

# Lint Yield of Several Cotton Varieties Planted on Five Dates at Three Locations in Arizona in 1987

*D.L. Kittock, Jeff Silvertooth, C. Hofmann, J. Malcuit, and P. Else*

## ABSTRACT

*Wide variations existed in the performance of cotton varieties over the five planting dates among three locations over three years. However, on the average, DP 77 performed best when planted between 27 March and 22 April at Maricopa and Marana. DP 90 was best for April and early May plantings at Safford. Stoneville 506 and DP 50 were among the best for May plantings. DP 20 Stoneville 112, and DP 50 averaged best for early June plantings, except Germain 510 was superior at Safford.*

## INTRODUCTION

Many cotton yield tests are planted in Arizona each year, but few compare cotton varieties at several planting dates. In particular, more information has been needed on cotton varieties best suited for replanting or for double cropping after small grains. We have established tests at three locations in each of the last three years to compare cotton varieties at five planting dates.

## METHODS

The experimental format in 1987 was similar to 1985 and 1986. Eleven upland and one Pima cotton varieties were planted at the Maricopa and Marana Agricultural Centers. Nine upland and one Pima cotton varieties were planted at the Safford Agricultural Center. Some varieties have been changed each year.

There were 5 planting dates and 4 replications in each test. Plots were 4 rows wide, with the center 2 rows harvested for lint yield. Plot lengths were 39, 40, and 36 feet at Maricopa, Marana and Safford, respectively.

Germain 510 and Pima S-6 were grown at Maricopa and Marana in 1987 for the first time; Pima S-6 was inadvertently left out of the second planting. There were two harvests at each location, but only total lint yields are presented.

## RESULTS

Lint yields for the three tests in 1987 and three yearly averages are given in Tables 1, 2, and 3. To compare varieties over years, lint yields were converted to percentage of the best variety for each planting date in each test location each year. These percentages were then averaged over the three years, or in some cases, over two or one years. Varieties have been entered into the tables in order of mean yield percentages, rather than in order of 1987 lint yields.

In general terms, tall varieties performed best in early plantings and intermediate or short varieties performed best in late plantings. Tall varieties decreased in yield with later plantings more rapidly than intermediate or short varieties. Pima S-6 yields decreased most rapidly with delayed planting, followed in

order by DP 77, DP 61, and DP90 (all tall varieties). Yields of DP 20 and Centennial were least affected by delayed plantings.

Variety evaluations for different planting dates at Maricopa remain erratic. Poor stands and probably varietal differences in heat tolerance contributed to the inconsistent results. The yield data, as we have it, are presented in Table 1. Our guess is that over a long-term, DP 77 will be the best upland variety for late March to mid-April plantings. From mid-April to mid-May, DP 50 probably will be best. The high yield of Pima S-6 in the first planting represents only 1987 data; stands were poor; the yields of some varieties were not reported for that reason. Therefore, great care should be exercised when reporting that Pima S-6 out-yielded all upland cotton varieties on the 27 March planting.

At Marana, variety rankings have been fairly consistent over years. DP 77 has had top yield for April plantings, followed by DP 90. Stoneville 506 and DP 50 were best for May plantings; DP 20 and Centennial were best for 10 June plantings. The relatively low yield of Germain 510 at both Maricopa and Marana suggests the variety has the low heat tolerance that would be expected of an Acala type cotton.

DP 90 was consistently the best upland cotton variety for Safford for April plantings and averaged best for early May plantings. Apparently the growing season at Safford is too short for maximum production for DP 77. Germain 510 (one years data) was best for late May and early June plantings. DP 50 and Stoneville 112 also showed promise for late plantings.

In general terms, these tests were irrigated and fertilized in a manner suited for DP 90 at the second planting. Defoliation and harvests were late. Other management schemes could have substantially improved the relative performance of some varieties. As an example, pushing (frequent irrigation) Centennial reportedly improves its yield potential. This would be expected; the variety ordinarily is too short for maximum yield in 40) inch rows. DP 20 consistently had poorer stands than other varieties, which undoubtedly reduced its yield. DP 90 consistently had the lowest second pick, and therefore, would have had relatively better lint yield with the 1 November harvest. Pima S-6, on the other hand, had the greatest second pick.

Table 1. Lint yield, height, stand and % stand for 12 cotton varieties planted at 5 dates and harvested on 20 November at Maricopa, Arizona in 1987.

<u>27 March Planting</u>			<u>17 April Planting</u>		
<u>Variety</u>	<u>Ibs lint/acre<sup>1</sup></u>	<u>% of best<sup>2</sup></u>	<u>Variety</u>	<u>Ibs lint/acre</u>	<u>% of best</u>
Pima S-6	1492 a <sup>3</sup>	100	DP 77	1612 a	99.4
Stv 112	---	97.8	DP 90	1633 a	96.1
DP 77	---	97.7	Stv 506	1554 a	95.2
Stv 825	---	97.1	DP 50	1572 a	92.5
DP 50	1303 b	91.4	Stv 825	1375 b	88.3
DP 61	1336 ab	90.0	DP 61	1283 bc	87.8
DP 90	1339 ab	89.7	Stv 112	1274 bc	87.7
DP 20	---	88.2	Germain 510	1345 bc	82.3
Germain 510	1293 bc	86.7	DP 20	1339 bc	82.0
Stv 506	1123 c	84.9	DP 41	1169 c	79.8
Centennial	1184 bc	80.3	Centennial	1264 bc	78.7
DP 41	831 d	79.9	Pima S-6	---	---
Mean	1267			1430	
Plants/acre	13,000			27,000	
Plant height(in)	38			39	
% stand	20.0			40.0	
<u>30 April Planting</u>			<u>15 May Planting</u>		
<u>Variety</u>	<u>Ibs lint/acre</u>	<u>% of best</u>	<u>Variety</u>	<u>Ibs lint/acre</u>	<u>% of best</u>
DP 61	1540 a	95.9	DP 90	1489 a	97.0
DP 50	1399 ab	95.9	DP 50	1390 ab	96.7
DP 77	1371 ab	91.0	Stv 506	1425 ab	94.6
DP 90	1425 ab	90.6	Stv 825	1307 ab	91.1
Stv 825	1398 ab	89.9	Stv 112	1255 b	90.7
Stv 506	1268 bc	88.3	DP 61	1309 ab	87.4
Stv 112	1071 d	87.3	DP 41	1282 b	87.4
DP 41	1052 d	84.9	DP 20	1324 ab	87.4
DP 20	1129 cd	80.6	DP 77	1262 b	84.9
Centennial	1175 cd	80.1	Germain 510	1040 c	69.8
Pima S-6	1133 cd	73.6	Centennial	962 c	64.6
Germain 510	1000 d	64.9	Pima S-6	916 c	61.6
Mean	1248			1244	
Plants/acre	17,000			29,000	
Plant height(in)	37			35	
% stand	25.5			42.7	

Table 1 (Cont'd)

<u>4 June planting</u>			<u>Plants/acre, plant height, and % stand (Means of 5 planting dates)</u>			
<u>Variety</u>	<u>Lbs lint/acre</u>	<u>% of best</u>	<u>Variety</u>	<u>Plants/acre</u>	<u>Plant height(in)</u>	<u>% stand</u>
DP 20	P	100	DP 20	13,000 d	36 cde	19.0 d
Stv 825	O	97.1	DP 41	15,000 cd	30 f	21.9 cd
Stv 112	O	96.2	DP 50	20,000 b	35 de	29.1 b
DP 50	R	93.7	DP 61	20,000 b	34 de	29.5 b
Stv 506		89.6	DP 77	15,000 cd	40 b	22.8 cd
DP 41	S	87.2	DP 90	25,000 a	45 a	37.5 a
DP 90	T	83.4	Stv 112	14,000 cd	34 de	21.2 cd
DP 61	A	81.8	Stv 506	22,000 b	34 de	32.3 b
DP 77	N	72.0	Stv 825	15,000 c	36 cd	23.1 c
Germain 510	D	—	Germain 510	24,000 a	33 ef	36.5 a
Centennial		—	Centennial	19,000 b	30 f	28.5 b
Pima S-6		—	Pima S-6	14,000 cd	38 bc	21.3 cd
Mean	816					
Plants/acre	5,000					
Plant height(in)	28					
% stand	7.6					

<sup>1</sup> Only 1987 lint yields

<sup>2</sup> Lint yield as % of best variety averaged over 3 years, or less if less available.

<sup>3</sup> Lint yields within a column followed by the same letter are not significantly different at the 0.05 confidence level according to Duncan's Multiple Range Test

Table 2. Lint yield, height, stand, and % stand for 12 cotton varieties planted at 5 dates and harvested on 8 December at Marana, Arizona in 1987.

<u>1 April planting</u>			<u>21 April planting</u>		
<u>Variety</u>	<u>Lbs lint/acre<sup>1</sup></u>	<u>% of best<sup>2</sup></u>	<u>Variety</u>	<u>Lbs lint/acre</u>	<u>% of best</u>
DP 77	2090 a <sup>3</sup>	99.2	DP 77	1652 ab	97.9
DP 90	1682 f	89.4	DP 90	1740 a	97.4
DP 41	1811 cde	86.5	DP 20	1683 ab	95.0
DP 61	2043 ab	84.4	DP 50	1761 a	93.4
Germain 510	1693 ef	81.0	DP 41	1754 a	93.0
Stv 506	1751 def	80.7	DP 61	1685 ab	91.8
Pima S-6	1676 f	80.2	Stv 506	1719 ab	90.8
DP 20	1631 f	78.0	Stv 112	1602 b	89.3
Stv 825	1932 bc	77.3	Stv 825	1705 ab	85.7
DP 50	1866 cd	74.6	Germain 510	1476 bc	83.8
Stv 112	1642 f	73.8	Centennial	1426 c	77.3
Centennial	1478 g	63.1	Pima S-6	-----	-----
Mean	1778			1662	
Plants/acre	33,000			33,000	
Plant height(in)	31			33	
% stand	49.7			49.2	
<u>5 May planting</u>			<u>26 May planting</u>		
<u>Variety</u>	<u>Lbs lint/acre</u>	<u>% of best</u>	<u>Variety</u>	<u>Lbs lint/acre</u>	<u>% of best</u>
Stv 506	1824 a	97.8	Stv 506	1689 ab	98.1
DP 50	1743 ab	97.5	DP 50	1755 a	96.5
DP 41	1761 ab	95.4	Stv 112	1559 c	94.3
DP 61	1792 ab	93.1	DP 20	1574 bc	90.3
Germain 510	1678 bc	92.0	Germain 510	1510 cd	86.0
Stv 825	1814 a	89.7	DP 90	1414 d	85.4
Stv 112	1539 d	89.7	DP 41	1538 cd	83.1
DP 90	1594 cd	89.6	Centennial	1445 cd	83.1
DP 20	1536 d	87.6	Stv 825	1576 bc	82.5
DP 77	1493 d	85.6	DP 61	1463 cd	82.0
Centennial	1512 d	80.7	DP 77	1245 e	74.5
Pima S-6	1044 e	57.2	Pima S-6	797 f	45.4
Mean	1611			1464	
Plants/acre	34,000			37,000	
Plant height(in)	36			41	
% stand	51.4			54.8	

Table 2 (Cont'd)

<u>9 June Planting</u>			<u>Plants/acre, plant height and % stand (mean of 5 planting dates)</u>			
<u>Variety</u>	<u>Ibs lint/acre</u>	<u>% of best</u>	<u>Variety</u>	<u>Plants/acre</u>	<u>Plant height(in)</u>	<u>% stand</u>
DP 20	1341 a	100	DP 20	19,000 g	33 d	28.0 g
Centennial	1190 bc	94.2	DP 41	33,000 d	37 c	48.7 d
Germain 510	1260 ab	93.9	DP 50	34,000 cd	33 d	50.5 cd
DP 50	1331 a	91.2	DP 61	35,000 bc	37 c	52.2 bc
Stv 506	1234 ab	86.9	DP 77	32,000 de	45 a	47.4 de
Stv 112	1151 bcd	86.8	DP 90	38,000 a	41 b	56.1 a
DP 61	1097 cde	82.4	Stv 112	30,000 ef	32 d	44.9 ef
DP 90	1213 abc	82.4	Stv 506	37,000 ab	32 d	54.7 ab
DP 41	1024 e	81.9	Stv 825	28,000 f	37 c	42.2 f
Stv 825	1048 de	81.9	Germain 510	36,000 ab	33 d	53.9 ab
DP 77	895 f	63.2	Centennial	30,000 ef	29 e	44.5 ef
Pima S-6	391 g	29.1	Pima S-6	32,000 de	40 b	47.3 de
Mean	1095					
Plants/acre	22,000					
Plant height(in)	38					
% stand	33.3					

<sup>1</sup> Only 1987 lint yields

<sup>2</sup> Lint yield as % of best variety averaged over 3 years, or less if available.

<sup>3</sup> Lint yields within a column followed by the same letter are not significantly different at the 0.05 confidence level according to Duncan's Multiple Range Test

Table 3. Lint yield, height, stand, and % stand for 10 cotton varieties planted at 5 dates and harvested on 2 December at Safford, Arizona in 1987.

<u>7 April Planting</u>			<u>23 April Planting</u>		
<u>Variety</u>	<u>Lbs lint/acre<sup>1</sup></u>	<u>% of best<sup>2</sup></u>	<u>Variety</u>	<u>Lbs lint/acre</u>	<u>% of best</u>
DP 90	1282 a3	100	DP 90	1349 a	100
DP 77	1179 b	87.3	Germain 510	1094 c	81.1
Germain 510	1086 cd	84.7	DP 77	1232 b	80.3
Germain 365	1155 bc	77.9	Stv 506	1059 c	78.5
Stv 506	997 ef	77.7	DP 50	979 de	75.0
Pima S-6	993 ef	75.3	Germain 365	1103 c	74.4
DP 50	1055 de	73.7	DP 20	966 e	73.3
DP 20	942 f	69.7	Pima S-6	921 e	71.4
Stv 112	1000 ef	65.6	Stv 112	1049 cd	66.3
Centennial	681 g	49.8	Centennial	843 f	54.6
Mean	1036			1062	
Plants/acre	27,000			37,000	
Plant height(in)	27			25	
% stand	37.1			50.7	
<u>7 May Planting</u>			<u>22 May Planting</u>		
<u>Variety</u>	<u>Lbs lint/acre</u>	<u>% of best</u>	<u>Variety</u>	<u>Lbs lint/acre</u>	<u>% of best</u>
Stv 112	1241 a	92.7	Germain 510	998 a	100
DP 50	1227 ab	90.9	DP 50	968 ab	95.6
DP 90	1163 bc	95.2	Germain 365	894 bc	91.2
Stv 506	1150 c	92.6	Stv 506	897 bc	89.8
Germain 365	1145 c	92.8	DP 90	817 d	89.7
Germain 510	1119 d	90.2	Stv 112	857 cd	88.5
DP 20	990 d	81.3	DP 20	814 d	86.9
DP 77	908 e	80.0	DP 77	646 e	74.7
Pima S-6	854 e	76.4	Centennial	686 e	63.8
Centennial	728 f	60.0	Pima S-6	499 f	60.1
Mean	1054			808	
Plants/acre	38,000			35,000	
Plant height(in)	29			36	
% stand	52.6			47.6	

Table 3 (Cont'd)

<u>10 June Planting</u>			<u>Plants/acre, plant height, and % stand (mean of 5 planting dates)</u>			
<u>Variety</u>	<u>Lbs lint/acre</u>	<u>% of best</u>	<u>Variety</u>	<u>Plants/acre</u>	<u>Plant height(in)</u>	<u>% stand</u>
Germain 510	708 a	100	DP 20	22,000 e	31 e	29.8 e
Stv 112	617 b	93.6	DP 50	36,000 bc	27 d	49.7 bc
DP 50	644 ab	93.5	DP 77	33,000 cd	37 ab	45.9 cd
Stv 506	644 ab	91.0	DP 90	40,000 a	38 a	55.0 a
DP 20	516 c	82.8	Stv 112	31,000 d	27 d	42.1 d
DP 90	525 c	81.5	Stv 506	39,000 ab	27 d	53.0 ab
Germain 365	492 c	75.7	Germain 510	35,000 bc	30 c	48.7 bc
Centennial	602 b	67.2	Centennial	31,000 d	24 e	42.2 d
DP 77	275 d	46.1	Pima S-6	37,000 bc	35 b	50.3 bc
Pima S-6	163 e	24.7	Germain 365	37,000 b	37 ab	50.7 b
Mean	518					
Plants/acre	33,000					
Plant height(in)	38					
% stand	45.7					

<sup>1</sup> Only 1987 lint yields

<sup>2</sup> Lint yield as % of best variety averaged over 3 years, or less if less available.

<sup>3</sup> Lint yields within a column followed by the same letter are not significantly different at the 0.05 confidence level according to Duncan's Multiple Range Test