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FOCUS on Entomology

For South Plains Agriculture

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IN THIS ISSUE

COTTON INSECTS

Much of the cotton around the Lubbock area is at physiological cutout or rapidly approaching cutout. That sea of white blooms at the top of the field is a sure sign that cutout is at hand. With cutout and limited moisture comes massive fruit shedding, as plants unload squares and small bolls in an effort to bring balance back between resources and energy drain. This shedding is not insect related although damaged squares certainly will be shed too. Also, worm-infested fruit is often shed and worms in this ground-hugging fruit will remain undetected for a few days under cool conditions or under full canopy closure. They then can move back onto plants and surprise you when they reappear in scouting reports.

Once cutout occurs you can begin calculating and accumulating heat units from daily max/min temperatures to determine when fruit is safe from caterpillar and Lygus bug pests. Somewhere between 350 and 450 heat units past cutout will insure that all bolls you can realistically count on will be relatively safe. If you have fields that are still actively growing, you might run out of time before physiological cutout occurs. If so, you will need to base heat unit accumulations on seasonal cutout dates for your area.

COTMAN suggests that these dates for a 50% probability level are July 24 for Dimmitt, August 8 for Plainview, August 8 for Lubbock and August 12 for Lamesa. Elevation differences between these locations are the primary causes for these differences. My 27 years of experience in this area would indicate that the above dates are too conservative. My personal use dates are August 5, 10, 15 and 20 for the sites listed above.

Beet armyworms (BAW) have developed to problem levels in some fields, especially just east and southeast of the city of Lubbock. This caused officials with the Texas Boll Weevil Eradication Foundation to alter treatment criteria for spraying this past Wednesday. (See more information on this under the boll weevil section.) Infestations have increased to 12,000 – 47,000 larvae per acre in the heavier infested fields. However, most fields across the area

remain with few if any beet armyworms. At the time I was preparing this article we were still trying to determine the extent of the problem. We are finding many egg masses as well as larvae so the problem is not going to end overnight.

Where these BAW came from is a mystery to me. Trap catches of moths have ranged from an average of 7 to 34 in the two new zones this past week, while for the same time period last year they ranged from 120-239. Trap catches in the rest of the state have also been low. So again I ask, where did these come from??

Remember that BAW often are clumped in distribution, giving the illusion of a worse problem than there actually is based on whole field evaluations. Even so, it is clear we need to increase our vigilance for this pest.

Also remember that BAW tend to eat more leaves, flower petals, bracts, etc. than bollworms; reducing their comparative damage potential. That is why we tend to use a higher threshold for BAW than for bollworms. Basically under most conditions we use a two-for-one relationship when deciding when to treat. Since small BAW larvae are easier to find than small bollworm larvae, all producers and consultants should use 10,000 larvae per acre as a starting point, when fruit damage is equal to that of bollworms. They should increase this toward 20,000 larvae per acre when BAW are feeding a lot on plant structures other than squares and bolls. BAW tend to be messy feeders and hence their damage often produces a "knee jerk" reaction rather than a calm, objective management decision.

BAW damaging square

However, this latest infestation is a little different than we are used to seeing. What happens is the BAW moth lays her eggs in a mass. Many of these masses are on the upper levels of the cotton canopy. These eggs hatch and the small larvae feed in a small area causing extensive leaf damage. We call this area (less than a foot in diameter) a "hit". But now their feeding behavior becomes interesting. What we are finding is that these small worms are dispersing down the row attacking squares much the way bollworms do. If you stand over the row you will see little or no evidence of their presence. You must scout individual plants much like you do for bollworms. Eventually these squares will flare and become quite noticeable. Please don't wait this long to discover the problem. Early in my career I got caught by such an infestation in Gaines County and the damage was incredibly high. For seven more beet armyworm pictures go here.

BAW "Hit"

Since BAW infestations are rarely uniformly distributed between plants or across the field (unless you have a very high number per acre) then sampling should certainly involve a lot of plants spread across the field, making sure to include many plants from the field center. Once you decide you have enough worms to treat, make sure that they weren't on only one or two plants checked. We do this by requiring that at least 10% of the plants checked are BAW infested.

There are several worthy insecticides for BAW control including Denim, Steward, Tracer,

Confirm, Intrepid, Lorsban, Larvin and Lannate. The latter three older materials can be quite effective but usually are not up to the standards of the newer materials. I really like Intrepid for its long residual activity and low impact on beneficial insects and spiders. Denim is available on a section 18 and is quite good. Steward is also effective but is not so kind to ladybeetles. Tracer works too but coverage becomes a big issue. None of these insecticides will control heavy bollworm infestations of mixed aged larvae. A pyrethroid would be necessary in addition to the beet armyworm material if both species were present at economically damaging levels.

2002 bollworm control test near Liberty Gin, Lubbock Co. TX.

Insecticide [1]	Formulated rate/acre	Total larvae per 100 plants (pre-treatment)	Total larvae per 100 plants (1 week later)	Corrected percent control[3]
Untreated	----------	70 a[2]	70 a	--------
Larvin	1 ¾ pts.	73 a	7 d	90.4
Steward	11.3	63 a	17 cd	73.0
Steward + oil	10.6 +16 oz.	60 a	3 d	95.0
Curacron	12.8 oz.	80 a	53 ab	33.7
Tracer	2.84 oz.	63 a	47 ab	25.4
Denim	8.0 oz.	70 a	37 bc	47.1
Karate Z	1.75 oz.	60 a	13 cd	78.3
Decis	2.55 oz.	30 a	7 d	76.7

[1]Selected test treatments.
[2]Numbers in column followed by the same letter are not different (P=0.1, LSD).
[3]Percent control adjusted using Henderson's formula.

Problem bollworm infestations are all but over. Most of what is left is what we refer to as "pigs". These are the fat hogs that burrow into bolls, laze around in white blooms or are squeezed tight between the square proper and its bracts. What would a 1½-inch bollworm be doing in a square? As you know, most bollworms move down the plant, damaging larger and larger squares, then blooms, then bolls as they age and increase in size. But what happens when they run out of fruit after moving down the plant? They could move to an adjacent plant. But what if its fruit is already gone or another bollworm is already standing guard over this food stash? Then they must move back up the plant to feed on squares produced during their earlier journey down the plant.

Brant Baugh (IPM Agent in Lubbock County) and I had a bollworm control test out during this last activity cycle. The results were surprising for some of the treatments. The pyrethroids worked reasonably well but not as well as we expected. The caterpillar infestation was distributed on fruit in such a way that many were not in exposed positions. Many were in blooms or behind bloom tags. The good news was that there was very little recruitment from a further egg lay. Remember this is a test with 10 gallons total spray volume and three nozzles per row with the outside nozzles on drops. So coverage was not an issue.

Based on moth trap catches and age distribution of larvae observed in cotton, corn and sorghum fields, I would expect peak egg deposition to be around the middle of August. The egg lay could start as much as 10 days or so earlier and extend into the latter part of August based on how long the last cycle of egg laying took. This next infestation has the potential to be much larger than July's but the crop should be further along toward maturity and therefore less vulnerable.

Aphid numbers have continued to increase with some fields requiring treatment. The recent run of pyrethroids for bollworm control and the multiple applications of ULV malathion on selected fields for boll weevil eradication probably have played some part in this increase. But, in general, aphids are increasing across most fields. Many of these infestations have yet to move out of squares or

terminals and down plants to the undersides of expanded leaves. Still other infestations are being dealt with by an abundance of ladybeetles.

Once aphid levels pass through the 50 per leaf threshold level, it is usually time to treat. Don't base decisions solely on terminal infestations. Also add in numbers from middle mainstem leaves when making control decisions. We have many options this year for aphid control including Bidrin (use only the 8 oz/acre rate), Furadan (available on a section 18), Centric, Intruder, Provado, Trimax, and sometimes Lorsban or Lannate. My favorites remain (in no particular order) Furadan, Bidrin Centric and Intruder. A cost-effective rate of Intruder (0.6 oz/acre) has looked good in several Texas tests and through a producer's ground rig recently at Lockney.

Syngenta has been looking at reduced rates of Centric with some success. Both New Mexico and Oklahoma currently have a 24C for this reduced Centric rate. Our Texas Department of Agriculture needed more Texas data before they were willing to grant a lower rate 24C. This would make this product more price-competitive. Currently Centric is mainly available as a 25WG material with a rate recommendation of 3 oz/acre. Also to be available will be the 40WG formulation at a 2 oz/acre rate. Comparative reduced rates would be 2 oz for the 25WG and 1¼ oz for the 40 WG.

My counterpart at Corpus Christi, Dr. Roy Parker, conducted an insecticide screening trial earlier this year for aphid control. Some of the results are listed in the following table:

Average number of aphids per tagged leaf in cotton, TAES, Nueces Co. TX. 20002

Insecticide	Oz rate/acre	Pre-treat	6 days post	15 days post
Trimax 4F	1.00	204 a [1]	1.8 b	60.3 b
Furadan 4F	8.00	164 a	1.5 b	65.4 b
Intruder 70WP	0.60	210 a	0.0 b	1.3 c
Centric 40WG	1.25	167 a	1.6 b	42.2 b
Centric 40WG	2.00	189 a	0.1 b	32.6 bc
Untreated	------	228 a	252 a	121.9 a

[1] Numbers in column followed by the same letter are not different (P = 0.05, LSD).

The best products at 2 weeks were Intruder at 0.6 oz/A and Centric 40WG at 2 oz/A. All legitimate entries worked at one week. We have not had as good a results with Provado (same active ingredient as Trimax) in our tests up to this point. We will be putting out our own insecticide test shortly and will provide our results ASAP.

Lygus bug numbers remain below treatment levels in most instances. There have been some reports of threshold numbers in scattered fields to the north of Lubbock but we have yet to find much in our 9 pest management programs. So far this has not been much of a plant bug year. Research projects have been compromised and there is a danger that we will again fail to find fields suitable for our insecticide screening trials. We have planned two tests with about 30 treatments between them. We need at least an average of 4 Lygus per 3 foot of row to initiate the tests. Any lower number could compromise the results.

A number of folks have indicated in previous conversations and meetings that they thought our area had an increasing plant bug problem. The data does not support this. Except for 1999 when Lygus were especially bad up north, we have not noted a trend toward increasing problems. What we have noticed is an increased awareness and uneasiness about Lygus since the 1999 season. There are fields each year that have problem infestations but these are generally scattered across the area.

The vast majority of fields fail to develop problems with this pest. What we really have reflected here is the uncertainty many people have in dealing with plant bugs---in sampling, economic thresholds and insecticide selection.

The boll weevil eradication program remains on track. With increased beet armyworm activity in (and around ?) Lubbock County the Texas Boll Weevil Eradication Foundation altered their trap trigger beginning Wednesday, July 31 for the entire Southern High Plains Zone. The trap trigger remains one weevil trapped per field but the Foundation no longer sprays the entire field that the trap catch occurred on and the entire adjacent field. They now will spray only 40 acres in each field. This would reduce the acres sprayed each week by about 50-75%. Once the distribution of BAW is determined, the Foundation most likely will only maintain the altered trigger in the affected work units. They are just being proactive right now. The number of work units in this zone in which 5% or more of the acreage was sprayed last week was seven. The number of work units with more than 15% sprayed was only three. It is still very important that we maintain the pressure on the weevil in our area so that they don't have a chance to rebound and the Foundation doesn't lose all the progress they have achieved.

Average number of boll weevils per trap per week accumulated over 15 weeks. (Week ending July 28,2002)

Zone	2002	2001	2000
NWP	0.00013	0.011	0.132
WHP	0.00028	0.017	0.491
PB	0.00008	0.017	N/A
NHP	0.004	--------	--------
SHP	0.002	--------	--------

Acres sprayed this past program week (ending July 28) and accumulative acres sprayed to this date.

Zone	Week ending 7/21	Accumulative	Acres in zone
NWP	1,609	5,577	483,900
WHP	4,194	17,206	748,874
PB	1,913	7,130	500, 048
NHP	9,163	101,587	551,277
SHP	22,203	259,867	1,096,295

Acres sprayed this last week were up quite a bit in the Northwest Plains Zone but down some in the Permian Basin Zone and cut in half in both the Northern and Southern High Plains zones. **JFL**

CORN AND SORGHUM INSECTS

Fall armyworms (FAW) are very abundant in corn and sorghum. I have seen everything from 2nd instar larvae to pupae, so damage will continue. There is no recognized economic threshold in corn, but heavy infestations may cause substantial yield losses. The larvae feed on ears, ear shanks, and behind leaf collars. They then feed directly on the ear.

FAW whorl feeding is ugly, but will not generally cause economic damage to sorghum. However, large FAW larvae are eating machines, and they especially like the buffet offered by compact sorghum heads as they emerge. FAW is one of the two species that comprise the sorghum headworm complex. The July 26 issue of FOCUS discussed headworms and presented the action thresholds. The attached photos of fall armyworm and corn earworm may help in separating the two species.

Southwestern corn borer moths are still flying. European corn borer is almost non-existent this year. Greenbugs are continuing to build in some sorghum.

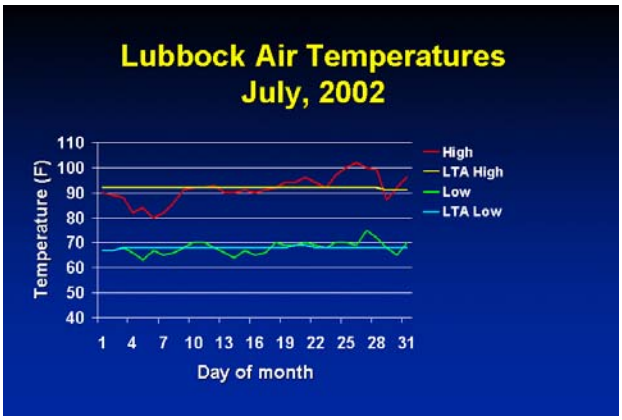
Adult Midge

Since it is after August 1, start scouting for midge in sorghum entering bloom. On average, the best time to scout is noon until 3:00 p.m., but you can start a bit sooner if nighttime temperatures are warm and the morning is warm. Why does time matter? The adult sorghum midge lives less than 24 hours, and females attempt to deposit all of their 50 or so eggs in a few hours. Adults (photo 1 | photo 2 | photo 3) are most active from mid-morning until mid-afternoon. Look for the tiny orange adults crawling on or flying around sorghum heads.

Our sorghum insect guide (see http://entowww.tamu.edu/extension/bulletins/b-1220.html) has a very good section on sorghum midge and provides economic thresholds for both midge-resistant and midge-susceptible sorghum varieties. **RPP**

COTTON AGRONOMY

Overview. During the last week, hot temperatures finally arrived and for the first time in 2002, the High Plains was basking in the sun under 100 degree temperatures. No widespread rainfall was obtained, but some scattered rainfall amounting to a few tenths occurred in some places. Some other more fortunate areas northwest of Lubbock (Lamb and Castro counties) reportedly received anywhere from a few tenths to up to three inches or so. The bad news was that some crop damaging hail was also encountered in some areas. Heat unit accumulation for the last week of July was certainly above normal as we ended up with a total of 612 DD60s at Lubbock this July, compared to the long-term average of 618. South Plains ET Network data indicate that the water use per day has been about 0.32 inches for blooming cotton for the last several days.



Most of the dryland cotton has reached cutout and considerable acres are under severe drought stress. Irrigated fields across the area are anywhere from cutout to 8 nodes above white flower where adequate moisture has been available. Fields that have reached cutout now have the heat unit clock ticking toward the goal of insecticide termination and harvest aid applications. We will discuss this more below. The objective now is to keep the water on the irrigated crop in order to keep it moving along. I have seen some excellent fields of irrigated cotton across the region over the last 2 weeks. If we can get another good, open fall there will be some outstanding yields.

Dryland drought disaster revisited. Getting a handle on the dryland crop has been very difficult due to numerous spotty rains across the parched areas of the High Plains. Estimates of the amount of failed dryland cotton acres has begun to firm up with the help of area USDA-FSA offices. In late June, we had estimated perhaps as many as 680,000 dryland acres would fail due to drought conditions. Scattered rainfall events in late June and early July resulted in more emergence than earlier estimated. It now appears that, based on FSA

office numbers, the failed dryland total is closer to 520,000 acres. Counties included in the survey were: Bailey, Cochran, Dawson, Gaines, Hockley, Howard, Martin, Midland, Parmer, Swisher, Terry, and Yoakum. Three counties would only report combined dryland and irrigated failed acres, but it is likely that minimal failed irrigated acres would have occurred in those. So, I suspect that overall, we can now safely say that at least 500,000 dryland acres were lost to drought conditions as of July 15.

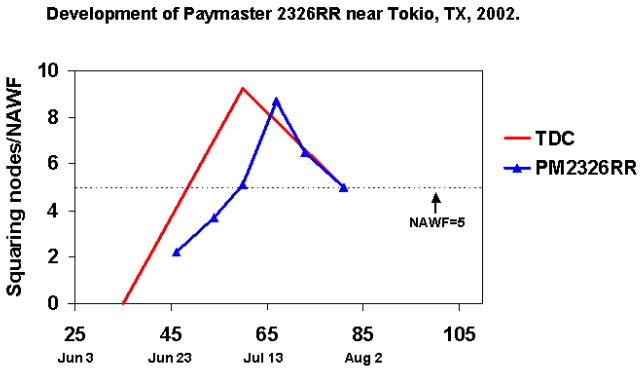
Cutout reached in many fields. Many fields across the area have now reached cutout, the 4-5 Nodes Above White Flower (NAWF) point. At this juncture, the growth of the mainstem is severely reduced or ceases, and the vertical flowering rate overcomes the rate of terminal growth, thus the cotton “blooms out the top.” Once this occurs the so-called “heat unit clock” starts ticking for some important management considerations. Over the last three seasons, we have worked with the COTMAN cotton management program. One of the key components of COTMAN for determining when to stop spraying for insects and when to apply harvest aids is identifying cutout. We have a lot of fields this year which exhibited physiological cutout fairly early, especially dryland fields.

Physiological cutout is defined as the point at which the plant reaches 5 NAWF after an extended bloom period. Many fields will vacillate around this 5 NAWF point for several days before finally “calling it quits”. When cotton "blooms out the top" and quits, this is an example of physiological cutout, but only if there is adequate time (heat units) to mature the bloom on that date.

Seasonal cutout is defined as the point in the season at which there is a low probability that a flower no longer has enough projected heat units (based on long-term temperature data sets) available to produce a high quality boll. 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 or may be of lower fiber quality (low micronaire). The one-third grown squares now on the plants will ultimately become the last effective blooms, if we assume that the last effective bloom dates are around mid-August. It is now apparent that we may have some cotton fields ready to terminate by mid to late September if things stay on track. **RB**

COTMAN PLANT MONITORING TOOL

As promised last week, we are providing a “real world” example of a growth curve and its corresponding “idealized Target Development Curve (TDC). This growth curve is for Paymaster 2326RR variety from the large plot systems trial planted near Tokio in 2002. The planting date on this test was May 9. Weekly



SQUAREMAN observations were made at the site beginning at 45 days after planting. Compared to TDC, the crop began squaring about 4-5 days late, probably due to poor heat distribution in May. After initiating squaring, the crop was somewhat under stress, as the growth curve deviated from the slope of the TDC until early July. After irrigation and good July growing conditions, development paralleled the TDC through about July 15. The crop entered bloom at about 9 NAWF,

exhibiting high vigor at early bloom. The next week's observation was 6.5 NAWF. On July 30, the field was near cutout. With the high level of fruit retention in the field (about 85% of first position fruit), the rapid decline in NAWF after first flower might not be so negative. At Muleshoe last year, we encountered a rapid decline in NAWF associated with high fruit retention and had upwards of 3 bale/acre yields with some varieties. I think the level of fruit load is important here in interpreting growth curves. This data suggests that under high retention conditions the NAWF line (slope) for a field could be steeper than the TDC projects and still result in a good yield. However, a steeper NAWF slope could also depict a moisture stress condition, but probably only if fruit retention was not exceptional. **RB**

DISEASE SITUATION

Reports of bacterial blight of cotton continue to pour in from consultants and producers. The forecast for the next week includes a higher than normal chance of rain. If this occurs, then defoliation will continue and bacterial lesions will begin forming on bolls. The only method of controlling this disease is by variety selection. Particularly alarming is the damage to dryland cotton fields. Unfortunately, now that the blight organism is well distributed across the High Plains, any year with good rainfall for dryland yields, will also be a year with a lot of bacterial blight. In 2001, a list was provided of resistant and susceptible varieties based on work at the TAES blight nursery at the Farm Show location in Lubbock. It is clear now that some of the Asusceptible@ varieties are much less affected than others. To help producers in their variety selection for 2003, a new list has been generated which divides susceptible varieties into several more categories.

Very Susceptible	Less Susceptible	Resistant or Immune
All-Tex Atlas	All-Tex Max-9	All-Tex Excess
All-Tex Atlas RR	BXN 16	FM 819
All-Tex Atlas Plus	PM 2145 RR	FM 832
All-Tex Excess Plus	PM 2200 RR	FM 958
All-Tex Top-Pick	PM 2280 BG/RR	FM 966
DP 2379	SG 501 BR	FM 989
DP 458 B/RR	ST 2454R	PM 280
FM 5013	ST 4892BR	PM 1218 BG/RR
FM 5024		PM 2167 RR
PM 183	**Moderately Resistant**	SG 747
PM 330	All-Tex Xpress	SG 215BG/RR
PM HS-26	All-Tex Xpress RR	ST 239
PM 2266 RR	SG 521 RR	ST 3539 BR
PM 2326 RR	ST 9905 BR	Syngenta NK2387C
PM 2326 BG/RR	Syngenta NK2165C	TAMCOT Sphinx
PM 2344 BG/RR		TAMCOT Pyramid
PM 2379 RR		
Phytogen 355		
Phytogen GA161		
Phytogen GA 894		
Phytogen HS-12		
Phytogen 952		
Phytogen 14512		
ST 474		
Texas 28R		

DP stands for DeltaPine
FM stands for FiberMax
PM stands for Paymaster
ST stands for Stoneville
SG stands for SureGrow

Peanut foliar diseases are becoming more common with the rainfall and humidity of this summer. Leaf spots are caused by several different fungi and if not controlled by fungicide applications, can result in substantial defoliation. I would recommend a protectant fungicide when leaf spots are first observed.

Fungicides that are recommended are provided in the Texas Peanut Production Guide (http://lubbock.tamu.edu/peanut/docs/PeanutProdGuide2001.pdf).

Pod rots, primarily caused by *Pythium* species continue to be the most common type to be sent in for identification. Many producers are applying Abound to control both *Pythium* and *Rhizoctonia*. Since Abound is much less effective against *Pythium* than *Rhizoctonia* pod rot, that may be the reason behind so much more *Pythium* pod rot in the last two years. If *Pythium* is the primary pod rot pathogen in a field, then a timely application of Ridomil may be critical to minimize pod rot. Once a *Pythium* pod rot problem is identified, it may be much more cost effective to use Ridomil, rather than Abound to control the disease. The delay by applying a less effective material against *Pythium* may result in high levels of pod rot. This is not a diatribe against Abound, which is a superb fungicide for control of *Rhizoctonia*, however, producers who have used it in an attempt to clean up a *Pythium* pod rot problem have only exasperated the problem. **TW**

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