NATIONAL COTTON COUNCIL

Cotton Physiology Today

Newsletter of the Cotton Physiology Education Program Volume 11, Number 2, 2000

The 2000 Production Year

Four specialists, one from each region of the U.S. Cotton Belt, share their synopses of the 2000 production year. Two regions, the Mid-South and Southeast, received no significant rainfall until harvest. Many dryland producers watched their crops burn up in the field. In a few locations, cotton sprouted in bolls waiting for the fields to dry enough to be harvested (Figure 1).

West (AZ, CA)

An unusual year in that it was favorable in many ways. Reasonably good planting weather, no extremely hot periods, and an early fall made it a good year to be producing cotton – and a very different environment than the preceding two years with very cold, wet planting periods, cool spring weather, and unusually high temperatures mid-season. Problems occurred in isolated pockets of the San Joaquin Valley: some fields received hail and had to be replanted; other limited areas had early fall rains that affected quality and delayed harvest; an increased occurrence of Rhizoctonia (damping off) seedling disease also necessitated replanting of some fields.

Insect populations were somewhat atypical throughout the season. Lygus pressure was unusually low through early and mid-season in most areas, resulting in very good fruit retention and a compressed growing season. More aphids occurred mid- to late season in 2000 than in 1999. Silverleaf whitefly reached treatable levels in several counties. Thrips affected about one-third of the acres and caused early leaf and meristem damage — non-Acala upland varieties were the most affected. Perhaps as a result of new acreage of corn and tomatoes (alternate hosts), bollworm reached treatable levels in the southern San Joaquin Valley for the first time in many years.

S.M. Brown

Figure 1. Some cotton sprouted in bolls.

INSIDE:

The Cotton Physiology Education Program (CPEP), now in its 12th year, is funded by a grant to the Cotton Foundation by BASF, makers of Pix®Plus plant regulator. CPEP's mission is to discover and communicate more profitable methods of producing cotton.

AUTHORS:

Anne F. Wrona, National Cotton Council; Randy Boman, Texas A&M University; Steven M. Brown, University of Georgia; Robert B. Hutmacher, University of California; William C. Roberston, University of Arkansas

Southwest (NM, OK, TX)

The best of all possible conditions launched the growing season on the High Plains. May temperatures 5.2° F above normal got the crop off to a good start. June weather included 8.5" of rain (compared to a normal 2.75") and cool temperatures. July rainfall and temperatures were about normal, but all precipitation came before the 20th of the month. August temperatures were 3.3° F above normal; only 0.01" (instead of the normal 2.51") of rain fell. September continued with temperatures 3.5° F above normal and only a trace of precipitation.

Although plenty of moisture got the crop off to a good start in the High Plains, lack of rain and higher-than-normal temperatures meant that root systems could not support the heavy early fruit load. Record dry conditions continued through August and September as dryland producers watched their prospects for good crops disappear.

On October 10th, 75 days after any precipitation of significance, rain started falling, totalling up to 3 inches over a 3 to 4 week period. Harvest was delayed. Color quality decreased.

Classing results revealed about ½ million bales of an early crop of high quality (good color and leaf; very little bark). Drip irrigated cotton did particularly well (Figure 2). This cotton was harvested before the October deluge of rain. Due to no rain in August and September, cotton fiber could not grow at a critical time in its development, so some of the cotton had low micronaire.

R.K. Boman

Figure 2. Drip irrigated cotton of high yield and quality.

Beet armyworm infestations were the heaviest observed since 1980. Because of aggressive control, yield losses were minimized, but costs soared. Multiple pests included cabbage loopers, bollworms, boll weevils, and aphids.

Boll weevil numbers in the three active zones in the High Plains (Northwest, Permian Basin and Western) were greatly reduced by the eradication program. However, some weevils migrated from New Mexico and inactive zones into the Northwest Zone in late season. The southern Rolling Plains was declared functionally eradicated in 2000. Other active zones across the state made good progress. The remaining High Plains zones passed boll weevil eradication referenda and will initiate programs in 2001.

Mid-South (AR, LA, MO, MS, TN)

In 2000, a slow, rough start did not cheer producers. In Arkansas about 80% of the cotton is usually planted the first 10 days of May. This year, because of rain in May, some was planted very late, even in June. The cotton planted in April seemed to do the best, provided it had supplemental irrigation. Good rainfall came through June. No more came for the rest of the season.

For some growers, planting wheat in the row middles helped reduce the ravages of wind and sand blasting early in the season. The wind also contributed to significant drift of herbicides, particularly of Roundup Ultra unto conventional crops. Unusually high populations of root knot nematodes occurred early in the season in some areas.

Whereas tobacco thrips are usually a problem in Delta cotton, this year a mix of tobacco and western flower thrips moved into the cotton early season. This mix resulted in more damage than is usual because the pesticides effective against tobacco thrips did not work as well on the western flower thrips. Aphids were at higher levels than normal earlier in the season. The fungus, *Neozygites*, brought their levels down in July. Spider mites were at populations higher than normal and required continual attention.

Those growers who irrigated were rewarded for attention to timeliness. Watering before any water stress symptoms occurred paid off with growers netting 1200 to1500 lbs./acre. Watering 10 to 14 days late netted lower yields, somewhere between 650 and 750 lbs./acre. Because of the high temperatures and lack of rainfall, many pivots were run continuously, some even got stuck in ruts.

Growers using polypipe and shorter rows found they could get water across their farms rapidly. Gates in polypipe allowed more rapid and effective irrigation (Figure 3). Those relying on towable pivots courted disaster because they needed them on constantly. Dedicated pivots were never shut off.

The silver lining in the dry season was the graded color of the crop – one of the whitest in a long time. Micronaire was not as prevalent a discount in Arkansas, because although August temperatures were high, there were brief periods of lower nighttime temperatures. In Mississippi, however, nighttime temperatures remained high and growers suffered the consequences of higher micronaire.

Don Plunkett

Figure 3. Gated polypipe.

Southeast (AL, FL, GA, NC, SC, VA)

The third year of drought saw some cotton acreage abandoned in Georgia and the third year of poor yields. Georgia growers planted 80% of the acreage to transgenic lines (35% stacked, 30% Roundup-ready, 15% Bollgard, <1% BXN). No significant rainfall occurred until the first week of harvest (September). Consequently, some cotton was lost to boll rot, but color remained good.

Worm pressure was fairly light across the state. However, aphids were severe and widespread. In July their populations crashed due to infestation by the parasitic fungus, *Neozygites*. For the second year silverleaf whiteflies affected an area of more than 100 square miles. Stinkbugs were a prevalent pest. Typically 100 to 125 lbs./acre can be lost to stink bugs.

Seedling disease was light, but more Fusarium wilt was seen in spotted areas, generally in association with root knot nematodes. The fungus causing Fusarium wilt plugs the water-conducting tissue in the center of the stem which appears dark (Figure 4). The crop wilts and yields suffer. In the absence of good rotations, nematode populations, particularly the reniform, increased.

S.M. Brown

Figure 4. Darkened center of stem – symptom of Fusarium wilt.

Beltwide Summary

Table 1. Approximate percentage of total planted acreage in specific cotton varieties in 2000. (Source: USDA)

REGION	Company	Variety	~ % Acreage
West	CPCSD*	Acala Maxxa	20.48
	Deltapine	NC 33B	10.59
	CPCSD*	Acala Riata RR	9.06
	CPCSD*	Acala GTO Maxxa	6.58
	Deltapine	DP 458 B/RR	3.41
	Deltapine	DP 6211 Acala	3.25
	Stoneville	BXN 47	3.24
Southwest	Paymaster	PM 2326 RR	25.47
	Paymaster	PM 2200 RR	14.53
	Paymaster	HS 26	11.37
	Paymaster	PM 2145 RR	3.66
	Paymaster	HS 200	3.17
	Deltapine	DP 50	2.83
	Deltapine	DP 2379	2.49
Mid-South	Stoneville	BXN 47	15.66
	Deltapine	DP 451 B/RR	15.56
	Paymaster	PM 1218 BG/RR	14.58
	Deltapine	NC 33B	9.55
	Deltapine	DP 458 B/RR	5.94
	Stoneville	ST 4691 B	4.46
	Stoneville	ST 474	4.27
Southeast	Deltapine	DP 458 B/RR	13.33
	Deltapine	DP 5690 RR	6.80
	Deltapine	DP 655 B/RR	6.37
	Deltapine	DP 451 B/RR	5.44
	Sure-Grow	SG 125 BR	5.07
	Deltapine	DP 90 RR	4.34
	Stoneville	BXN 47	3.97
Beltwide	Paymaster	PM 2326 RR	9.48
	Stoneville	BXN 47	6.61
	Deltapine	DP 451 B/RR	6.41
	Paymaster	PM 1218 BG/RR	5.88
	Deltapine	DP 458 B/RR	5.72
	Paymaster	PM 2200 RR	5.40
	Deltapine	NC 33 B	5.01

*California Planting Cotton Seed Distributors

The varieties planted to the most acreage in the different regions are listed in Table 1. Transgenics totaled about 72% of plantings (up another 12% from 1999).

Beltwide harvested acreage was down slightly from 1999 and the five-year average, largely due to lost acres in the Southwest (Table 2). The West, Mid-South, and Southeast gained a little harvest acreage over the 5-year averages for these regions.

Table 2. Harvested acreages of U.S. upland cotton — '00, '99, and over the last five years (5 year). (Source: USDA December figures)

	Acreage, million acres		
REGION	'00	'99	5 Year
West	1.05	0.87	1.16
Southwest	4.66	5.36	4.96
Mid-South	3.88	3.69	3.78
Southeast	3.23	3.22	3.13
TOTAL	**12.78**	**13.14**	**13.03**

Pima acreage harvested dropped in 2000 compared to 1999 and the 5 year average Beltwide and in each of the states growing this species (Table 3). The most notable drops in acreage occurred in California where about two thirds as much was grown as in 1999, in Arizona where less than a fourth and in Texas where about half as much Pima was harvested as was typical the last 5 years, respectively.

Table 3. Harvested acreages of U.S. pima cotton — '00, '99, and over the last five years (5 year). (Source: USDA December figures)

	Acreage, thousand acres		
STATE	'00	'99	5 Year
Arizona	6	9	27
California	144	239	176
New Mexico	5	7	11
Texas	16	32	33
TOTAL	**171**	**287**	**247**

In 2000 yields increased over 1999 values in the West and Southeast and decreased in the Southwest and Mid-South compared to 1999 values and 5 year averages (Table 4).

Table 4. Yields of U.S. upland cotton — '00, '99, and 5-year averages. (Source: USDA)

	Yield, pounds per acre		
REGION	'00	'99	5 Year
West	1356	1261	1109
Southwest	437	477	461
Mid-South	662	667	685
Southeast	623	529	608
AVERAGE	**627**	**595**	**619**

With the exception of Texas where Pima cotton yields increased, Beltwide yields decreased compared to 1999 values (Table 5). However, all states producing Pima had higher yields than their 5-year averages.

Table 5. Yields of U.S. pima cotton — '00, '99, and 5-year averages. (Source: USDA)

	Yield, pounds per acre		
STATE	**'00**	**'99**	**5 Year**
Arizona	824	853	594
California	1167	1211	1153
New Mexico	768	754	550
Texas	900	675	703
AVERAGE	**1114**	**1129**	**1007**

Production in million bales increased Beltwide from 1999, but decreased slightly from the 5-year average (Table 6). Production in the Southwest was lower than in 1999 and the 5-year average.

Table 6. Production of U.S. upland cotton — '00, '99, and 5-year averages. (Source: USDA)

	Production, million bales		
REGION	**'00**	**'99**	**5 Year**
West	2.96	2.30	2.67
Southwest	4.24	5.33	4.76
Mid-South	5.35	5.13	5.40
Southeast	4.16	3.55	3.96
AVERAGE	**16.70**	**16.24**	**16.80**

Conclusions

A decrease in harvested acreage, most notably in the Southwest, meant decreased production compared to 1999 and the 5-year average. Although weather hurt producer's yields in the Mid-South and Southeast, fine-tuned production practices and extensive use of transgenics (72% of harvested acreage) contributed to better yields Beltwide than in 1999 or the 5-year average.

Mention of a specific product does not imply endorsement of it over any other product.