

## COTTON YIELD AND QUALITY AS AFFECTED BY TIME OF HARVEST

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### Introduction

The limited literature available indicates that timeliness of harvest is critical in obtaining maximum cotton yields. These data indicate that delaying harvesting until late in the harvest season results in yield reduction. Field losses could presumably occur from a combination of seed cotton deterioration and from loss of seed cotton because of wind and rain.

The objective of this study was to obtain information on the influence of time of harvest on cotton yield and quality.

### Experimental Procedure

Two similar field experiments were conducted during the 1969 growing season: one at the Agricultural Experiment Station, Marana and the other at the Cotton Research Center, Phoenix. Deltapine 16 was planted on 40-inch beds and managed as a commercial crop. Each experimental plot consisted of four rows 50 feet in length with the center two rows harvested for yield. Both experiments were replicated four times.

One set of replicated plots was used to monitor crop maturity with time. Young bolls that had reached a diameter of approximately 1/2 inch or greater were tagged and counted at approximately weekly intervals. The final date of boll tagging was September 2nd at Marana and September 10th at the Cotton Research Center. It was assumed that bolls developed after these dates would not mature. Mature bolls were harvested and counted, and these data were expressed as a percentage of the total number of green bolls counted.

When 48 and 64% of the bolls were open at Phoenix and Marana, respectively, harvesting began in other treatments. One treatment was repeatedly harvested by hand approximately on a weekly basis until after the maturity curve showed 100% of the bolls were open. Other plots were harvested by machine in turn as nearly as possible on a weekly basis until mid-December. When approximately 100% of the bolls were determined to be open from the maturity curve, plots that had been previously machine harvested were harvested for a second time. Treatments not harvested until after 100% open bolls were harvested only once. Each machine harvested plot was gleaned. In those plots that were to receive a second picking, only the cotton on the ground and that loose on the plant was gleaned. At the time of the final machine harvest, all of the mature cotton not picked was gleaned. This cotton was added to that picked by machine.

Fiber quality determinations were made by the University of Arizona

Fiber Laboratory, Tucson and the U.S.D.A. Classing Office, Phoenix. Only data from the U.S.D.A. Classing Office are reported here.

### Experimental Results

The yield data and boll maturity with time are shown in Table 1. Bolls began to open 2 or 3 weeks earlier at Phoenix than Marana. Bolls opened at a faster rate at Marana, however, and both locations had 100% open bolls by early November. At both locations, bolls that were set after the final date of boll tagging matured and values in excess of 100% open bolls are reported.

Maximum seed cotton yields were obtained when the plots were machine harvested early in October with a second picking early in November. Delaying harvesting with only one machine picking late in November resulted in approximately a 10% reduction in yield even though all mature seed cotton not harvested by machine was gleaned after picking. Beginning late in November the effect of the top-crop can be seen and increased yields are noted. These late-season yields, however, generally were not as great as yields that were obtained by harvesting earlier; once early in October and once early in November. From these data, it would appear that in the absence of a top-crop, delaying harvest until after late November can result in a 10 to 15% reduction in seed cotton yields.

Fiber length and fiber fineness data are shown in Table 2. In general there was no consistent relationship between date of harvest and fiber length. Harvesting commenced earlier at Phoenix than Marana, and these early harvests in Phoenix were associated with reduced micronaire readings. This could indicate that early set cotton fibers do not develop secondary wall thickening as completely as cotton that is set slightly later. At both locations highest micronaire readings occurred early in October with a reduction at later dates. Again, this reduction late in the season may be associated with less secondary wall thickening of fiber cells.

Table 1

Percentage open bolls and pounds of seed cotton per acre at different dates.

Date	% open bolls	Yield at 1st harvest	% of total	Total field yield
<u>Marana</u>				
Sept. 3	7	---	--	---
9	15	---	--	---
16	25	---	--	---
25	43	---	--	---
Oct. 7	64	2,303	45	4,981
14	76	2,469	56	4,379
21	89	3,751	78	4,815
28	95	4,038	85	4,732
Nov. 4	100	4,402	100	4,402
12	101	---	--	---
25	105	4,574	100	4,574
Dec. 2	107	4,919	100	4,919
9	---	4,445	100	4,445
<u>Phoenix</u>				
Aug. 21	10			
27	19			
Sept. 4	36			
10	48	2,159	55	3,942
23	66	2,688	61	4,438
Oct. 2	78	3,390	74	4,597
9	84	3,409	75	4,555
16	92	3,521	81	4,336
23	95	3,764	86	4,411
30	98	4,050	100	4,050
Nov. 6	100	4,050	100	4,050
20	102	3,856	100	3,856
28	---	4,377	100	4,377
Dec. 11	---	4,273	100	4,273

Table 2

Fiber length (1/32 inch increments) and fiber fineness (micronaire) of cotton at different dates of harvest.

Date	Hand harvest <sup>1</sup>		Machine harvest <sup>2</sup>	
	length	fineness	length	fineness
<u>Marana</u>				
Oct. 7	35	4.6	34	4.6
14	35	4.2	36	4.4
21	38	4.1	37	4.5
28	34	3.8	35	4.4
Nov. 4	38	3.8	34	4.4
25	--	---	34	4.2
Dec. 2	--	---	36	3.8
9	--	---	36	4.2
<u>Phoenix</u>				
Sept. 10	34	4.1	34	4.2
23	34	4.6	34	4.2
Oct. 2	34	5.0	34	4.3
9	--	---	34	4.7
16	36	4.5	34	4.6
23	37	4.6	34	4.5
30	36	4.5	34	4.4
Nov. 6	--	---	34	4.4
20	--	---	34	4.4
28	--	---	34	4.4

<sup>1</sup> Data were obtained from repeating picking of the same plots.

<sup>2</sup> Each date of harvest was taken from a different plot.