NATIONAL COTTON COUNCIL

Cotton Physiology Today

Newsletter of the Cotton Physiology Education Program

Volume 8, Number 4, 1997

The 1997 Production Year in Review

Exciting changes are afoot in the cotton industry — many spawned by the new Farm Bill, many just evolving gradually as change is wont to do. Here we review the highlights of the 1997 production year and focus on some of the new technologies allowing growers to maintain profitability, in spite of reduced government support.

Weather Set the Stage

Cotton got off to a slow start in several regions of the U.S. Cotton Belt (Figure 1). Cold and wet conditions in the Mid-South and Southeast delayed planting.

Figure 1. Emerging cotton seedlings.

In the Southeast, growers planted late and had some reasonable weather immediately after planting. However, drought in July and August so damaged their crops that yields were quite poor.

The rainfed areas of the Southwest received rain in a timely fashion througout the season. Yields and production reflected this good start.

In Arizona, cotton was planted in a good "window" of weather. However, in several places across the state, high winds and cold fronts following planting resulted in very poor stand establishment. Many fields had to be replanted.

INSIDE:

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

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Varieties: Transgenics Well-Represented

In 1997, growers very carefully selected varieties adapted to their local conditions. High on the list were varieties giving good yields and reliable performance. The varieties planted to the most acreage in the different regions (Figure 2) are shown in Table 1.

Table 1. Approximate percentage of total planted acreage by region in specific cotton varieties in 1997.

Region	Company	Variety	~ % Acreage
West	CPCSD*	Acala Maxxa	51.08
	Deltapine	NuCotn 33B	14.24
	Phytogen	Phy 33 Acala	5.18
	Deltapine	NuCotn 35B	3.45
	CPCSD*	Acala SJ2	2.50
	Deltapine	DP 5415	2.43
	New Mexico State	Acala 1517-91	2.22
Southwest	Paymaster	HS 26	33.14
	Paymaster	HS 200	14.69
	Deltapine	DP 50	5.14
	All-Tex	All-Tex Atlas	2.92
	Deltapine	Acala 90	2.76
	Paymaster	PM 145	2.64
	Deltapine	DP 5690	2.55
Mid-South	Stoneville	ST 474	19.95
	Deltapine	NuCotn 33B	17.70
	Sure-Grow	SG 125	10.21
	Deltapine	DP 20	7.84
	Deltapine	DP 50	7.36
	Deltapine	DP 51	6.84
	Sure-Grow	SG 501	4.09
Southeast	Deltapine	NuCotn 33B	22.40
	Deltapine	NuCotn 35B	11.38
	Deltapine	Acala 90	10.56
	Deltapine	DP 51	10.26
	Deltapine	DP 5415	6.11
	Stoneville	ST 474	5.82
	Sure-Grow	SG 125	4.84

*California Planting Cotton Seed Distributors

Table 2. Millions of commercial acres of the U.S. Cotton Belt planted in transgenic cotton varieties in 1996 and 1997.

	1997	1996
Bt	2.5	1.8
BXN	0.3	*
Roundup-Ready	0.8	*
Total	3.6	1.9

*Less than 50,000 acres grown for seed production.

A little over one-fourth of the total harvested acreage of 13.2 million acres was planted in transgenics this year. The 3.6 million acres planted to transgenic cotton varieties reflected an increase in Bt acreage from 1996 as well as increases in acreages of BXN and Roundup-Ready cotton from the small acreages planted for seed production in 1996 (Table 2). Acreage of transgenics almost doubled over the 1996 production year.

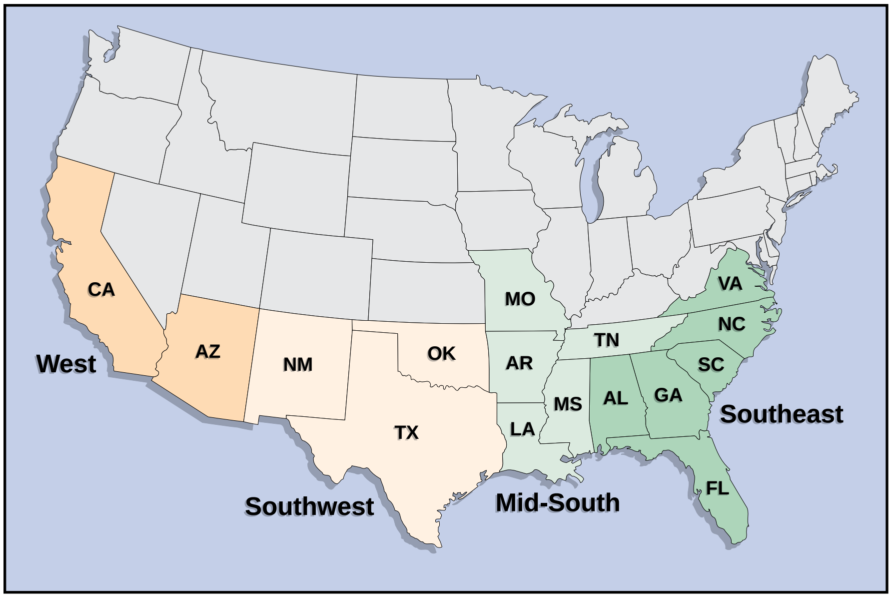

Figure 2. States of the U.S. Cotton Belt by region.

New Technologies

Traditionally, growers' changing production practices, coupled with a steady improvement in cotton varieties, are largely responsible for keeping them in the business of producing cotton. Some of the new technologies tried throughout the Cotton Belt this year included precision ag cultivators, crop monitoring and modeling programs, herbicide-resistant cotton varieties, ultra-narrow-row spacing, and gin process control. Applying a single new technology, or sometimes a combination of new technologies, enabled some growers to eliminate trips over the field and reduce costs. An example is use of herbicide-resistant varieties eliminating the need for traditional cultivation in some regions of the Cotton Belt (Figure 3).

AF Wrona

Figure 3. Mechanical cultivation of cotton as shown here is being replaced by new technologies.

Harvested Acreage

Harvested acreage decreased in all regions of the Cotton Belt except the Southwest where it increased so much that it surpassed both the 1996 and five-year averages (Table 3). Decreasing planted acreage appears to be an unsettling trend for both the West and Mid-South. Whereas bad weather largely accounted for the decrease in harvested acreage in the Southeast, timely rainfall and good weather caused the large increase in the Southwest where extensive acreages rely entirely on rain to supply water to cotton crops.

Changes in acreage by state are shown in Figure 4. Beltwide, 1997 acreage increased 1% over the five-year average. Strong growth in cotton's harvested acres is reflected in the Southeast (except for Alabama) and in New Mexico and Texas in the Southwest. California accounted for most of the drop in acreage in the West. Acreage in Louisiana and Mississippi decreased the most of the Mid-South states.

Table 3. Harvested acreages of U.S. upland cotton — '97, '96, and over the last five years (5 year).

REGION	Acreage, million acres '97	'96	5 Year
West	1.20	1.31	1.39
Southwest	5.58	4.37	5.07
Mid-South	3.39	3.89	4.18
Southeast	3.01	3.04	2.37
TOTAL	**13.18**	**12.61**	**13.01**

Increased water and insect-control costs are the reason many California growers are planting cotton acreage to higher cash crops such as grapes and almonds. Other western growers are looking into means of streamlining irrigation systems to increase their efficiency and thereby reduce water useage and cost.

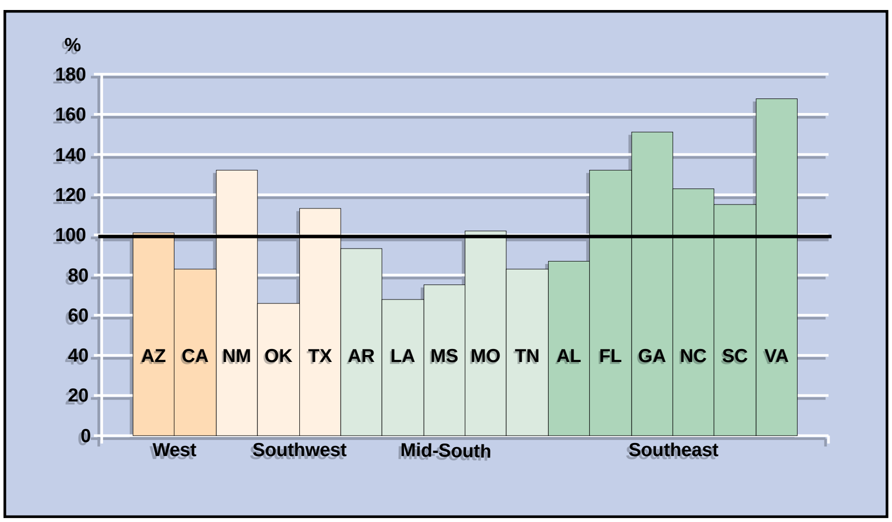

Figure 4. Comparison of 1997 with five-year-average acreages by state expressed as percent of 5-year-average -- bars above 100% reflect an increase, bars below indicate a decrease in harvested acreage.

The big jump in harvested acreage seen in the Southwest in 1997 is attributed to rainfed regions having received rain when it was needed to produce and maintain a crop. As in other regions of the Cotton Belt, Texas growers cannot count on good weather every year. However, unlike growers in some of the other regions, many of them have no source of irrigation water to use to supplement natural rainfall when it is insufficient.

Because of cold, wet weather at planting time, Mid-South growers had to plant late. Some chose to plant other crops with less risk associated for a short season and high insect pressure.

Growers in the Southeast were not able to harvest all of their planted acres. A cold, wet start was followed by a late-season drought that did in a crop that was struggling from day one. The stressful, cold weather served to exacerbate problems from an increasing nematode population, as stressed plants more readily succumb to pest pressure — whether from nematodes, pathogens, weeds or insects.

Yields

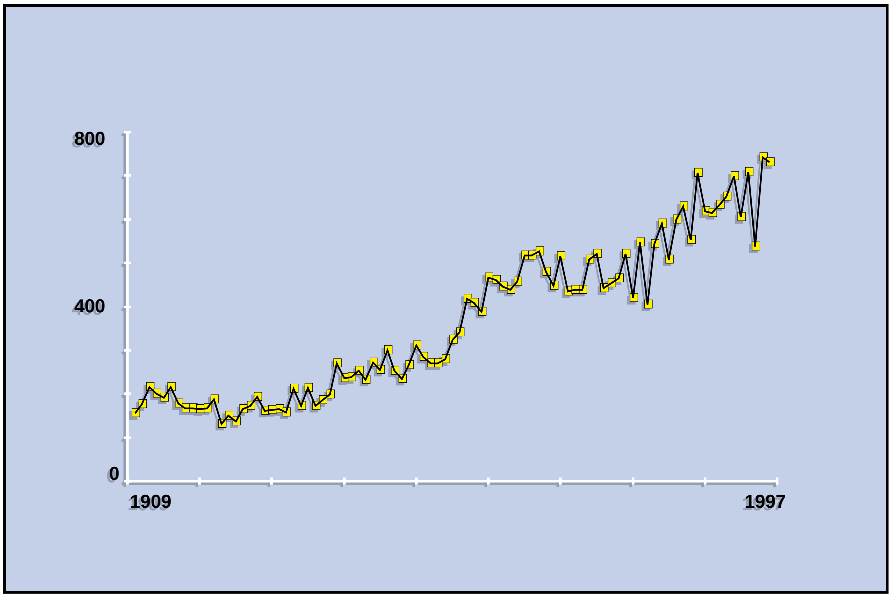

Figure 5. Average lint yields in pounds per acre for the U.S. Cotton Belt from 1909 through 1997.

Whereas the Beltwide average yield was less than 200 pounds per acre in 1909, yields have steadily climbed upward (Figure 5). In 1997, the average yield across the Cotton Belt was 731 pounds per acre. In past years, some have argued that yields have stopped increasing. A lot depends upon which two points you compare on the graph. Certainly there was not as much scatter for the first 50 years as there has been in the last two decades. Increases in yield occurred more rapidly over some time periods than others, but the overall trend is still upward.

Except for the Southeast, 1997 yields increased in all regions of the Cotton Belt over 1996 and 5-year averages (Table 4). Overall Beltwide yields decreased by 1% over 1996 yields and increased by 5% over the 5-year average yields.

Table 4. Yields of U.S. upland cotton — '97, '96, and 5-year averages.

Region	Yield, pounds per acre		
	'97	'96	5 Year
West	1202	1171	1166
Southwest	541	516	478
Mid-South	769	731	680
Southeast	639	720	653
Average	731	742	693

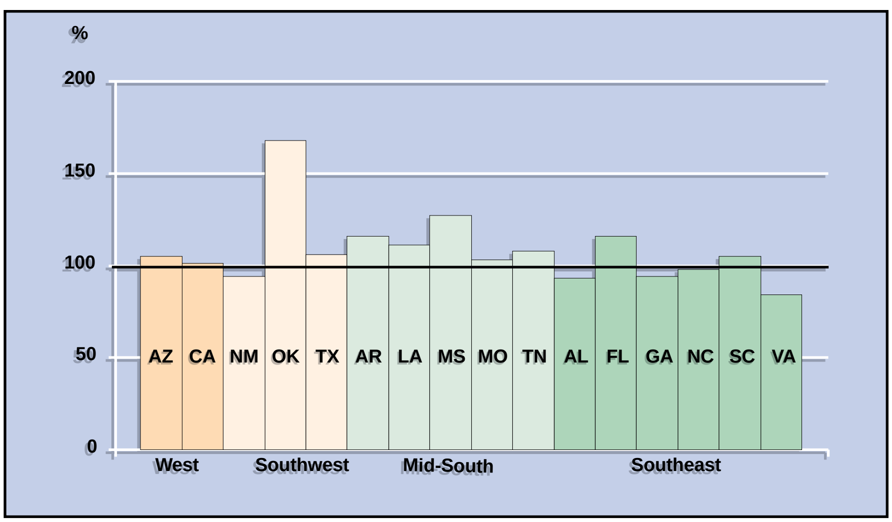

Figure 6. Comparison of 1997 with five-year-average yields by state -- bars above 100% reflect an increase, bars below indicate a decrease in yields.

Average 1997 yields for each state were compared with 5-year average yields in Figure 6. With the exception of three southeastern states and New Mexico, across the Cotton Belt 1997 yields were higher than the 5-year average yields. Oklahoma's 1997 yields stand out as they were 64% greater than the 5-year average. This increase in yield was counterbalanced by the marked drop in acreage seen in Oklahoma (Figure 4) and possibly reflected use of better land in the acres remaining in production.

Overall beltwide yields were 5% higher than the 5-year average yields. The yield drop seen in the Southeast was because of extremely bad weather over which growers had no control.

Number of Bales Produced

Production in million bales decreased 1% Beltwide from 1996, but increased over the five-year averages (Table 5). All regions except for the Southwest experienced a drop in number of bales produced. The increased number of bales produced in the Southwest reflected the increased acreage harvested in that region as a result of rainfed areas having received timely rains.

Table 5. Production of U.S. upland cotton — '97, '96, and over the last five years (5 year).

Region	Production, million bales		
	'97	'96	5 Year
West	3.02	3.17	3.30
Southwest	5.61	4.56	5.10
Mid-South	5.64	6.06	5.84
Southeast	4.00	4.61	3.62
Average	18.27	18.40	17.86

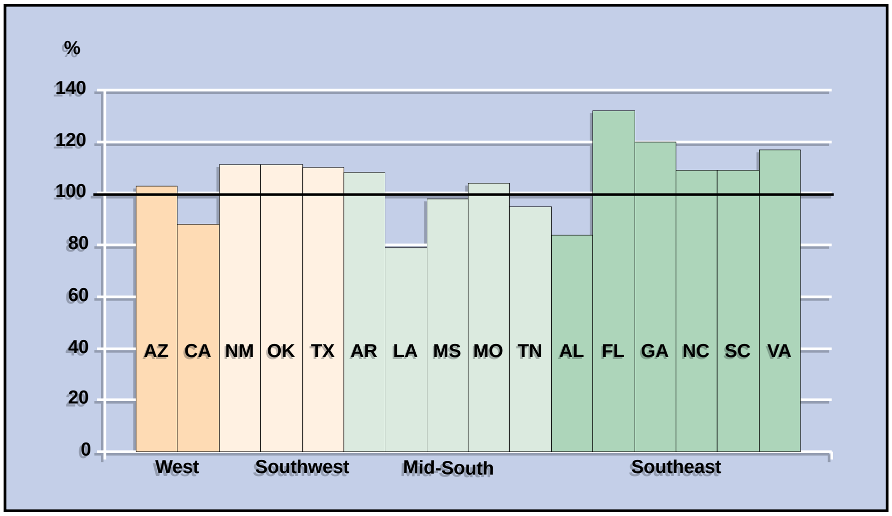

Figure 7. Comparison of 1997 with five-year average production by state -- bars above 100% reflect an increase, bars below indicate a decrease in number of bales produced.

Overall 1997 Beltwide production increased 2% over the five-year averages (Figure 7). States not showing an increase in production were California, Louisiana, Tennessee, and Alabama. All of those states experienced decreased acreage (Figure 4) and not decreased yields (Figure 6).

Overview

Figure 8. Percent change in acreage, production and yield obtained by comparing the 1997 crop with the five-year averages.

The 1997 crop is summarized in Figure 8 which compares it to the five-year average. Acreage and production increased in the Southwest and Southeast, but decreased in the West and Mid-South. Yields increased in all regions except the Southeast which experienced very poor weather. Yields did not increase enough to compensate for the loss in acreage in the West and Mid-South. Consequently, number of bales produced reflected acreage loss.

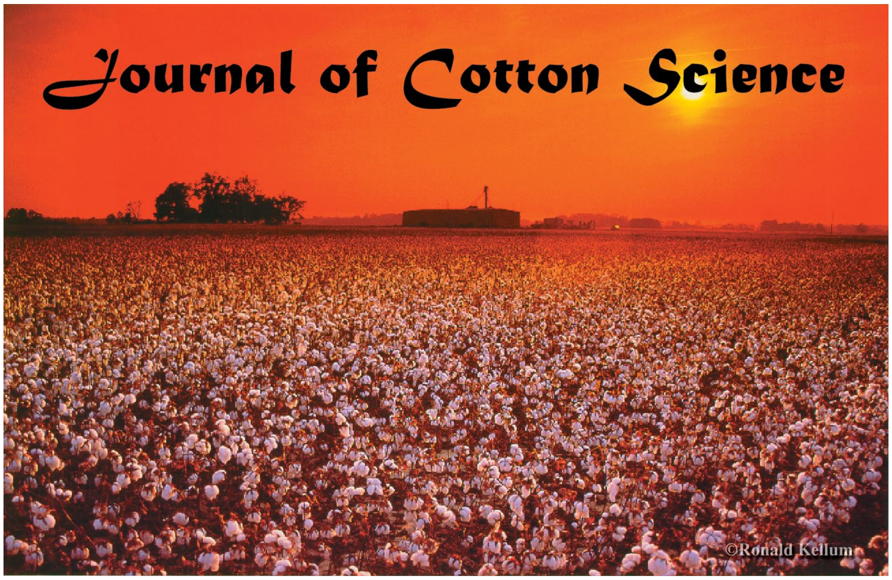

Figure 9. Start up screen, JCS.

As growers prepare for the 1998 crop, a new tool is emerging — namely the *Journal of Cotton Science* (Figure 9). Material published in this entirely electronic journal is peer-reviewed and edited to be certain it corresponds to the scientific method. In other words, anyone should be able to repeat experiments published in *JCS*. The benefit to our industry is in having documented science upon which to base new technologies. Articles are written for scientists, but must include an interpretive summary explaining the value and rationale of the research. Check it out on our National Cotton Council home page, "**www.cotton.org**."

Thirteen disciplines — Agronomy, Cotton & Other Organic Dusts, Cotton Improvement, Disease, Economics & Marketing, Ginning, Insect Research & Control, Physiology, Quality Measurements, Soils & Plant Nutrition, Textile Processing, and Weed Science — are represented. *JCS* is published four times a year. Each issue has one article featured "On the cover." For Volume 1, Issue 1, 1997 that article is by Saha and his coworkers from *JCS'* Cotton Improvement section (Figure 10).

Watch the *Journal of Cotton Science* for exciting developments and research findings pertaining to our cotton industry.

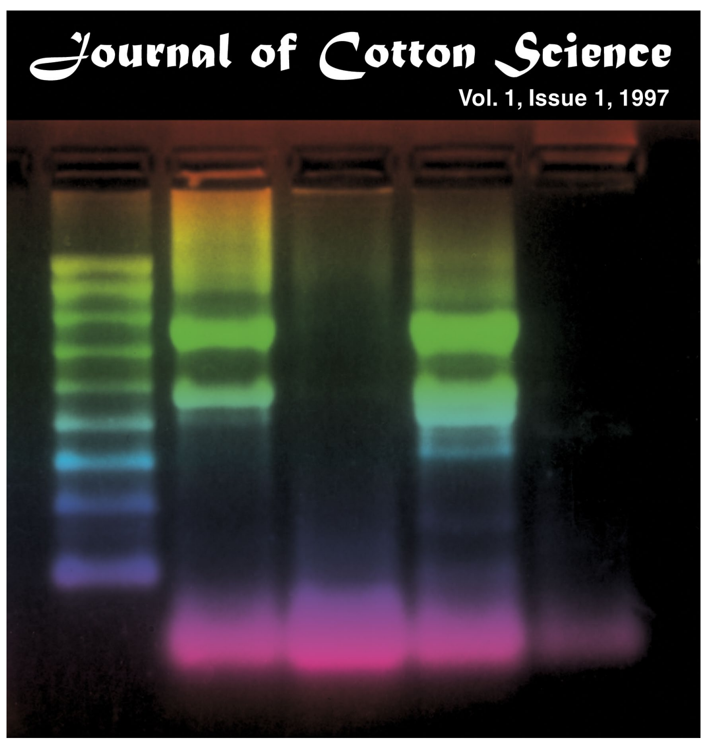

Figure 10. New methods of extracting DNA, RNA, and protein will aide cotton improvement efforts. Featured is a denaturing agarose gel of total RNA isolated from freeze-dried and nonfreeze-dried root and leaf tissues of cotton.

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