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FOCUS on Entomology

For South Plains Agriculture

VOLUME XLI, NO. 4 June 28, 2002

Because of the four day 4th of July weekend, the next issue of FOCUS will not be released until Wednesday, July 10.

IN THIS ISSUE

COTTON INSECTS

Insect pressure in Texas High Plains cotton has been extremely light so far this year, at least for fields that have gotten beyond thrips damage vulnerability. Nevertheless, there has been some square shed reported across the area as most fields enter the squaring phase of their growth cycle. A few fields will even be blooming this week. One IPM agent described the conditions as an "ecological desert". I'm not complaining although I would like to see a few more beneficial insects out there. But without a food supply represented often times by pests, there can be no predacious natural enemies.

So what is the cause of this shedding? Many cotton agronomists and physiologists would have you believe that most if not all fruit shedding occurs from flower on, not in the square stage. They indicate that most if not all square shedding prior to bloom must be due to insect damage, caused by insects such as cotton fleahoppers and plant bugs or *Lygus*. If this is true, then I must ask why are plants shedding squares in the absence of observable numbers of these square thieves?

I believe the answer lies in environmental stress. Most agronomists or crop physiologists fail to fully appreciate the harsh environmental conditions that our west Texas cotton plants must contend with. Often they are faced with 95-105^0 F temperatures, high winds, low humidity, moisture deficits and blowing sand. And what about all those sand-fighting trips across the field each year? There are very few cotton growing regions that face this level of environmental stress. Therefore, before you get out your spray rig or call the aerial applicator, please check for insect pests if square set falls below your target.

There is another plausible but unlikely explanation for this mysterious square loss. Scouts, consultants and university entomologists could all have gone blind or be incompetent when it comes to finding these little critters. I don't think so!!! Admittedly,

they are hard to scout for and our sampling techniques and economic thresholds may leave a lot to be desired but we simply are not missing enough "bugs" to cause the observed square shed in some fields. Enough said on this subject. I am stepping off my soapbox now.

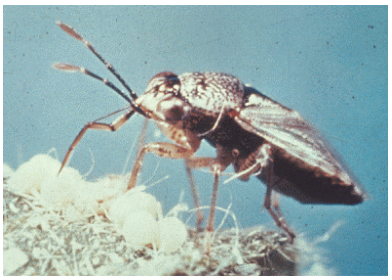
Do continue to monitor square set for both Lygus and fleahoppers. We've gotten this far without a problem, let's avoid a later unpleasant surprise. As plants begin to flower, if conditions are such that there are more squares present than can be held by the available plant vegetative structure, then you might see shedding in secondary or tertiary positions on the fruiting branches. If this occurs without loss of first position squares, then it is doubtful that insects are involved. Refer to publication E-6, Managing Cotton Insects in the High Plains, Rolling Plains and Trans Pecos Areas of Texas at: http://lubbock.tamu.edu/ipm/AgWeb/cotton/cotindex.html

The thrips situation is much improved this week although we are not entirely out of the woods yet. I will repeat what I said in previous FOCUS issues. While thrips have not been a problem for all cotton fields this year, their numbers and persistent infestations in many fields have put most thrips control measures under considerable pressure. This was a year where untreated fields with this level of pressure will have yields reduced by 20-30%. That's no hype! Even poorly timed foliar applications will more than pay for themselves although certainly not providing maximum benefits. Monti Vandiver (Parmer/Bailey County IPM Agent) and I completed leaf area measurement last week on our thrips control test NE of Farwell. The best treatment increased leaf area 268% over the untreated check. Which plants would you want in your fields? The better plants will have a structure that will be more conducive to setting and maturing larger numbers of fruit. What was the best treatment? Three weekly foliar applications of Orthene based on our economic thresholds in our management guide.

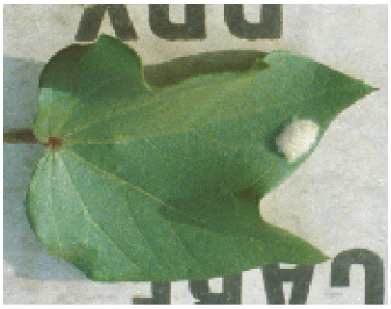
As expected, the single foliar Orthene application delayed until the 4th true leaf stage (when your last Roundup Ultra application is made) did not increase leaf area over the untreated check. Other treatments doing well were the seed treatments with two follow-up foliar applications of Orthene and the 5 lb./acre rate of Temik. The other Temik treatments (ranging from 2.5 to 4.0 lbs./acre) would have benefited from a foliar insecticide application although they too doubled leaf area over the untreated check. We will be mapping plants this week for square numbers, etc. It will be interesting to see what our treatments did to the bottom line---square numbers.

There are reports of our first significant bollworm egg lay going down in Gaines County. JoKirk Newbrough, IPM Agent in Seminole, reports that moth trap catches increased dramatically last week and are being followed by heavy egg laying in many fields this week. This latest activity may not be limited to Gaines County. You will need to get out there and check your own fields. Numbers in the 15,000 to 30,000 per acre range have been reported. But remember, eggs don't damage cotton, caterpillars do. So check on how many eggs produce damaging worms. Between natural enemies and heat stress, not too many eggs produce damaging worms. But if we get into a continuous, chronic egg laying routine, do expect some fields to trigger applications.

Other insects sighted in scouted cotton fields have included a few beet armyworms, aphids, a grasshopper or two and some natural enemies. These have included mainly crab spiders and ladybeetles but also big-eyed bugs and damsel bugs. Keep a lookout for beet armyworm egg masses. While beets have not been a concern so far, our



Adult Big-Eyed Bug



Beet armyworm egg mass

generally dry conditions and increasing spraying for boll weevil eradication could change the status quo. Grasshoppers continue to be reported as a problem in some fields but most of these have been southwest of Lubbock, especially in Gaines County, and represent a small percentage of our total acreage. We do see grasshoppers in other areas but they are thus far not in numbers sufficient to threaten cotton. Aphids too continue to be reported but their numbers remain thankfully low. Because of low numbers of pest insects, with the exception of thrips in some cases, there has been very little food out there to support natural enemies. I don't expect this to change real soon.

Beet armyworm egg mass

The boll weevil situation remains bright after ten weeks of running traps. Trap catches remain at low levels in the high Plains area both for the Texas Boll Weevil Eradication Foundation's traps and the Plains Cotton Growers/Texas Cooperative Extension GRID traps.

Average number of boll weevils per trap accumulated over 10 weeks.

Zone	2002	2001	2000
NWP	0.0002	0.025	0.185
WHP	0.0004	0.033	0.759
PB	0.00009	0.028	0.279
NHP	0.006	------	------
SHP	0.003	------	------

Acreage sprayed has increased dramatically this past week as many more fields reach squaring stage and hence are sprayed when the trap trigger of one weevil per field is reached. This is nothing to be alarmed about as it does not represent very much weevil pressure. Suppose you have a 100 acre cotton field which has an average of one weevil trap per 5 acres. This would mean there were 20 traps around this field. If only one trap caught a weevil, this field would be sprayed. The trigger used this year for all of our five zones is the normal one for the three zones that started in 1999 but is not typical of the trigger that would normally be used for the Northern High Plains and Southern High Plains zones in their first full season year. That trigger would typically be one weevil per trap or in the case of the example used above, 20 weevils caught for the 100 acre field. This may appear to be too aggressive but considering how low weevil numbers are this year, anything greater than this trigger would result in few acres sprayed and a "back sliding" of the program.

Acres sprayed this past program week and accumulative acres sprayed to this date

Zone	Week ending 6/23	Accumulative
NWP	487	796
WHP	202	394
PB	0	0
NHP	5,451	13,653
SHP	37,764	62,430

Most of the fields sprayed so far have been nearer towns, not out in the countryside. These "urban" weevils will continue to challenge the program. Speaking of challenge, two problems have surfaced that the foundation has had to contend with. The constant high winds have limited the time that applications can be made and a reddish beetle has invaded some of their traps and is eating any weevils trapped inside. These beetles are known as clerids or checkered beetles and are predacious. Although their habits may not seem to be very important, they are when you remember that our trigger is one weevil per field. One positive side of this

increased spraying by the Foundation is that the malathion applications are reducing numbers of fleahoppers and plant bugs present in these fields. Unfortunately, these same sprays do "knock out" our "beneficials" too. **JFL**

CORN, SORGHUM AND SUNFLOWER INSECTS

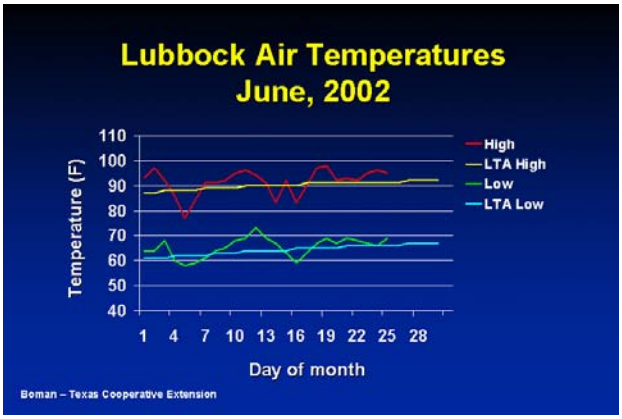
There is really not much happening now in non-cotton crops, which of course makes everyone a little nervous. In corn, southwestern and European corn borers have about finished the first flight and I have not heard of any field requiring treatment. Spider mites are still present and bear close monitoring. Corn earworm moths and larvae are fairly abundant. The sorghum pest situation is quiet as well. Corn leaf aphids are present but damage so far is not severe.

Painted lady butterflies and sunflower stem girdler adults are being found in sunflower. We still have no read on how severe the sunflower moth flight will be this year. Sunflower bloom is almost upon us and it might be a good time to mention that we have two short videos to help time sunflower moth applications. The first explains how to determine percent bloom in sunflowers, and the second discusses timing of insecticides for sunflower moth control. The videos are available in Real Media and QuickTime formats at http://lubbock.tamu.edu/sunflower/. Calvin Trostle and I kept the videos short to minimize download time. **RPP**

COTTON AGRONOMY

Overview. It appears that the long awaited "summer syndrome" may have arrived. Over the past week, conditions have been very favorable for cotton growth. Floyd County did get a major hit over last weekend and an additional 20,000 acres were damaged or destroyed according to initial estimates. Another big wind occurred late Wednesday night/early Thursday morning. Associated with that system, additional rainfall amounts across were obtained. Parts of Lynn County received up to 2 inches we are told. Additional spotty rainfall amounts of about 0.5 inches or so were noted in Gaines, Terry, Cochran, Yoakum, Dawson, Hockley, Lubbock, Crosby, Castro, Lamb and Bailey counties. All this further complicates the estimation of dryland losses due to drought (see below).

Cotton has really "taken off" with new growth in fields where conditions have allowed. Good growing conditions have helped many fields which were earlier damaged by various meteorological events. Temperatures over the last week or so have been slightly above normal. Less wind has been beneficial, not only to the plants, but to humans also. We



have obtained an average of about 22 heat units per day for the past few days at Lamesa, 21 at Lubbock, and about 20 at Halfway. Seasonal heat unit accumulations for a May 1 planting date have totaled 833 at Lamesa, 751 at Lubbock, and 657 at Halfway. The totals for June thus far are slightly above normal at Lubbock (460 in 2002 vs. 418 for the long-term average). Hopefully things will stay on track with better growing conditions.

Adjustment dates changed by USDA Risk Management Agency. A conference call to several agency administrators of RMA which involved Dr. Jackie Smith, Dr. John Gannaway, Jay Yates and myself was made last Thursday, June 20. Concerns and input by many parties, including Plains Cotton Growers, over a period of several days were directed to Ross

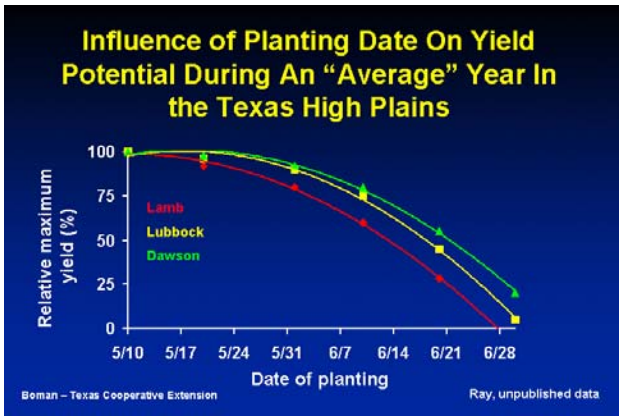
Davidson, Administrator of RMA. Appraisal dates for non-emerged cotton were changed. Bulletin No: MGR-02-011 was sent to all reinsured companies, RMA field offices and others on June 21. It stated that according to the 2002 Loss Adjustment Manual (LAM) Standards Handbook, appraisals for non-emerged seed for Texas cotton were supposed to be deferred at least 15 days after the end of the late planting period if the seeds had not emerged due to insufficient moisture. [Note: This language in the 2002 LAM essentially imposed a 30-day period of time from the final planting date before any non-emerged cotton was eligible for release.]

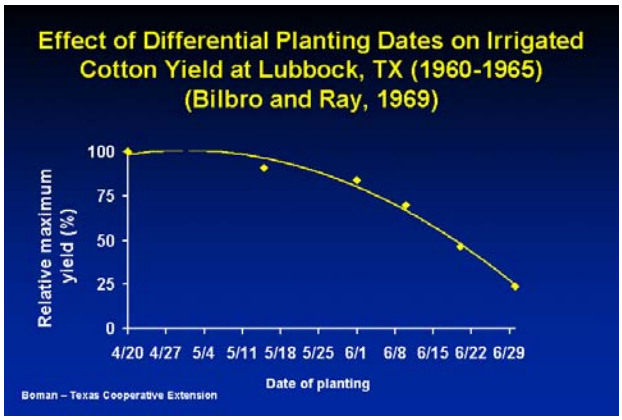
Due to continued extreme drought conditions, current agronomic data relative to Texas cotton production, and the current near term weather forecast a shorter waiting period was deemed appropriate for the 2002 crop year. Insurance providers were authorized to begin releasing cotton acreage, with non-emerged seed, in Texas as follows: For counties with a June 5, 2002, and earlier final planting date, release could begin June 25, 2002. For counties with a June 10, 2002, final planting date, release may begin effective June 30, 2002. Insurance providers must review each claim individually when making the determination to release non-emerged cotton acreage with zero appraised production to count. If the insurance provider believes for certain situations that a further delay of any appraisal and release may be necessary, they may take such appropriate action.

700,000 acre dryland cotton drought disaster unfolding. After many phone calls to Extension Agriculture and IPM agents across the region, and consultation with Johnny Anderson and Shawn Wade with Plains Cotton Growers, an estimate of non-emerged dryland cotton acres has been made. For the 25-county High Plains cotton region, the table below is our first estimate of failed dryland cotton acres. For 2002, we assumed a similar planted dryland acreage for the each county to be an average of the last couple of years. Total dryland planting expectations were 1.78 million acres. This table only estimates the non-emerged cotton at this time, and does NOT include any potential further deterioration of existing dryland stands which are in many cases in very poor condition. The data also indicate that the High Plains standing dryland acres is about 1.1 million at this time. Considerable dryland acres were "dusted in" and subsequently received only a few tenths to 1.5 inches of rainfall after planting. Unless additional timely rainfall is obtained over the next week or so, perhaps as much as an additional 500,000 acres across the region will be "under the gun." Several counties were "given the benefit of the doubt" when assembling the totals. Borden, Castro, Crosby, Deaf Smith, Dickens, Floyd, Garza, Hale, Lamb, Lubbock, Lynn, and Motley were all essentially considered "100% emerged," but there is very likely some acreage in some of those counties which is not emerged at this time.

County	Est. 2002 Planted Acres	% Non-Emerged	Est. Non-Emerged Acres
BAILEY	50,000	90.0%	45,000
BRISCOE	20,000	10.0%	2,000
COCHRAN	65,000	50.0%	32,500
DAWSON	253,000	50.0%	126,500
GAINES	120,000	70.0%	84,000
HOCKLEY	120,000	10.0%	12,000
HOWARD	125,000	65.0%	81,250
MARTIN	145,000	75.0%	108,750
MIDLAND	25,000	100.0%	25,000
PARMER	4,500	50.0%	2,250
SWISHER	9,000	75.0%	6,750
TERRY	140,000	70.0%	98,000
YOAKUM	80,000	75.0%	60,000
25-COUNTY TOTALS	1,156,500	59.1%	684,000

Plant window closing. Some producers continue to replant weather-beaten fields to





and Ray (1969) dataset includes data from studies planted from late April to June 30 during the 1960-1965 time period. I ran the heat unit accumulations for these years and determined that they were only very slightly "above normal" when compared to long term average data. According to the authors, the late April plantings in those years were not lost because of warm soil temperatures during that time. They also planted between 25 and 40 lb of seed/acre. Quite a difference when compared to today's seeding rates used with our expensive transgenic varieties. I feel that the numbers are still relevant based on additional information, which we obtained and submitted to RMA.

cotton across the area. My assessment of this is that the calendar date is now very risky. Based on "historical date of planting data" (Ray, unpublished data) and Bilbro and Ray, 1969, the planting window is rapidly closing across the region. One can expect greatly diminished yields, lower lint turnout and quality, and lower net revenue after mid-June at Lubbock. Based on first freeze dates for the region, this would imply that for the northern areas, around 7-10 days should be subtracted off the planting dates for similar effects, and for southern areas, perhaps 5-7 days could be added. The Bilbro

Agronomic and Economic Data (Bilbro and Ray, 1969)

Planting date	Yield	Lint turnout	Bur cotton	Color	Staple	Mic	Base loan value*	Mic discount	Actual loan value	Total value	Ginning cost	Net value
	lb/acre	%	lb/acre	grade	32nds	units	$/lb	points	$/lb	$/acre	$/acre	$/acre
April 20	953	24.3	3922	41	30.3	3.7	0.4210	10	0.4220	402.17	60.79	341.38
May 15	866	22.0	3936	41	30.2	3.5	0.4210	0	0.4210	364.59	61.01	303.57
June 1	800	22.4	3571	41	30.4	3.3	0.4210	-180	0.4030	322.40	55.36	267.04
June 10	662	21.8	3037	31	29.9	3.3	0.4265	-180	0.4085	270.43	47.07	223.36
June 20	442	18.3	2415	42	29.2	3.0	0.3960	-335	0.3625	160.23	37.44	122.79
June 30	225	14.4	1563	33	29.0	2.5	0.3860	-1115	0.2745	61.76	24.22	37.54

* 2001 USDA Loan chart used.
Assumes $1.55/cwt gin cost.
Assumes leaf grade 4.

Boman – Texas Cooperative Extension

Crop development schedule. Fields without environmental damage normally begin squaring at about 35-40 days after planting, or at about 525 heat units after planting. First fruiting branches should begin appearing at mainstem nodes 5-6. Some very vigorous fields may

actually initiate the first fruiting branch on node 4. Watch fields carefully in order to determine the status of fruiting. Check in the terminal to find pinhead-sized squares. Squares will be small, fuzzy, and pyramid shaped. When in doubt, pry bracts open on squares and look for a dome shaped structure. This is the flower bud.

Cotton development by heat units and calendar days.

From planting:	DD60s	Average (days)	Range (days)
To emergence	80	7	5-13
To first square	525	36	29-41
To first bloom	1065	61	45-81
To first open boll	1640	96	88-106

Cotton growth and development at systems trial locations. Cotton with adequate water is continuing to grow very rapidly. The Extension cotton technical staff headed by Mark Kelley has been busy this week obtaining COTMAN data (plant mapping) at our three Plains Cotton Growers-Plains Cotton Improvement Program/Cotton Incorporated funded systems variety trial sites. The sites have all escaped major environmental damage, with the exception of high winds. Data were collected near Cone (Appling Farms – 13 varieties), near Muleshoe (James Brown Farm – 13 varieties), and near Tokio (Rickey Bearden Farm – 15 varieties). Data were collected by plot and were averaged across three replications of each variety.

These data indicate that the crop at these locations is progressing very well at this time, and fruit retention is somewhat higher than what we experienced at this same time last year. Most picker varieties (Deltapine, Suregrow, and FiberMax) are generally getting the first fruiting branch out at node 6 or 7 on average. Stripper types (Paymaster, Stoneville Texas, AFD, All-Tex, FiberMax 5000 series, and Syngenta/NK) are averaging 4.5 to 6 for the node of first fruiting branch initiation. Plant stand densities at these locations are averaging about 51-65 thousand/acre.

N fertilization considerations for irrigated cotton. Nitrogen fertilization in irrigated fields making good progress should be considered. A one-bale cotton crop will actually remove about 45 lb of actual N per acre, but due to inefficiencies in uptake and in the soil, about 50-60 lb N/acre are actually required. Generally speaking, about 30-50 pounds of actual N per acre are adequate for dryland cotton. The higher rates should definitely be considered if the yield potential (stored soil moisture) is adequate for higher lint yields.

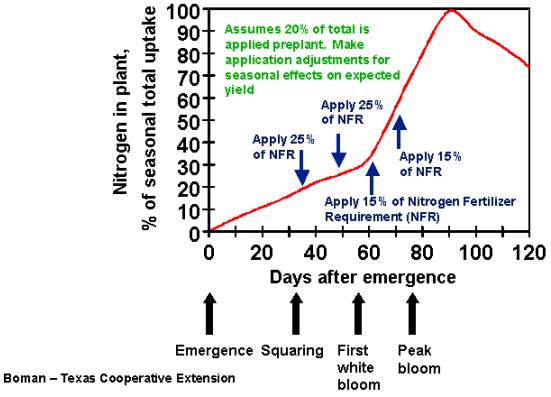
Sidedressing and/or topdressing should be completed before blooming, with extreme care taken to not prune roots during the application. Benefits from low rates of foliar fertilizers are questionable. Fertigation is a practice that is gaining in popularity in the High Plains. Figure 1 shows a typical N uptake curve for cotton and corresponding crop development stages. Suggestions for applications of approximate percentages

COTMAN data from PCIP large plot systems variety trials. 2002.

Location	Planting date	Mean mainstem node of first fruiting branch	Average square retention	Mean plant height, (inches)	Avg. # total mainstem nodes
Cone	May 7	6.0	85	6.6	10.6
Muleshoe	May 4	5.4	82	6.7	9.3
Tokio	May 9	5.3	88	6.3	8.5

of total N are also shown. These have been slightly modified compared to previous years' newsletters due to recent data, which have become available from Dr. Kevin Bronson's

Figure 1. Relationship between nitrogen in cotton plants (expressed as a percentage of total seasonal uptake) and days after emergence



(Lubbock Experiment Station Scientist) nitrogen uptake studies. Where possible, nitrogen fertilizer (UAN, 32-0-0) can be applied through center pivots or "fertigated". This results in lower application costs. One should consider whether a LEPA system with drop hoses is used vs. a spray system. If a pivot rigged with spray nozzles has marginal water quality and extremely hot, dry conditions are encountered, then some salt burn may be encountered on foliage. This type of N management fertigation scenario has been used and validated for the last several years at the Lamesa AGCARES facility using alternate furrow LEPA irrigation.

To obtain maximum utilization of applied N, the total amount of N should probably be applied prior to peak bloom. It is important to not over fertilize with N if reduced yield potential is anticipated. This is due to the fact that it makes late cotton more difficult to manage on the back side of the season. Some late-season insect problems, such as aphids, can be aggravated by high N status plants. **RB**

COTMAN PLANT MONITORING TOOL

I have been on a mission the last several years to evaluate, tweak, and to get cotton crop managers to adopt a crop monitoring/decision aid tool called COTMAN. I've emphasized the first two objectives until this year when we had our first open COTMAN training workshop. Although only a small number of folks have actually started using this tool, we have made some progress. A few consultants have been trained, as have many IPM agents, some specialists and several researchers. We are using this tool in some instances to monitor the crop and make management decisions. In other instances it is being used in research programs such as evaluating variety performance, various plant densities and thrips control strategies, to name a few. By the time we are through with this season, I hope to provide you enough insight to this tool so that you too will want to use it. We will have another training workshop next spring.

So what is COTMAN all about? This computer-based tool was initially developed by a team from the University of Arkansas consisting of entomologists, agronomists and economists. The leadership for this project was provided through the economists. After all, dollars are what drive the cotton production system. Others have joined this development effort over the years including irrigation engineers, pathologists and weed scientists. Several states have now checked in on this program. But the unifying force over the years has been the funding provided by Cotton, Incorporated. Other funding sources have been used but their funds represent the bulk of the support. I think this is a testament to their support for the usefulness of this tool.

COTMAN has two parts to its system: SQUAREMAN and BOLLMAN. The latter component is used to determine when insecticide treatment can be terminated for late season protection of bolls from pests such as

bollworms. It also helps determine when is the best time to apply a harvest aid material. Heat units are used for BOLLMAN decisions.

But the best part of the program is SQUAREMAN. It monitors plant stress as related to squaring prior to first flower. Really this is a fairly simple yet sophisticated tool to manage plant mapping information and provide insights into probable causes. By using SQUAREMAN during the pre-flowering period you can detect problems and implement corrective measures before it is too late. You still need to get out of the truck to plant map each field. You will still need to look at plants and the field for probable causes of poor growth and development. But at least you now have an early warning system.

So, what will SQUAREMAN give you? A report on each field every week it is mapped for starters. Square shed information to alert scouts of potential insect problems. A target development curve to tell you if your crop is too slow, too fast or right on time for high and early yields.

Next week I will go through the basic mechanics of mapping and running COTMAN so that you can see some of the useful output. Really this is not merely a research tool. It should be invaluable for those that want to be more attuned to their crop progress. **JFL**

IRRIGATION SCHEDULING

Not unusual for this area and for this time of year, scattered storms have produced highly variable precipitation on the South Plains. On June 26, Lamesa, O'Donnell, Seminole, and Tulia received no precipitation, while Brownfield, Seagraves, Levelland, and Anton received 0.43", 0.33", 0.22", and 0.86", respectively. These very localized storms make it difficult to assess the crop moisture situation.

What's the crop moisture situation right now? It depends. This may be a good time to get out the soil probes. Each field is likely to be different from others nearby.

Crop water use estimates based upon weather station data over the period June 19-June 26, 2002. Values are listed in inches per day.

Location	Cotton emerge	Cotton 1st square	Peanut begin flower	Peanut pegging	Sorghum emerge	Sorghum GPD
Halfway	0.17	0.20	0.23	0.33	0.13	0.25
Lubbock	0.16	0.20	0.13	0.32	0.13	0.25
Lamesa	0.17	0.30	0.16	0.33	0.13	0.27

For more specific crop evapotranspiration information, consult the South Plains ET Network daily summaries at:

Evapotranspiration summary for Lubbock:
http://lubbock.tamu.edu/irrigate/et/weather/lubbock.fx

Evapotranspiration summary for Halfway:
http://lubbock.tamu.edu/irrigate/et/weather/halfway.fx

Evapotranspiration summary for Lamesa:
http://lubbock.tamu.edu/irrigate/et/weather/lamesa.fx

SPECIAL SUPPLEMENT

See the attached PDF file on How to Read the South Plains Evapotranspiration Information.

DP

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