

# Date of Planting by Long Staple and Short Staple Variety Trial, Safford Agricultural Center, 1999

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## **Abstract**

*Four varieties each of Long Staple and Short Staple cotton were tested over five and four dates of planting, respectively, in this study. The first date of planting for the Long Staple cotton was the 18<sup>th</sup> of March and for Short Staple cotton the 1<sup>st</sup> of April. The latest planting was May 13th. Cultivars of differing maturities were tested for both long and short staple cotton to determine their optimal planting time. Many agronomic parameters were evaluated to determine the effect of different planting dates*

## **Introduction**

Each year brings with it a new set of weather conditions that may enhance the stand establishment of cotton or be detrimental to it. With these different weather conditions comes a difference in optimal times to plant and sometimes planting dates are pushed beyond the window when varieties are traditionally planted. This study is the third year of a study involving four varieties each of long and short staple cotton. The four varieties for both long and short staple cotton were selected to cover the range from full season to short season varieties that are or could become of importance in the area.

## **Materials and Methods**

The varieties being tested were planted in a replicated small plot design with two rows of each variety being planted in four replicates at each planting date. The crop history is included below to define the cultural practices.

### Crop history - Long Staple

Soil type: Grabe clay loam

Previous crop: Cotton

Planting date: 18 Mar, 1 Apr, 15 Apr, 29 Apr and 13 May 1999                      Rate: 25 lbs/ac

Herbicide: 1.5 pts/ac Treflan preplant incorporated, Prometryne at lay-by

Fertilizer: 100 lbs/ac urea side dressed 6/11, 100 lbs/ac urea side dressed 7/20

Irrigation: Watered up plus 7 irrigations (40 ac in + 3.9" rain)                      Last date: 1 September

Harvest: 1st pick: 16 November                      2nd pick: not done

Heat units from plant to harvest (86/55°F): 3629, 3541, 3466, 3297 and 3312 for dates 1-5 respectively

### Crop history - Short Staple

Soil type: Grabe clay loam/Pima clay loam variant

Previous crop: Cotton

Planting date: 1 Apr, 15 Apr, 29 Apr and 13 May 1999                      Rate: 25 lbs/ac

Herbicide: 1.5 pts/ac Treflan preplant incorporated, Prometryne at lay-by

Fertilizer: 100 lbs/ac urea side dressed 7/2, 100 lbs/ac urea side dressed 7/22

Irrigation: Watered up plus 7 irrigations (40 ac in + 3.9" rain) Last date: 1 September  
Harvest: 1st pick: 5 November 2nd pick: not done  
Heat units from plant to harvest (86/55 °F): 3541, 3466, 3297, and 3132 for dates 1-4, respectively

Plots were harvested with a modified two-row cotton picker which allowed cotton to be collected from each plot in large cloth bags. Weights were then obtained by weighing the bags on an electronic platform scale.

## Results and Discussion

Figure 1 shows the Maximum and Minimum temperatures and heat units (86/55), all in degrees Fahrenheit, for several days after each planting date. Only long staple varieties were planted on the March 18<sup>th</sup> date and it can be seen that two days after planting heat units were 10 or above making conditions good for germination. On the April 1<sup>st</sup> planting date heat units were essentially nil until five days after planting, when 8 heat units were received. This period was hard on seeds trying to germinate and also hard on recently germinated seedlings from the previous planting. Heat units after the 15<sup>th</sup> of April were fairly favorable with between 7 and 9 the first two days going up to 14 by the fifth day. The next planting date was a bit more variable, starting at 9 HU, dropping into the 4's and then getting into the 10's by the 4<sup>th</sup> day. By the May 13<sup>th</sup> planting date daytime temperatures were into the 90's, lows approaching the 50's and heat units moving from the mid teens toward 20.

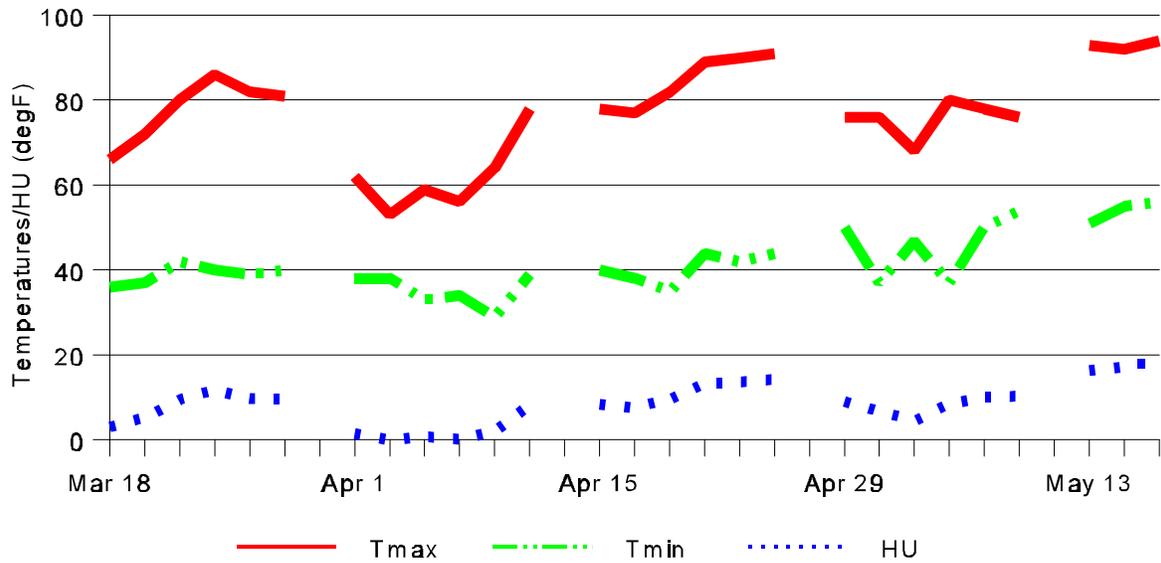
A two-way analysis of the data from the date of planting by short staple varieties is shown in Table 1. The upper part of the table is the response of varieties across all dates of planting. The middle portion of the table is the response of dates of planting across all varieties. General strengths of varieties or appropriateness of planting date are seen from this table, but how individual varieties fared under different planting dates is masked. Stoneville 474, a mid seasoned variety, produced the highest yield over the four dates of planting, but none of the varieties were separable statistically. Amazingly, the April 1<sup>st</sup> planting date produced the highest yield, followed closely by the May 13<sup>th</sup> date of planting. To explain how the April 1<sup>st</sup> planting survived, the 2" soil temperatures were reviewed. The 2" soil temperature was 58°F on planting date. This dropped into the low 50's for 4 days and then increased into the 60's. Some developmental damage might have occurred at the low temperatures, but they did not affect yield. Plant populations at the earlier dates of planting were less than those seen at the last date of planting, but the reductions of the numbers of plants seen were not sufficient to reduce yields. Table 2 continues the agronomic data collected from this trial. These variables were not statistically correlated to yield but may be of interest for comparisons between varieties or between dates of planting.

Table 3 provides yield and agronomic values from the long staple study. The upper part of the table shows the effect of the four varieties over all five dates of planting and the middle part of the table shows the effects of the dates of planting over the four varieties. Yields were not in the acceptable range with only OA 312 producing over one bale per acre. Interestingly, OA 312 was the lowest yielding variety in the Regional Pima Variety Trial (1). Part of the low yields for this study are seen in the date of planting part of the table. The first and second planting did not have adequate plant populations and in a farmer's field would have been disced up and replanted. Because of the nature of this experiment, this was not done. The best date of planting was the middle of April, as has been demonstrated in previous studies (2).

The most significant thing shown in this study is that both long and short staple varieties produce best if planted when soil and air temperatures are favorable for physiological growth. This typically occurs in the Safford Valley in the third week in April.

## References

1. Clark, L.J. and E.W. Carpenter. 2000. Pima cotton regional variety trial, Safford Agricultural Center, 1999. *In this publication*
2. Clark, L.J. and E.W. Carpenter. 1999. Date of planting by long staple and short staple variety trial, Safford Agricultural Center, 1998. Cotton, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-116, pp, 38-45.



**Figure 1. Maximum and minimum temperatures and heat units over several day periods following planting dates at the Safford Agricultural Center, 1999.**

**Table 1. Yield and other agronomic data from short staple date of planting study, Safford Agricultural Center, 1999.**

Treatment	Lint Yield	% Lint	Plant Height	Plants/Acre
Varieties over dates of planting				
DP 90	1128 a <sup>1</sup>	38.2 b	41.4 a	45318 ab
FM 989	1200 a	39.4 a	36.9 b	54337 a
STV 474	1276 a	39.4 a	35.2 b	40497 b
SG 125	1180 a	39.3 a	35.6 b	45715 ab
Dates of planting over varieties				
April 1st	1238 a	38.9 a	35.8 a	36584 c
April 15th	1193 a	39.0 a	39.1 a	49629 b
April 29th	1125 a	38.9 a	36.5 a	39363 c
May 13th	1226 a	39.4 a	37.7 a	60292 a
Average	1195.8	39.06	37.27	16166.8
LSD(05)	151.2	0.92	3.3	9448.4
CV(%)	17.8	3.3	12.5	28.6

1. Numbers followed by the same letter, within columns, are not statistically different at the 95% level of confidence using Duncan's Multiple Range test.

**Table 2. Other agronomic data from short staple date of planting study, Safford Agricultural Center, 1999.**

Treatment	1 <sup>st</sup> Frting Br	Frting Nodes	Tot Nodes	HNR	10 Boll Wt
Varieties over dates of planting					
DP 90	6.8 ab <sup>1</sup>	11.8 a	24.6 a	1.69 a	50.7 b
FM 989	7.8 a	9.5 b	22.6 b	1.64 a	54.2 a
STV 474	6.3 b	11.6 a	22.9 ab	1.58 a	51.4 b
SG 125	6.8 ab	11.0 ab	23.6 ab	1.51 a	51.8 ab
Dates of planting over varieties					
April 1st	6.4 b	11.3 a	24.0 ab	1.54 a	51.7 a
April 15th	7.2 ab	11.0 a	25.3 a	1.55 a	51.3 a
April 29th	6.3 b	11.5 a	22.4 bc	1.63 a	52.6 a
May 13th	7.9 a	10.0 a	22.1 c	1.70 a	52.5 a
Average	6.9	10.97	23.4	1.606	52.0
LSD(05)	1.02	1.82	1.72	0.17	2.47
CV(%)	20.6	23.3	10.3	14.9	6.7

1. Numbers followed by the same letter, within columns, are not statistically different at the 95% level of confidence using Duncan's Multiple Range test.

**Table 3. Yield and other agronomic data from long staple date of planting study, Safford Agricultural Center, 1999.**

Treatment	Lint Yield	% Lint	Plant Height	Plants/Acre
Varieties over dates of planting				
Pima S-6	416 b <sup>1</sup>	34.9 b	37.3 a	24956 b
Pima S-7	415 b	36.3 a	33.0 b	28042 ab
OA 325	442 b	36.3 a	33.8 b	31400 a
OA 312	560 a	34.8 b	34.7 ab	28223 ab
Dates of planting over varieties				
March 18th	383 c	35.8 a	34.0 b	12478 c
April 1st	44 d	34.9 a	34.8 b	3857 d
April 15th	659 a	36.3 a	29.4 c	50366 a
April 29th	644 a	35.3 a	36.0 b	29267 b
May 13th	562 b	35.5 a	39.2 a	44808 a
Average	458.3	35.56	34.68	28155.2
LSD <sub>VAR</sub> (05)	65.9	1.24	2.81	4974.7
LSD <sub>DAT</sub> (05)	73.7	1.39	3.14	5561.9
CV(%)	22.7	5.5	12.8	27.9

1. Numbers followed by the same letter, within columns, are not statistically different at the 95% level of confidence using Duncan's Multiple Range test.

**Table 4. Other agronomic data from long staple date of planting study, Safford Agricultural Center, 1999.**

Treatment	1 <sup>st</sup> Frting Br	Frting Nodes	Tot Nodes	HNR	10 Boll Wt
Varieties over dates of planting					
Pima S-6	6.3 a <sup>1</sup>	12.8 a	22.8 a	1.66 a	40.0 a
Pima S-7	6.4 a	11.7 a	20.6 b	1.64 a	37.3 a
OA 325	6.4 a	11.7 a	21.2 b	1.62 a	39.8 a
OA 312	5.2 b	13.1 a	21.5 ab	1.63 a	37.6 a
Dates of planting over varieties					
March 18th	5.6 bc	13.6 b	22.0 b	1.57 bc	38.5 ab
April 1st	5.2 c	15.5 a	24.2 a	1.44 c	43.7 a
April 15th	6.2 ab	9.2 d	18.4 c	1.62 b	34.9 b
April 29th	6.6 ab	12.3 bc	22.2 b	1.65 b	38.8 ab
May 13th	6.8 a	11.0 c	20.7 b	1.91 a	37.4 b
Average	6.08	12.3	21.5	1.64	38.7
LSD <sub>VAR</sub> (05)	0.86	1.32	1.36	0.15	4.87
LSD <sub>DAT</sub> (05)	0.96	1.48	1.52	0.17	5.44
CV(%)	22.3	17.0	10.0	14.8	19.9

1. Numbers followed by the same letter, within columns, are not statistically different at the 95% level of confidence using Duncan's Multiple Range test.