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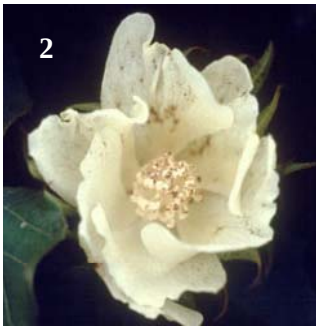
COTTON INSECTS

In general it has not been much of a year for pest problems. Have we sprayed much to date? Not really---probably more than 10,000 acres but less than 100,000 acres to be sure. Cotton fleahoppers weren't much of a problem for our earlier planted cotton but remain a pest of importance until the later cotton is one to two weeks into bloom. Lygus bugs (more specifically the western tarnished plant bug) have been a rare problem, mostly associated with weedy areas or alfalfa that has been cut, disked or otherwise rendered unsuitable as a host. Lygus bugs could be more of a problem as we move well into flower. We are in our July bollworm wave with mostly sub-economic infestations developing. There are scattered beet armyworms lurking in several fields and they may or may not pose a problem down the road. Aphids remain at low levels, acting as a food source for our developing natural enemy populations. The first field generation of pink bollworms should be coming off in our earlier planted fields between now and the end of the month. And finally, boll weevil trap catches have dropped precipitously, mostly because weevils are moving into fruiting fields but also because the eradication program is relentlessly pursuing them.

Cotton fleahoppers have failed to be a significant problem this far. Older cotton is out of the woods with this pest but later cotton, cotton that is not flowering yet or high yielding fields that are still in early bloom are still vulnerable. Remember that fleahoppers attack the tiniest squares, pinhead- sized. These are associated with leaves that are still rolled up. Once your yield potential has been realized and this is represented in larger squares, blooms and bolls, stop fussing with this tiny pest. They can now be considered helpful, as they also will feed on other insects that remain pests of your cotton. They are also food for larger predators. Square set has remained above 80% for the vast majority of fields that are 3-5 weeks into fruiting.

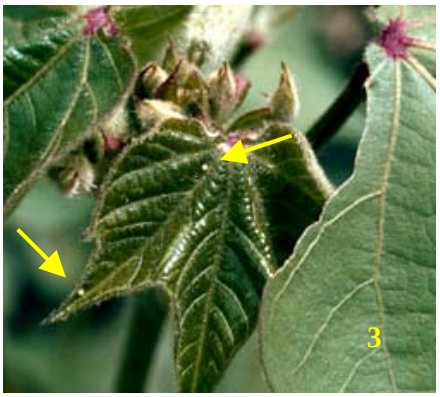
Fleahopper feeding on egg

Lygus bug (western tarnished plant bugs) numbers remain at very low levels in most fields we are checking. Surveys conducted through Dr. Megha Parajulee's research program at Lubbock through last week have continued to show low numbers in cotton as well as weed hosts. If Lygus bugs are to become a problem this year it will probably be later in the bloom cycle. Remember that bolls are still vulnerable to damage and hence yield loss and fiber quality reduction until at least 350 Heat Units have accumulated past white flower.



Dirty bloom

The first cycle of bollworm activity continues in the southern areas of the High Plains. Eggs continue to be found and later small worms but few of these make it past ½ inch size (5 days old). Except for a very few fields, our cotton crop has not experienced acute economic infestation levels to this point. That means that infestations of 3-4 day old worms have failed to break the 10,000 per acre economic threshold barrier I use. You should be using this level too unless you have trouble finding smaller worms. If you do, hire someone than doesn't have this problem!

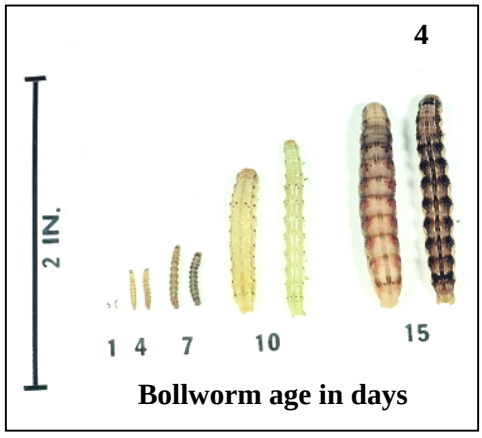


Eggs on terminal leaf

The biggest problem I see developing is possibly sub-economic, chronic infestations that linger for 2-5 weeks. Once you see these, developing the science of bollworm management becomes somewhat compromised and the "art" of management learned through experience and making mistakes kicks in. At some point, if you have continued to monitor fruit retention, you will find yourself unhappy with the declining fruit load. At this point you have a decision to make. If eggs continue to be found and small worm survival is allowing some worms to accumulate each day, I say it is time to spray.

Coverage is still not a big problem at this time and so some of the pyrethroid alternatives such as Steward, Tracer, Denim, Lannate, Larvin and Curacron should be considered to avoid increasing aphid problems, spider mite problems, and perhaps beet armyworm problems. These materials will only give you fair control compared to standard control associated with pyrethroids but that level of control is probably good enough for this time of year when coverage is not as big a problem and infestation levels are lower.

I am providing insecticide-rating charts for not only caterpillars but also a whole host of other potential pests. These are national rankings that research and extension cotton entomologists from across the cotton belt compile at a meeting in October each year. My only criticism is that we tend to get better performance out of these foliar insecticides than our friends to the east and west of Texas.



Bollworm age in days

The first serious wave of bollworm activity won't be until early to mid August when they exit maturing corn and we become the recipient of long distance flights of bollworms from south Texas and the Southern Rolling Plains. Then we also have to worry about potential pyrethroid resistance because of their exposure to these insecticides in earlier generations down south.

Pink bollworms continue to emerge from overwintering sites around the Lubbock area but emergence is over for areas near San Angelo and Midland (see Plains Cotton Growers "Pink Bollworm Information"). Very little spraying has occurred compared to last year in the Gaines/Yoakum County area but this is mainly due to more Bollgard acreage and fewer producers selecting the sprayed refuge option over the 5% unsprayed option. We have caught more moths this year so far but their numbers are generally down now (see chart).

Remember that no insecticides with caterpillar activity can be applied to the unsprayed refuge, even for loopers or beet armyworms. Banned insecticides include: Orthene, Intrepid, Thiodan, pyrethroids, methyl parathion, Curacron, Bolstar, Tracer, Denim, Lannate, Steward, Larvin, foliar Bt products, pepper and garlic sprays and the pink bollworm pheromone, gossyplure. So Lygus bug control can be somewhat problematic.

The first in field generation of moths is present in the earlier planted infested fields. Only 1,930 heat units accumulated from January 1 were needed for this. Both Midland and San Angelo areas are above that level whereas Lubbock will be there in less than a week? Once cotton is blooming and small bolls are present, trap catches should not be used to determine the need to treat. Early in the blooming cycle you can survey white blooms to determine if there is any pink bollworm activity in your field---especially fields need traps that have caught moths. Look for rosetted blooms---those blooms that take on a pinwheel appearance. But treatment decisions must then be based on infested boll counts, not rosetted blooms or trap catches.

Rosetted blooms

To determine if a boll is infested you must break it open and look at the inside of the carpal or boll wall. Look for a tiny wart; some associated stained lint and a worm that may be very small, almost clear at first and thread-like in size. Later they grow to a size easily found and attain their characteristic pink color. For more pink bollworm information see Pink Bollworm Management Tips I in the Crop Production Guide Series of FOCUS and Pink Bollworm Management In Texas.

Wart and small larvae

A few beet armyworms have popped up but no treatable infestations at this time. There are reports of a few problem fields developing in the Garden City area but these are associated with fields that have been sprayed several times in the boll weevil eradication program. As long as our cotton fields remain relatively pesticide free, natural enemies and heat should keep our beet armyworm damage potential to a minimum. If not, my first insecticide choice will be Intrepid. In dealing with mixed bollworm/beet armyworm infestations insecticide selection becomes more problematic. I'll discuss this more if we move in that direction.

Beet armyworm egg mass

Trap catches have dropped significantly over the last two weeks. While I'd like to say this is all due to the eradication program---it isn't! As much of our cotton is squaring or blooming, fields have become much more

attractive to boll weevils than our traps. Overwinter boll weevil emergence is all but over with a few stragglers left to emerge. A weevil has been caught over near Levelland and also down near Plains. Acreage around these catches will be sprayed for three weeks. Otherwise, High Plains trap catches are basically zero except for low numbers in the Permian Basin and St. Lawrence zones. In spite of some weevil catches (some before cotton was hostable) less than 161,000 acre treatments have been made across the 7 zones from St. Lawrence to the Panhandle zone. Folks, we are just about there as far as eradication is concerned!!

Average number of boll weevils caught per trap inspection and sprayed acreage through July 10. Number of boll weevils caught for the week ending July 10, 2005.

High Plains Zone	2005	2004	Sprayed acres	Total weevils caught this week
Permian Basin	0.0405	0.011	96,114	96
Western High Plains	0	0.00001	0	0
Southern High Plains	0.00004	0.0001	9,618	0
Northern High Plains	0	0.00001	0	0
Northwest Plains	0	0	0	0
Panhandle	0	NA	0	0
St. Lawrence	0.5159	NA	21,274	699

Average number of boll weevils caught per trap inspection and sprayed acreage through July 17. Number of boll weevils caught for the week ending July 17, 2005.

High Plains Zone	2005	2004	Sprayed acres	Total weevils caught this week
Permian Basin	0.0345	0.0099	124,628	87
Western High Plains	0.00001	0.00001	1,366	3
Southern High Plains	0.00004	0.0001	13,196	0
Northern High Plains	0	0.00001	0	0
Northwest Plains	0	0	0	0
Panhandle	0	NA	0	0
St. Lawrence	0.3952	NA	23,866	167

The Valley is into their program with an interruption caused by hurricane Emily. Luckily the cotton crop was impacted very little but the Texas Boll Weevil Eradication Program is probably going to have a set back of about one week. Hopefully the winds associated with this hurricane did not push very many weevils northward into nearby zones.
JFL

COTTON AGRONOMY

Weather conditions across the region remain hot and dry. Daytime high temperatures for July have been running just above normal, and the lows are somewhat above normal. July heat units are now just about 4% above normal for the month. For the season, we are running about 9% above normal (for a May 1 planting date) at this time (see seasonal HU accumulation).

The last measurable precipitation at Lubbock was about two weeks ago. Some dryland areas, generally south of a line from about Plains down to Lamesa are very dry and have not had much rainfall since planting. I suspect that many of these fields will be under major stress fairly quickly. Otherwise, well-watered cotton in good condition continues excellent growth. Some cotton has now been blooming for 2 weeks or so and much of the later planted cotton is now into early bloom. As we head into the home stretch for the month of July, many producers need rainfall to ease their minds for dryland cotton and to reduce pumping costs for irrigated fields.

We still believe that we have around 3.4 million acres standing out there (which includes perhaps about 200,000 acres replanted after late weather events). But the question now becomes – just how productive will the dryland acreage be? Sounds to me like another High Plains cliffhanger. Many producers are in the process of cultivating and performing hooded sprayer operations in fields. Some fields that have excellent growth are going to be too large to get tractors through very quickly.

Plant monitoring. Monitoring fruiting is an important management consideration. First position fruit is very quickly counted, and is generally adequate for "getting a handle on the crop" (see Figure 1). At early bloom, up to 80% of the harvestable crop will be on the plant in the form of squares and blooms. We like to see at least 80% square retention going into the first week of bloom. Many times, High Plains fields will enter blooming with square retention greater than that. Plant mapping can be used to help monitor the progress of the crop and determine some important crop factors.

Important plant mapping data at early bloom are:

1. Total 1st position squares present and missing (retained squares / total square sites = % square retention). Square retention goal is 75 - 85% 14 days after early bloom.

2. Total 1st position bolls present and missing (retained bolls / total boll sites = % boll retention).

3. Nodes above white flower (NAWF). To determine NAWF see Figure 2.

Nodes above white flower **at first bloom** gives an indication of crop vigor and yield potential. Typically, NAWF should be high at first bloom and then decrease as the boll load ties down the plant, and mainstem node production rate slows or ceases. For the High Plains region, greater than 8 NAWF could be considered excellent, 6-7---reduced yield potential possible unless adequate irrigation is quickly initiated or rainfall obtained, 4-5 or less---cutout imminent on more determinate varieties. Of course with so many varieties and many of the picker types being more indeterminate than many of our older stripper types, their ability to hang in there without cutting out is certainly worth consideration. Water (rainfall, irrigation) is the key with these variety types. In many years, we can enter bloom in irrigated fields at 8 or so NAWF. Last year, due to good early growing conditions and excellent rainfall distribution, many fields---even dryland fields---entered first bloom with around 10 NAWF and thus the reason for the record crop production. Many fields that were stressed for moisture may have

a short bloom period due to few NAWF at early bloom. **RB**

FUSARIUM WILT/ROOT-KNOT NEMATODE UPDATE

In the last several weeks, Fusarium wilt damage has been on the increase. This disease is capable of killing plants quickly, or working its way up the plant slowly, resulting in more distinct leaf symptoms (more pictures). In all cases where significant wilt damage has been brought to our attention, root-knot nematodes have been present. This wilt disease continues to grow in importance because of the varieties that are currently popular in our area. The stripper type varieties like PM 2280BR, PM 2379RR, and All-Tex Atlas are more resistant to this disease (see table). However, as producers continue to grow more susceptible varieties such as FM 958, damage will become more widespread.

Stand loss from fusarium wilt

In some cases, consultants or producers are still confusing Fusarium wilt damage with herbicide injury. The leaf symptoms associated with Fusarium wilt are distinctly different than herbicide injury, and the two should not be confused. The Plains Cotton Improvement Association is supporting variety testing in fields with Fusarium wilt. The associated table provides the relative ranking of varieties tested in 2004, and also tests that are currently being conducted in 2005. The 2005 data is still continuing to change, so results will be updated over the summer. The 2005 tests are being conducted at two sites, and results may be inconsistent between sites.

Leaf symptoms from fusarium wilt

Management suggestions include:

1) Correct diagnosis of disease (Is it wilt?--- if so, is it Fusarium wilt or Verticillium wilt?). In 2004, there was a lot of Verticillium wilt, but also some Fusarium wilt. This year, because of the higher temperatures, Fusarium wilt is much more prevalent than Verticillium wilt.

2) Plant a less susceptible Fusarium wilt variety. Varieties that are highly susceptible to Fusarium wilt will have more plants dying from wilt by 40 days after planting than more resistant varieties (see graph). The most susceptible varieties (BCG 245, BCG 295, DP 449BR, and FM 958 - dotted lines in the graph) had a much higher incidence of plants dead from wilt on June 22 than the most resistant ones (PM 2379RR, NexGen 3969R, NexGen 2448R, and All-Tex Atlas - solid lines in graph). Note that NG 2448R is one of most wilt resistant varieties in Lamesa, but one of the most susceptible in Olton. Wilt resistance may differ with different isolates of the fungus Fusarium. The plants at Lamesa are dying from wilt, while those in Olton are primarily showing leaf symptoms consistent with wilt. In the last two weeks, the percentage of plants dying in the most susceptible varieties has continued at a slightly higher pace than the most resistant varieties.

3) Use Temik 15G at 5-7 lbs/acre at planting. The use of Temik 15G at planting in Fusarium wilt/root-knot nematode infested fields should increase yields by approximately 25% across

most varieties. All varieties tested in 2004 showed a substantial yield increase with the use of Temik, including the most resistant varieties.

4) After a terrible Fusarium wilt year, it would be beneficial to rotate away from cotton for one year and then choose a relatively resistant cotton variety the next year. Peanut is the preferred rotation crop, since root-knot nematode will not be able to reproduce on peanut. This will lower the nematode population, though the Fusarium wilt fungus does survive several years in the soil without a host present. It may take 3-4 years to lower Fusarium wilt levels so that a susceptible variety can be grown successfully. **TW & GS**

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