Short Staple Breeding, Genetics and Variety Tests

Variety/Date of Planting Test

E. J. Pegelow and W. D. Fisher, Plant Sciences Department

SUMMARY

Two upland cotton varieties, Stoneville 506 and Deltapine 20, were planted on six dates at the Maricopa Agricultural Center and observed for emergence, flowering, boll maturation, and yield. Work is in progress to correlate the accumulation of heat units with the timing of developmental events in Arizona-grown cotton.

MATERIALS AND METHODS

The two varieties were planted in four-row strips, replicated four times, on 4/10, 4/24, 5/8, 5/22, 6/6, and 6/18. Observation plots within each strip were used for emergence counts, daily flower counts, and weekly sequential harvest of open bolls. An automated weather station in the field continuously collected weather data throughout the growing season. This type of temperature data can be used to derive absolute heat units with any combination of low/high temperature thresholds.

RESULTS

Machine-picked lint yields for the various planting date/variety combinations are shown in Table 1. Both varieties performed well in this test, with no particular problems in stand establishment, fertility, or insect pressure in any of the plantings.

The timing of lint production in Stoneville 506 can be seen in Table 2, which summarizes the results of weekly hand-harvesting of open bolls. The days after planting required to reach 50% of the maximum observed lint production were 139, 129, 125, 131, and 160 for plantings 1-5, respectively (the sixth planting never reached the 50% level).

Work is currently in progress to develop a model based on heat unit accumulation. It will allow prediction of the timing of key developmental stages in cotton planted across a range of dates. It is hoped that the model will be ready for testing during the 1987 growing season.

Table 1. Machine-picked yields of the two varieties planted on different dates:

Lint (Pounds/Acre)

Planting Date	Stoneville 506	Deltapine 20
4/10	1931	1953
4/24	1634	1574
5/8	1373	1344
5/22	1476	1601
6/6	1301	1362
6/18	833	890

Table 2. Stoneville 506 cumulative lint production, expressed as a percent of the maximum observed, in weekly sequential hand- pickings.

	Planting Date					
Week of Pick	4/10	4/24	5/8	5/22	6/6	6/18
8/11	6.6%	0.9%				
8/18	21.2%	6.7%				
8/25	43.5%	27.0%	6.8%			
9/1	65.8%	55.1%	26.0%			
9/8	79.9%	69.9%	45.1%	3.1%		
9/15	90.7%	85.8%	61.6%	21.3%		
9/22	94.7%	90.5%	66.5%	35.3%	1.0%	
9/29	96.3%	92.1%	72.2%	48.4%	2.6%	
10/6	97.4%	92.7%	75.2%	64.2%	6.4%	
10/13	98.0%	93.1%	76.4%	69.5%	15.4%	0.4%
10/20	98.4%	93.4%	76.9%	72.9%	22.2%	1.4%
10/27	98.9%	93.6%	77.0%	76.0%	29.4%	5.2%
11/3	100.0%	93.6%	77.2%	78.1%	34.9%	9.8%
11/10					41.0%	14.1%
11/17					60.7%	30.3%
11/24					65.6%	40.6%
12/1					66.7%	44.2%