

Short Staple Variety Demonstration, Graham County, 1992

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Abstract

Twelve upland cotton varieties were compared in an on-farm trial in Graham county. The highest yielding variety was Stoneville 324, a relatively new semi-smooth-leaved variety from Stoneville with fiber qualities that approach those of DPL 90. Stoneville 324 yielded 4226 pounds of seed cotton with HS Sal 10 following closely behind at 4158 pounds per acre.

Introduction

The cotton variety demonstration was part of a larger study organized by Dr. Jeff Silvertooth whereby two varieties each were submitted by five seed groups to be tested at several locations around the state. The primary objective of that study was to follow the physiological development of the various cultivars throughout the growing season. Those objectives will be discussed in a separate paper in this publication (1). Our main objective in the trial was yield and earliness comparisons and these results are recorded in this paper. This test is continuation of the variety comparisons performed over the past several years.

Materials and Methods

The crops were grown in cooperation with Dennis Layton using his equipment and his normal cultural practices. The varieties were planted in two row plots in four replications. The varieties were harvested separately and weighed in the field using trailer scales. Subsamples were taken for lint analysis.

Plot size: Two 38 inch rows approximately one quarter mile long.

Location: Layton Farms, Thatcher, AZ

Soil type: Pima clay loam

Elevation: 3000 feet

Previous crop: Cotton

Planting date: 13 April 1992 **Rate:** 25

Herbicide: Banded Caparol and MSMA at layby

Fertilizer: Water run NH₃ 3 times (approx. 65 lbs of N each time)

Irrigation: furrow irrigated, approximately 4 ac feet

Insecticide: One application for lygus

Pix: None

Defoliation: Sodium chlorate

Replications: Four

Harvest: 1st Pick: 19 October 2nd Pick: 16 November

Plot size: Two 38 inch rows approximately one quarter mile long

Heat units during the growing season: 3615 (86/55 basis)*

* These heat units were calculated from AZMET data from the Safford Agricultural Center, starting with the

* These heat units were calculated from AZMET data from the Safford Agricultural Center, starting with the day of planting and going until the first pick date.

Results and Discussion

The average winter and early spring temperatures for the Safford area were about normal, but the average low temperatures were higher than normal. This produced more heat units than normal. This trend continued through April and into the first part of May. The favorable weather aided cotton emergence and stand establishment. Cold spells came in the middle of May and again in June and July. Night time temperatures dropped below 50°F in both May and June. These cool spells slowed down the heat unit accumulations and the year ended up about average.

The results of the 1992 demonstration on the Layton farm are shown in Table 1. Stoneville 324, the top yielding variety, was first planted in the county trials in 1991 where it came in third place in the Colvin trial (5) and 18th out of 42 in the Safford Ag Center trial (6). It is interesting to note that two of the top three varieties, STV 324 and CB 407, had a percent first pick above the average in the trial and the other, HS Sal 10 was last. This indicates that their maturity is quite different, but they still all yielded quite well given the diversity of the weather pattern. Plant populations were quite high, about 20,000 plants per acre higher than normal for this grower, this being attributed to the favorable weather conditions in April. Plant heights were quite short, perhaps due to early fruit set.

Table 2 gives the yield data for four of the top yielding varieties grown on the Layton farm, in the same field with the same cultural practices for four of the past five years. The average yields of all varieties planted in the trials and the number of heat units received during each growing season are also listed. SureGrow 1001, Delta Pine 90 and Stoneville KC 311 had averages that differed by just a few pounds of seed cotton. One data point that was out of place was KC 311 in 1989. Looking back at the data from 1989 (3) one sees that the seed lot for KC 311 was poor that year resulting in a plant population around 30,000 plants per acre less than the average plant population seen in the trial. Interestingly, the yield of 1517-88 was about 10% less than the top varieties in the trial, and its premium over these years was only 8.5%. This means that the New Mexico acalas are still short one to two percent in their earning power in this area.

One objective in looking at the data over these years along with the heat units was to establish the relation between heat units and cotton yield. A correlation analysis was done on the data in table 2 with the following results: -the correlation of heat units to Upland trial average had an r^2 value of .11 and a probability value (P) of .88. (In other words the two were poorly correlated and if you tried to predict yields using heat units, you would be wrong 88% of the time.) -the correlations between heat units and yields of SG 1001, DPL 90, KC 311 and 1517-88 were $r^2 = .95, .50, .95$ and $.05$, and $P = .21, .50, .05$ and $.95$, respectively. More important than how many heat units were received is the way that they were received. Figure 1 shows the differences between bi-monthly heat units and the average heat units received.

References

1. Silvertooth, J.C., et.al. 1993. Found elsewhere in this report.
2. Clark, L.J. and R.E. Cluff. 1989. Short staple variety demonstration, Graham county, 1988. Cotton, A College of Agriculture Report, The University of Arizona, Tucson. Series P-77, pp. 123-8.
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6. Clark, L.J. and E.W. Carpenter. 1992. Cotton variety trial, Safford Agricultural Center, 1991. Cotton, A College of Agriculture Report, The University of Arizona, Tucson. Series P-91, pp.58-61.

Table 1. Yield and crop characteristics of short staple cotton varieties grown on the Layton Farm in Thatcher in 1992.

Variety	Seed Cotton Yield (lbs/ac)	Percent 1st Pick	Plant Height (in)	Plant Population	% Yld of DP 90
STV 324	4226.1 a ¹	94.2 d	28.0 bc	61479 c	111.3
HS SAL 10	4158.1 a	88.5 h	27.3 bcd	81040 a	109.5
CB 407	3920.7 a	95.1 b	29.5 ab	69218 bc	103.3
SG 1001	3903.9 b	94.7 c	29.9 ab	79106 ab	102.8
STV KC 311	3879.3 b	94.7 c	29.2 abc	86414 a	102.2
DPL 90	3796.1 bc	94.3 d	28.5 abc	83620 a	100.0
HS 46	3729.8 c	94.1 de	29.5 ab	79321 ab	98.3
DPL 5415	3587.4 d	93.2 g	26.8 cd	70077 bc	94.5
1517-91	3549.1 d	93.7 f	31.1 a	61479 c	93.5
1517-88	3543.6 d	93.7 f	29.6 ab	82330 a	93.3
CB 1210	3453.9 d	95.5 a	29.6 ab	40843 d	91.0
SGX 1211	3443.9 d	93.9 ef	25.0 d	85125 a	90.7
Average	3766.0	93.8	28.7	73355	
LSD (05)	132.9	0.25	2.33	9717.5	
C.V. (%)	7.1	1.85	7.57	20.0	

1. 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.

Table 2. Seed cotton yields from selected upland varieties and test plot averages on the Dennis Layton farm in Thatcher, AZ from 1988 to 1992. Heat units are reported for each year.

Variety	1988	1989	1990	1992	Average
----- Seed Cotton Yld (lb/ac) -----					
Upland Trial Average	3552	4274	3543	3766	3784
SG 1001	--	4808	3563	3904	4092
DPL 90	4054	4880	3549	3796	4070
KC 311	4361	4264	3620	3879	4031
1517-88	3274	4389	3366	3544	3643

Heat Units (86/55)	3870	3712	3491	3615	3672

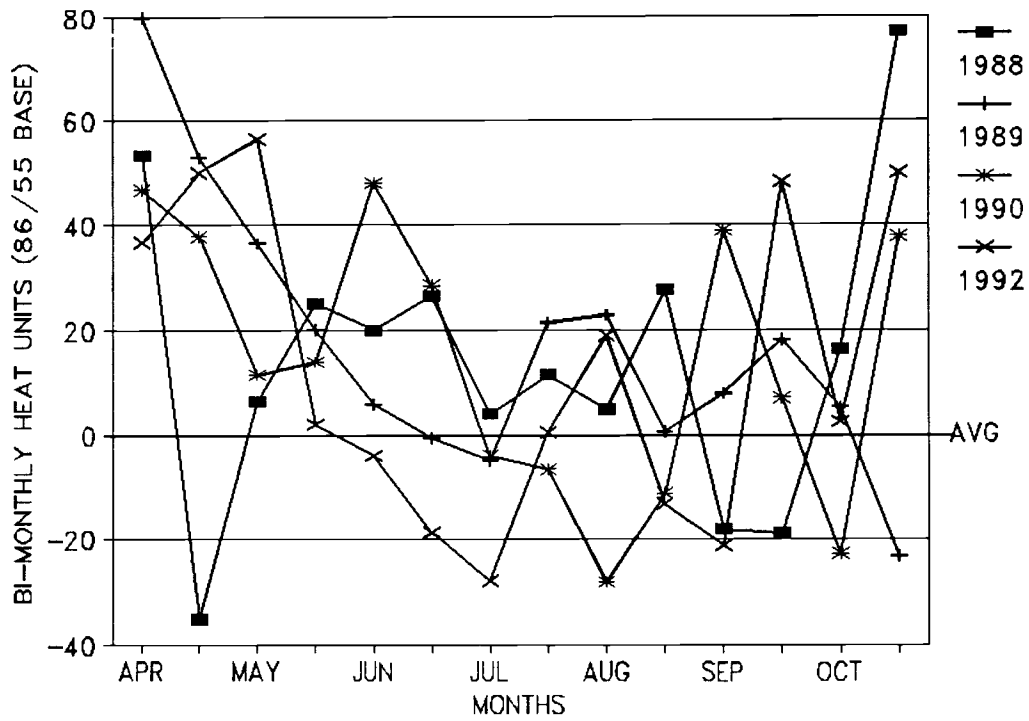


Figure 1. Bi-monthly heat units (86/55°F) for 1988-90 and 1992, recorded at the Safford Agricultural Center.