

# Row Spacing Studies, Safford Agricultural Center, 1994 and 1995

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## Abstract

*Four varieties (or variety types) were tested over three row spacings in the two years reported in this study. Two barbadense varieties, S6 and S7 or OA 312, and two hirsutum varieties, DP 90 and a NM acala were planted in 30 inch, 36 inch and 40 inch row spacing environments. Optimal row spacing varied by variety over the two years but averaged over the two years, the 36 inch spacing provided the highest yields for all varieties except for the NM acalas.*

## Introduction

Row spacing studies have been implemented at the Safford Agricultural Center over a period of several years. The initial interest was caused by the success with narrow row spacings on cotton yields in California. The first few years of the study had quite variable results, many of which were traced back to the fact that a tractor set on 72 inch spacing can cause considerable yield reduction due to compaction in plots set on 30 inch spacings. The past few years a tractor has been set up and dedicated for use in the 30 inch plots, thus reducing much of the variability. The studies in 1994 and 1995 included four cotton varieties, DP 90, 1517-95/1517-91, Pima S6 and Pima S7/OA 312 to find the optimum row spacing for each class of cultivar.

## Materials and Methods

The varieties being tested were planted in a split plot design with two rows of each variety planted in an eight row block with common row spacings. The treatments were replicated four times. The crop history is included below to define the cultural practices.

### Crop history - 1994

Soil type: Pima clay loam variant

Previous crop: Cotton

Planting date: 7 April 1994                      Rate: 25 lbs/ac

Herbicide: Triflurilin preplant incorporated

Fertilizer: 100 lbs/ac urea side dressed 17 June

Irrigation: Watered up plus 7 irrigations (40.6 ac in + 2.7" rain)                      Last date: 1 September

Harvest: 1st pick: 2 November                      2nd pick: 29 November

### Crop history - 1995

Soil type: Grabe clay loam/ Pima clay loam variant

Previous crop: Barley

Planting date: 2 May, 1995                      Rate: 25 lbs/ac

Herbicide: Caparol applied at lay-by

Fertilizer: 100 lbs/ac urea side dressed 7 June, 10 July

Irrigation: Watered up plus 6 irrigations (30 ac in + 4.6" rain)                      Last date: 17 August

Harvest: 1st pick: 13 November                      2nd pick: 29 November

Plots were harvested with a modified two-row cotton picker which collected cotton from each plot in a large bag. Weights were then obtained by weighing the bags on a hanging scale.

## Results and Discussion

Because the experiment was a split plot design, the results were analysed in a 2-way comparison looking at the effects of variety over row spacing and then at row spacing over variety. These results are reported in Tables 1 and 2 for years 1994 and 1995, respectively. In both years, DP 90 was the highest yielding over all row spacings followed by the 1517 variety, the short seasoned Pima and Pima S6. Pima S6 being the lower yielding than the short seasoned Pima is explained by poor seed quality in 1994 and unfavorable climatic conditions in 1995. Looking at row spacings across all varieties gave varying results over the two years. The 30 inch rows had the highest yields in 1994 and the 36 inch rows had the highest yields in 1995.

It was found more instructive to look at each variety separately so the effects would not be masked by other variables. Table 3 shows the results of different row spacings on DP 90. The 36 inch row spacing was optimal for yield production over both years. Table 4 shows the results of different row spacings on the two 1517 varieties. In 1994 with 1517-95 the 30 inch row spacing had the highest yield, even though not significantly, and that treatment also had the largest percent first pick. In 1995 with 1517-91, the 36 and 40 inch spacings seemed to have a slight edge over the 30 inch spacing. So, on average there were no differences between row spacings for these NM acalas. The data from Pima S6 is found in Table 5. The plants per acre column show the effect of poor seed germination on the trial in 1994 with the 40 inch spacing being very deficient in plants. This has to have reduced the yield compared to the other two treatments. An interesting thing was seen in 1995 with a trend toward higher yields with narrowing row spacings. This is diametrically opposed to what we had seen in the studies prior to 1994. No statistically significant differences were seen in yield so this phenomenon will be followed in subsequent trials. The shorter seasoned Pima varieties are reported in Table 6. Nothing shows up as statistically significant, but the average over the two years of the trial indicates a preference for the 36 inch row spacing.

Figure 1 shows graphically the results of Tables 3 - 6. Differences in yields between row spacings are minimal, but DP 90 and the short seasoned Pimas give an indication of preference for the 36 inch spacing. Pima S6 shows a preference for the 36 and 30 inch row spacings. The NM acalas had a bimodal response, which indicates that there were no differences between treatments.

This study will continued another year using 1517-95 and OA 312 along with DP 90 and Pima S6. The former two varieties are gaining popularity among growers in the high deserts of the southwest.

**Table 1. Seedcotton yield and other agronomic factor as affected by variety and row spacing on the Safford Agricultural Center, 1994.**

Treatment	SC Yld	% 1st Pk	PI Ht	Pl/ac	Nodes	HNR
<b>Variety effects across row spacing</b>						
DP 90	3757 a	98.3 a	34.0 ab	28423 a	21.8 ab	1.58 a
1517-95	3056 b	96.9 a	35.3 a	20718 b	22.2 a	1.60 a
Pima S6	1505 d	92.7 b	33.9 ab	10133 d	20.9 ab	1.63 a
Pima S7	1968 c	94.3 b	31.8 b	14620 c	20.1 b	1.61 a
<b>Row spacing effects across varieties</b>						
30"	2703 a	96.8 a	33.8 ab	20929 a	20.8 a	1.64 a
36"	2614 a	95.2 a	32.8 b	19312 a	21.5 a	1.52 a
40"	2395 a	94.7 a	34.7 a	15179 b	21.5 a	1.65 a
Avg	2570.8	95.56	33.75	18473.6	21.27	1.6
LSD 05	397	2.24	2.16	2942.4	1.65	0.15
CV %	18.6	2.82	7.69	19.18	9.33	11.49

**Table 2. Seedcotton yield and other agronomic factor as affected by variety and row spacing on the Safford Agricultural Center, 1995.**

Treatment	SC Yld	PI Ht	Pl/ac
<b>Variety effects across row spacing</b>			
DP 90	3236 a	34.6 a	36451 a
1517-91	3016 a	33.7 a	36603 a
Pima S6	1537 c	36.9 a	37359 a
OA 312	2037 b	36.4 a	34788 a
<b>Row spacing effects across varieties</b>			
30"	2328 a	34.1 a	36867 a
36"	2641 a	36.9 a	36754 a
40"	2401 a	35.2 a	35279 a
Avg	2456.4	35.4	36300
LSD 05	213.4	2.68	8044.2
CV %	12.1	10.5	30.8

**Table 3. Seedcotton yield and other agronomic factor for DP 90 as affected by row spacing on the Safford Agricultural Center, 1994-5.**

Treatments	SC Yld	% 1st Pk	PlHt	Pl/Ac	Nodes	HNR
1994						
30"	3815 a	99.1 a	35.8 a	32670 a	21.9 a	1.65 a
36"	3978 a	97.1 b	31.8 a	27906 a	22.3 a	1.45 a
40"	3477 a	98.8 a	34.5 a	24694 a	21.3 a	1.64 a
AVG	3756.7	98.34	34	28423.3	21.79	1.58
LSD 05	1142.4	1.76	5.24	12127	4.12	0.5
CV %	17.6	1.04	8.9	24.7	11.32	18.23
1995						
30"	2913 c		31.8 a	39930 a		
36"	3576 a		36.0 a	35930 a		
40"	3219 b		36.0 a	34031 a		
AVG	3235.8		34.6	36451.3		
LSD 05	291.8		7.36	16854.6		
CV %	5.2		12.3	26.7		
Average over 1994 and 1995						
30"	3364		33.8	36300		
36"	3777		33.9	31918		
40"	3348		35.3	29363		

**Table 4. Seedcotton yield and other agronomic factor for 1517-9x as affected by row spacing on the Safford Agricultural Center, 1994-5.**

Treatments	SC Yld	% 1st Pk	PlHt	Pl/Ac	Nodes	HNR
1517-95 - 1994						
30"	3327 a	98.3 a	34.1 a	20555 a	21.1 a	1.63 a
36"	2850 a	95.5 b	35.0 a	23028 a	23.5 a	1.49 a
40"	2984 a	96.9 ab	36.6 a	18572 a	22.0 a	1.69 a
AVG	3053.4	96.91	35.25	20718.2	22.21	1.6
LSD 05	683.8	2.46	5.28	4741.5	2.41	0.33
CV %	12.9	1.46	8.66	13.22	6.27	11.76
1517-91 - 1995						
30"	2813 a		31.5 a	29494 a		
36"	3113 a		36.0 a	38115 a		
40"	3122 a		33.5 a	42199 a		
AVG	3016		33.7	36602.5		
LSD 05	379.4		6.84	12418.9		
CV %	7.3		11.8	19.6		
Average over 1994 and 1995						
30"	3070		32.8	25025		
36"	2982		35.5	30572		
40"	3053		35.1	30386		

**Table 5. Seedcotton yield and other agronomic factor for Pima S6 as affected by row spacing on the Safford Agricultural Center, 1994-5.**

Treatments	SC Yld	% 1st Pk	PIHt	PI/Ac	Nodes	HNR
1994						
30"	1549 a	94.0 a	33.0 a	14021 a	20.1 a	1.65 a
36"	1732 a	94.5 a	34.6 a	10663 ab	21.0 a	1.65 a
40"	1234 a	89.5 a	34.1 a	5714 b	21.6 a	1.60 a
AVG	1504.8	92.66	33.92	10133	20.91	1.63
LSD 05	527.5	8.18	4.27	7692.3	3.38	0.256
CV %	20.3	5.1	7.28	43.9	8.89	8.63
1995						
30"	1724 a		35.8 a	42199 a		
36"	1546 a		37.5 a	37208 a		
40"	1343 a		37.5 a	32670 a		
AVG	1536.8		36.9	37358.8		
LSD 05	504.6		2.69	16951.8		
CV %	18.9		4.21	26.2		
Average over 1994 and 1995						
30"	1637		34.4	28110		
36"	1639		36.1	23936		
40"	1289		35.8	19192		

**Table 6. Seedcotton yield and other agronomic factors for earlier maturing Pima cotton as affected by row spacing on the Safford Agricultural Center, 1994-5.**

Treatments	SC Yld	% 1st Pk	PIHt	PI/Ac	Nodes	HNR
Pima S7 - 1994						
30"	2124 a	95.7 a	32.3 a	16471 a	20.1 a	1.63 a
36"	1898 a	93.6 a	29.6 a	15654 a	19.3 a	1.55 a
40"	1883 a	93.7 a	33.6 a	11735 a	21.0 a	1.66 a
AVG	1968.1	94.33	31.83	14620.1	20.13	1.61
LSD 05	1123.5	4.99	5.11	8702.3	4.59	0.68
CV %	33	3.05	9.27	34.4	13.18	13.5
OA 312 - 1995						
30"	1860 a		37.5 a	35846 a		
36"	2332 a		38.0 a	36300 a		
40"	1919 a		33.8 a	32216 a		
AVG	2037.3		36.4	34788		
LSD 05	801.6		6.21	16436		
CV %	22.7		9.87	32.3		
Average over 1994 and 1995						
30"	1992		34.9	26159		
36"	2115		33.8	25977		
40"	1901		33.7	21976		

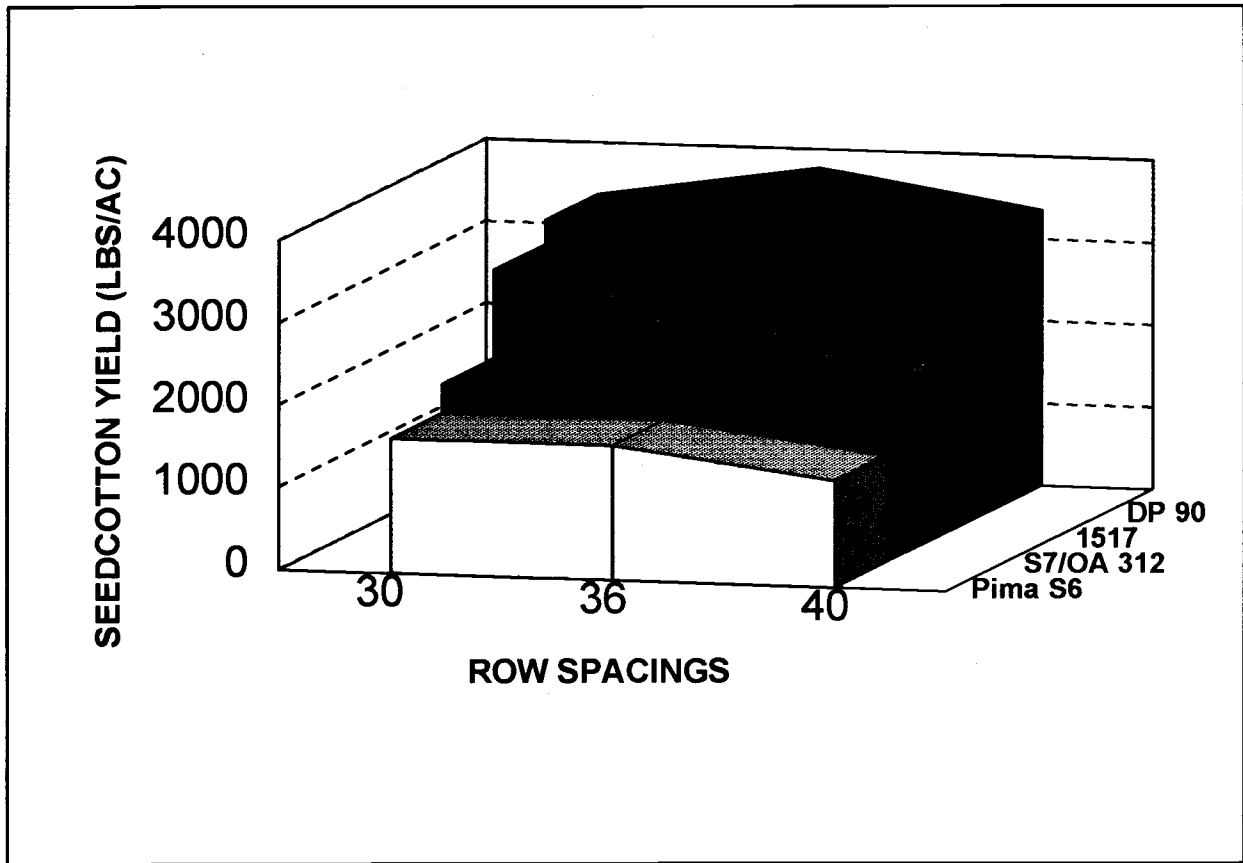


Figure 1. Seedcotton yields by variety and row spacing averaged over 1994 and 1995 data.