

Cotton Variety Trial, Safford Agricultural Center, 1990

Lee J. Clark and Eddie W. Carpenter

Abstract

Forty four short staple varieties and Pima S-6 were grown in a replicated trial on the Safford Agricultural Center in Graham county. Most of the varieties were commercially available in the cotton belt, however, a few experimental varieties from the New Mexico acalas, ChemBred and from Delta Pines were included. Seventeen varieties produced more than 4000 pounds of seed cotton per acre with the top variety, BR 110, yielding 4921 pounds per acre. The second variety, HS Sal 10, is a new variety developed by Bill Salmons.

1990 contained some record breaking high temperatures in the month of June which were detrimental to yields in other parts of the state. In this area, this heat spell was not as devastating and in some respects this year was a better cotton year than even 1989.

Introduction

This trial is a replicated, small plot, variety test designed to screen a large number of short staple and acala cotton varieties before they are taken to farmers fields for further testing.

Materials and Methods

The following crop history provides the essential details on how the test plots were managed.

Crop History:

Soil type: Pima silty clay variant/ Grabe clay loam

Previous crop: Barley

Tillage: Ripped, disced, and bedded

Planting: Date: 23 April 1990 Rate: 25 pounds per acre

Herbicide: Trillin preplant incorporated

Fertilizer: 106 pounds per acre 16-20-0 preplant

150 pounds per acre Urea side dressed on 5 June

25 pounds of N side dressed on 8 Aug

Irrigation: Irrigated up and 8 irrigations (ca. 40 ac inches)

Plot size: 50 feet long, 2 or 4-36 inch beds wide

Defoliation: None

Harvest: First pick: 23 October

Second pick: 20 November

Heat units per growing season: 3545 (86/55, sine curve)

The plots were planted with a cone planter, which delivered the same volume of seed to each plot, so the final plant populations were affected by both seed size and seedling vigor.

The plots were picked with a modified 2-row cotton picker. The cotton from each plot was caught in a sack and weighed on hanging scales. Sub samples were taken to determine percent lint turnout and lint quality.

Results and Discussion

1989 was touted as a super year for cotton production with a long warm season with many heat units during the cotton growing season, 3849 heat units were recorded between planting and first pick (1). The 3545 heat units received in 1990 seemed pale in comparison until one looked more closely at the actual weather data (Figure 1). May of 1990 was slightly cooler than May of 1989, but after the first two days of 1990, the weather was more uniform and ideal for cotton development. June of 1990 was known as the scorcher, with three new record high temperatures being set between the 25th and 28th of the month, but 1989 had more heat units in April, May, July and August. From planting date to first pick an average of 19.37 heat units per day were received compared with 18.4 heat units per day in 1989, so at this site, 1990 was a superior year to 1989 in situations where plants were not stressed during the heat spell at the end of June. The varietal yields in this trial corroborated this information.

BR 110 was the highest yielding variety (Table 1) as it had been in 1988 (2). KC 311, DP 90 and DP 77 were in the top few varieties as is normally the case. Newcomers to the top 10 were HS Sal 10, a new variety from Bill Salmons in Stanfield, AZ; two new entries from Delta and Pine Land Co. and Prema from the California Planting Cotton Seed Distributors. Prema also made good showings in the on-farm test plots in Graham county (3). There is considerable interest in Acala Prema and in the New Mexico acalas to see if they can produce the same yields and a premium even higher than that of DP 90.

Other varieties of interest: ChemBred hybrids are the entries preceded by a 'CB', two of them had yields in excess of 4000 pounds per acre which is encouraging considering that most of them are being bred for the southern market. New Mexico's new storm resistant variety (1517-SR3) produced more cotton than the first two SR varieties. Hartz varieties are oca-leafed types and yielded around 2.5 bales of lint, but produced significantly less than the leading varieties.

Stoneville's KC 311 had the highest percentage of harvest in the first pick and not surprisingly, Pima S-6 had the lowest. There were some significant differences in these values, but most varieties tested fell between 90 and 97%. Plant heights varied from 31.3 inches to 44.8 inches tall with 1517-SR1 being the shortest and DP 5816 the tallest. Plant populations were quite uniform and all varieties had adequate populations. From a correlation analysis of all of the variables in Table 1 it was found that there are very highly significant positive correlations between Seed Cotton Yield and both Plant Height and Percent First Pick.

References

1. Clark, Lee J. and E.W. Carpenter. 1990. Cotton Variety Trial, Safford Agricultural Center, 1989. Cotton, A College of Agriculture Report, The University of Arizona, Tucson. Series P-81, pp.75-77.
2. Clark, Lee J. and Eddie W. Carpenter. 1989. Cotton Variety Observations, Safford Agricultural Center, 1988. Cotton, A College of Agriculture Report, The University of Arizona, Tucson. Series P-77, pp. 134-6.
3. Clark, Lee J. and Ronald E. Cluff. 1991. Short Staple Variety Demonstrations, Graham County, 1990. Cotton, A College of Agriculture Report, The University of Arizona, Tucson. In press.

Table 1. Yield, percent first pick, plant height and population of short staple varieties grown on the Safford Agricultural Center, 1989.

Variety	SC Yield ¹	Percent 1st Pk	Plant Height ²	Plant Population	% of DP 90
BR 110	4921 a ³	95.9 ab	38.0 a-e	50826 ab	115.9
HS Sal 10	4881 ab	96.9 ab	35.3 b-e	51128 ab	115.0
KC 311	4698 abc	97.8 a	39.8 a-d	46288 ab	110.6
DP 5816	4695 abc	96.5 ab	44.8 a	46590 ab	110.6
DP 77 (orig)	4614 a-d	96.0 ab	38.0 a-e	46893 ab	108.7
DP 77	4516 a-e	96.9 ab	40.5 a-d	54456 ab	106.4
DP 8118	4361 a-f	96.1 ab	40.7 a-d	48708 ab	102.7
1517-88	4266 a-g	95.8 ab	39.0 a-e	47801 ab	100.5
DP 90	4246 a-g	96.8 ab	37.0 a-e	50070 ab	100.0
Acala Prema	4221 a-g	94.2 abc	39.3 a-e	49313 ab	99.4
Acala 2745	4184 a-g	97.0 ab	40.3 a-d	42960 ab	98.5
HS 46	4177 a-g	94.1 abc	34.5 b-e	51734 ab	98.4
BR 115	4167 a-g	95.7 ab	36.2 b-e	49011 ab	98.1
CB 407	4158 a-h	95.8 ab	33.5 de	49011 ab	97.9
CBX 1220	4091 a-h	94.5 abc	35.2 b-e	50826 ab	96.3
C-37	4012 a-h	93.4 abc	38.5 a-e	52944 ab	94.5
STV 1324	3974 a-i	92.8 abc	35.3 b-e	44473 ab	93.6
1517-75	3951 a-i	95.2 ab	42.8 ab	49313 ab	93.1
Acala 3579	3931 a-i	95.8 ab	36.7 a-e	52036 ab	92.6
DES 119	3902 a-i	94.7 ab	34.3 cde	52944 ab	91.9
CB 219	3888 a-i	94.1 abc	36.3 b-e	47498 ab	91.6
STV 506	3840 b-i	96.0 ab	34.5 b-e	44775 ab	90.4
Delcote 344	3837 b-i	96.0 ab	33.0 de	52036 ab	90.4
CBX 1221	3790 c-i	94.1 abc	35.8 b-e	52036 ab	89.3
Hartz 1014	3778 c-i	93.0 abc	35.3 b-e	52641 ab	89.0
Acala 3080	3734 c-i	95.1 ab	35.5 b-e	49616 ab	87.9
Hartz 1416	3730 c-i	94.2 abc	36.2 b-e	40842 b	87.8
C-40	3670 c-i	94.1 abc	36.0 b-e	46590 ab	86.4
1517-SR3	3660 c-i	93.8 abc	38.0 a-e	54456 ab	86.2
Acala B2541	3632 c-i	94.1 abc	37.0 a-e	46893 ab	85.5
STV 453	3624 d-i	95.7 ab	34.7 b-e	46288 ab	85.3
CB 1135	3583 d-i	93.0 abc	37.2 a-e	44775 ab	84.4
S-1001	3531 e-i	95.2 ab	36.0 b-e	41447 b	83.2
Acala 6658	3502 e-i	95.7 ab	37.2 a-e	44473 ab	82.5
Acala B510	3495 e-i	93.2 abc	36.0 b-e	48406 ab	82.3
Pima S-6	3485 e-i	85.0 d	37.0 a-e	45683 ab	82.1
Coker 130	3418 f-i	94.9 ab	42.2 abc	42960 ab	80.5
1517-77BR	3401 f-i	94.6 abc	38.2 a-e	48406 ab	80.1
1517-SR2	3303 f-i	94.0 abc	36.3 b-e	56272 a	77.8
CB 232	3248 ghi	89.6 c	34.9 b-e	48225 ab	76.5
STV 907	3248 ghi	94.2 abc	37.3 a-e	44473 ab	76.5
1517-V	3207 ghi	94.6 abc	35.8 b-e	54456 ab	75.5
S-89	3094 hi	92.2 bc	34.3 cde	47195 ab	72.9
1517-SR1	2929 i	94.9 ab	31.3 e	43868 ab	69.0
Averages	3885.3	94.7	37.0	48482.3	
LSD (05)	860.6	4.1	6.8	11316.4	
C.V. (%)	16.6	3.1	11.6	14.4	

1. Seed Cotton yields in pounds per acre.

2. Plant height in inches.

3. Values within a column followed by the same letter are not significantly different at the 5% level of probability using the Duncan multiple range test.

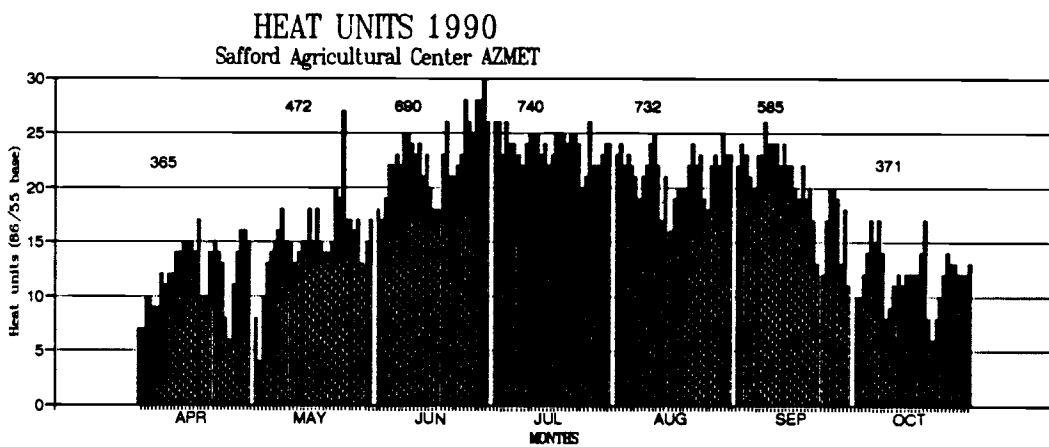
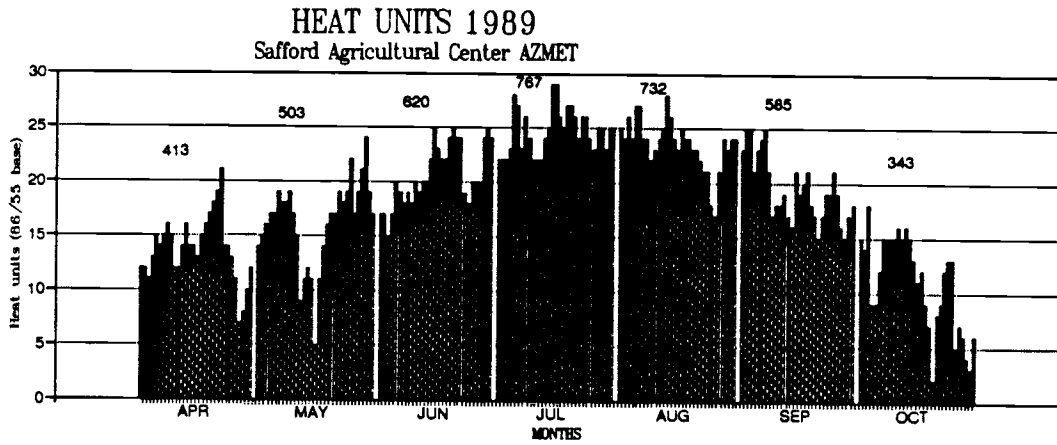
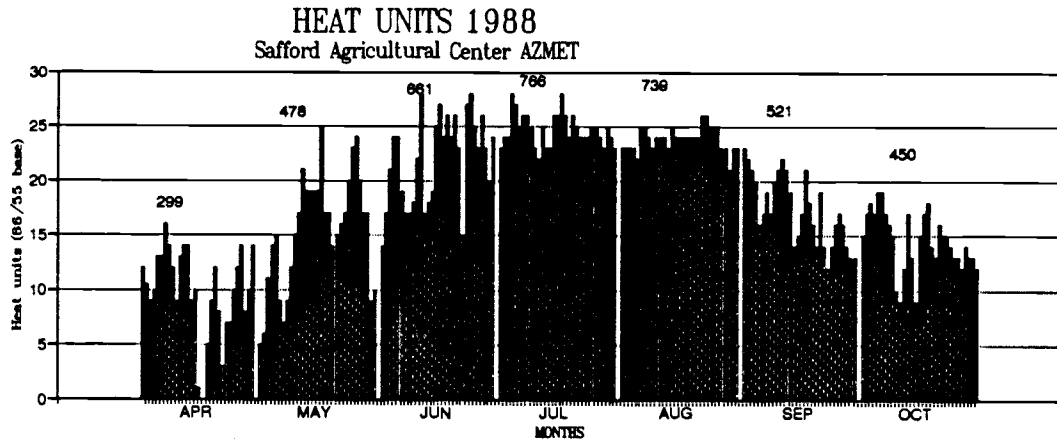


Figure 1. Heat units for the cotton growing season at Safford Agricultural Center, 1988 to 1990.