Report for Northwest Tennessee (Gene Miles, Area Crop Specialist)

Cotton: Rainfall in the area this past week ranged from 0.5 to 3.6 inches. Open cotton bolls have been noted in droughty areas of fields this week. Larger more mature plants monitored this week average 45 inches in height, have 19 nodes with 15 visible 1st position fruiting positions and are averaging 78 percent 1st position fruit retention. As cotton producers continue to make management decisions, they need to remember that U.T. research has pointed out that a bloom on August 10 only has 50 percent chance of producing cotton because of available heat units. Plant bug numbers for the week from the Dyer and Lauderdale county IPM programs and private consultants range up to 2.4 per 6 row feet and/or 30/100 sweeps. Producers that treated high numbers of plant bugs (5.0/6 row feet), stink bugs (3.2/6 row feet) and spider mites with bifenthrin (Brigade 2, Discipline 2, Fanfare 2) are reporting good results. One private consultant has reported some difficulty in controlling plant bugs with pyrethroids. Stink bug numbers this week range up to 0.6/6 row feet. Private consultants, producers monitoring their own cotton and IPM scouts are reporting bollworm/budworm damage ranging up to 12% eggs, 2% fruit damage (conventional cotton) and 1% fruit damage (Bt cotton). The high beneficial count for the week is 11.2 per 6 row feet.

Soybean: Stink bugs in soybeans being reported from Dyer County IPM scouts and producers range up to 0.6 per 3 row feet and/or 2 per 25 sweeps in Group IV soybeans in the bloom to mid-podfill stage of growth. Also, Dyer County IPM soybean scouts are reporting fall armyworm numbers at 0.2 per 3 row feet (threshold is 12 per 3 row feet).

Farm Management Update (Chuck Danehower, Area Specialist - Farm Management).

To combat rising input costs, farmers must begin earlier and earlier their farm's financial and crop plan. For producers who are considering planting wheat, the 2009 crop plan has started. Available information seems to indicate that input costs for all crops in 2009 will increase on the average around 20% from 2008. This is on top of a 50% increase in 2008 from 2007. Fertilizer

costs are difficult to get a handle on at this time, although the consensus among suppliers is that it will be higher. I am still a believer in a diversification of crops and crop rotation as we just don't know what crop will yield the best. It does not take much of a yield increase at today's prices for one crop to overshadow the other. However, farmers with irrigated land and with hopefully a more stable production would have the capability to focus on profitable crop selection more so than dry land.

Using projected input prices, I have modified the University of Tennessee's Wheat budget and am summarizing it as follows:

Variable Expenses	Cost per Acre
Seed & Treatment	$ 54.00
Fertilizer(includes lime)	$ 161.00
Chemicals	$ 24.00
Fuel & Repairs	$ 55.00
Operating Interest	$ 12.00
Total Variable Expenses	$ 306.00

When making cropping decisions where the equipment complement is set and not likely to change, the projected returns above variable expenses is a useful tool. If equipment is changing, then a whole farm plan or at least a budget including fixed costs would be needed.

The wheat market could conceivability offer cash prices anywhere from $4.50 bushel to $7.00 bushel for 2009 wheat. There are I am sure, some probabilities of higher and lower than this range. As we know, prices can be volatile and change quickly. The next table examines the returns above variable expenses at varying yield and market prices.

Returns Above Variable Expenses Per Acre

Yield/Acre	$4.50 bu.	$5.00 bu.	$5.50 bu.	$6.00 bu.	$6.50 bu.	$7.00 bu.
40	-$126	-$106	-$86	-$66	-$26	-$26
50	-$81	-$56	-$31	-$6	$19	$44
60	-$36	-$6	$24	$54	$84	$114
70	$9	$44	$79	$114	$149	$184

Tennessee yields in 2008 are currently projected statewide to be 65 bushels per acre. This would make the five year average to be 55 bushels per acre. It appears that the higher yield and higher price levels are needed to make wheat a profitable crop. This is particularly true on a share rent farm where it looks like 70 + bushels per acre at $6.50 + will be needed to make wheat feasible. Returns from wheat are typically better on own or cash rent ground. Develop your own table using your input costs, yields, price, and rent assumptions. Wheat has been and can be a profitable crop and works well in a crop rotation. Discuss with your supplier, fertilizer and other input costs. With careful planning, more favorable input prices may be secured. Every farm situation is different so plan ahead to make informed decisions in your operation. If you would like assistance in developing a farm plan or budget, contact your local County Extension office.

Tennessee Pheromone Moth Trapping Summary - Trapping efforts are funded in large part by the Tennessee Cotton Incorporated State Support Program. Some County Extension Agents are also reporting additional trap counts for SWCB moths at corn variety test locations. Thanks to them and Bob Williams for these data.

Numbers of Moths per Week (Week 15, Ending 8/12/08)

Trap Location	Tobacco Budworm	Corn Earworm (Bollworm)	Beet Armyworm	Trap Location	Southwestern Corn Borer
Hardeman (Bolivar)	1	0	0	Fayette (Whiteville)	0
Fayette (Whiteville)	4	0	---	Tipton (Covington)	1
Fayette (Somerville)	0	0	0	Madison (Exp. Stn.)	59
Shelby (Millington)	2	2	0	Gibson (Exp. Stn.)	8
Tipton (Covington)	20	54	---	Dyer (Newbern)	22
Tipton (North)	32	1	12	Weakley (South)	423
Haywood (West)	15	2	1	Weakley (North)	107
Haywood (Brownsville)	1	2	0		
Madison (North)	2	0	---		
Madison (Exp. Stn.)	4	168	17		
Crockett (Alamo)	0	6	0		
Crockett (Maury City)	7	57	4		
Dyer (Bogota)	0	0	0		
Dyer (Newbern)	4	8	---		
Lake (Ridgley)	10	179	49		
Gibson (Kenton)	2	104	0		
Gibson (Exp. Stn.)	4	16	1		
Carroll (West)	4	23	2		
Lauderdale (Goldust)	8	49	58		
Total	**120**	**671**			

An asterisk (*) indicates trap was missing or knocked down.

Scott D. Stewart (editor)
Extension IPM Specialist