

Short Staple Variety Demonstrations, Graham County, 1989

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ABSTRACT

Short-staple variety trials were grown in two locations in Graham County in 1989. Exceptional weather conditions, coupled with good management practices, provided record cotton yields in the Safford valley. Delta Pine 77 was the highest yielding variety in the Thatcher location with a yield of 1740 pounds of lint per acre. An experimental acala from New Mexico came in second in this trial, ahead of Delta Pine 90. Delta Pine 90 was the highest yielding variety in the Eden area with a yield of 1196 pounds per acre. Data on percent first pick, plant height and plant populations are presented for each variety in each location. Graphs of heat units received each day throughout the growing season at the AZMET station on the Safford Agricultural Center are presented for 1988 and 1989.

INTRODUCTION

In the continuing search for new short staple cotton varieties that will be viable in Graham County, trials were conducted in Thatcher and Eden again in 1989. The lower yielding varieties were dropped from last year's tests and replaced by new materials that were available. There was considerable interest in premium cottons, so Del Cerro, Prema (from the San Joaquin Valley) and several New Mexico acalas were included in this test.

MATERIALS AND METHODS

The crops were grown with the cooperation of Graham County farmers using their equipment and their 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.

Location 1: Dennis Layton farm, Thatcher, AZ
Soil type: Pima clay loam
Elevation: 2,900 feet
Previous crop: Cotton
Planting date: 7 April 1989 Rate: 27 pounds per acre
Herbicide: Caparol at lay-by
Fertilizer: 125 units of nitrogen
Irrigation: Pre-irrigation + six irrigations (ca. 4 acre feet)
Insecticide: Twice for lygus, used Scout
PIX: 1 pint
Defoliation: Sodium chlorate
Harvest: 1st Pick: 13 October 2nd Pick: 20 November
Plot size: Two 38-inch rows approximately one-quarter mile long
Heat units during the growing season: 3712 (86°/55° basis)*

Location 2: Colvin Farms, Eden, AZ
 Soil type: Grabe clay loam
 Elevation: 2800 feet
 Previous crop: Cotton
 Planting date: 20 April 1989 Rate:
 Herbicide: Caparol and treflan, preplant
 Fertilizer: 50 units of N as anhydrous ammonia, preplant
 Irrigation: furrow irrigated, approximately 4 acre-feet
 Insecticide: one application of Scout
 PIX: None
 Defoliation: Sodium chlorate
 Harvest: 1st Pick: 3 November 2nd Pick: 4 December
 Plot size: Two 38-inch rows approximately one-quarter mile long
 Heat units during the growing season: 3694 (86°/55°) basis*

* These heat units were calculated from AZMET data from the Safford Agricultural Center. The heat units on the site in Eden would have been fewer than this.

RESULTS AND DISCUSSION FOR LOCATION 1

Table 1. Cotton yields and other agronomic parameters for short staple cotton varieties on the Layton farm (Location 1), Graham county, 1989.

Variety	Lint ^a Yield	SC Yield	Percent 1st Pk	Plant ^b Height	Plant Popn
DP 77	1739.6	5116 a ^c	90.3 d	29.8 ab	53740 c
Acala 6658	1686.4	4960 a	88.8 e	32.3 a	73947 a
DP 90	1659.8	4882 a	93.4 b	31.4 a	69433 ab
S 1001 ^d	1634.7	4808	94.8	32.5	71797
BR 110	1622.5	4772 a	90.3 d	29.6 ab	67928 ab
1517-88	1492.2	4389 b	90.5 d	30.8 ab	78246 a
NK KC 311	1449.7	4264 b	95.2 a	31.5 a	29665 e
Delcott 344	1401.8	4123 bc	92.4 c	27.4 b	68358 ab
1517-SR1	1335.3	3927 c	90.2 d	28.9 ab	58040 bc
Del Cerro	508.0	1494 d	84.1 f	20.9 c	39768 d
Average	1453.0	4273.5	91.0	29.5	61092

- a. Lint yield in pounds per acre was calculated from Seed Cotton yield by using 34% lint turnout for all varieties.
- b. Plant height was measured in inches.
- c. Values followed by the same letters are not significantly different at the 5% level using the Student-Newman-Keuls test.
- d. This variety was tested in three replications beside the main test plot.

This year was an excellent cotton year for this location. Compared with 1988 (1), the average yield was up 167 pounds of lint per acre, plant populations were up and plant heights were down nearly 5 inches. A warm spring allowed a higher percent of the seeds producing plants and an early boll set kept the plants from growing vegetatively. The higher number of heat units recorded between planting and the first picking in 1988 (3870 heat units) compared to 1989 (3712 heat units) could be misleading if one failed to note that the 1989 harvest was two weeks earlier than in 1988. See Graphs 1 and 2 for the heat unit profile for the two years.

Under these conditions, the long seasoned DP 77 was the top yielder with nearly 3.5 bales per acre. Of the varieties that have yielded in the top over the past few years, DP 90 and BR 110 produced well again this year, but NK KC 311 dropped down a bit, probably due to poor seed germination (note its plant population). The exciting news, though, is that two new varieties appeared in the top grouping this year. Acala 6658, a New Mexico experimental, came in number one in a variety trial in Greenlee county (2) and came in number three in the variety trial in Cochise county (3). It looks promising and must be tested further in 1990. S-1001 is another newcomer to the area that did well in the test. It is apparently a cross between DP 90 and McNair 235, and looks a lot like DP 90.

Del Cerro, which ended up on the bottom of the trial, was attacked by a fungus that destroyed its root system.

RESULTS AND DISCUSSION FOR LOCATION 2

Table 2. Cotton yields and other agronomic parameters for short staple cotton variety trials on the Colvin farm (Location 2), Graham County, 1989.

Variety	Lint ^a Yield	SC Yield	Percent 1st Pk	Plant ^b Height	Plant Popn
DP 90 ^c	1196.2	3571 a ^d	94.5 c	42.3 a	52751 bc
BR 110	1166.0	3481 a	92.6 e	37.0 bc	63844 ab
DES 119	1112.6	3321 ab	96.2 a	30.9 de	46647 bc
NK KC 311	1110.2	3314 ab	95.6 b	39.7 ab	26870 de
Delcote 344	1049.8	3134 ab	96.4 a	35.0 cd	44153 bcd
HS 46	1045.2	3120 ab	92.9 e	35.4 cd	54471 bc
Stv 453	1040.5	3106 ab	96.4 a	27.9 e	38693 cde
DP 20	1035.9	3092 ab	93.7 d	27.8 e	52150 bc
1517-88	968.5	2891 b	95.4 b	33.8 cd	75021 a
1517-SR1	826.9	2468 c	93.8 d	33.5 cd	44153 bcd
1517-SR2	745.6	2226 c	94.9 bc	31.7 de	38392 cde
S-55	722.4	2156 c	93.5 d	31.0 de	23775 e
Average	1001.7	2990.0	94.7	33.8	46743
Acala 2745 ^e	1049.9	3134	92.9	34.0	49011
Prema	943.0	2815	92.1	33.8	45142
Del Cerro	617.8	1844	91.0	30.5	34393
Stv 506 ^f	1136.7	3393			

a. Lint yield in pounds per acre was calculated from Seed Cotton

- yield by using 33.5% lint turnout for all varieties.
- b. Plant height was measured in inches.
 - c. The main test with 12 varieties was replicated four times.
 - d. Values followed by the same letters are not significantly different at the 5% level using the Student-Newman-Keuls test.
 - e. This auxiliary test of 3 varieties was planted alongside the main test and replicated 2 times.
 - f. Stoneville 506 was the field variety, its yield came from an 8-acre block adjacent to the main test.

At this location 1989 and 1988 yields and ranking of the top varieties were about the same. Average yields were down about 50 pounds per acre which could be due to the depression in heat units at planting time in 1989 (see Graph 2). Plant heights were suppressed a bit from 1988, probably because early boll set limited growth.

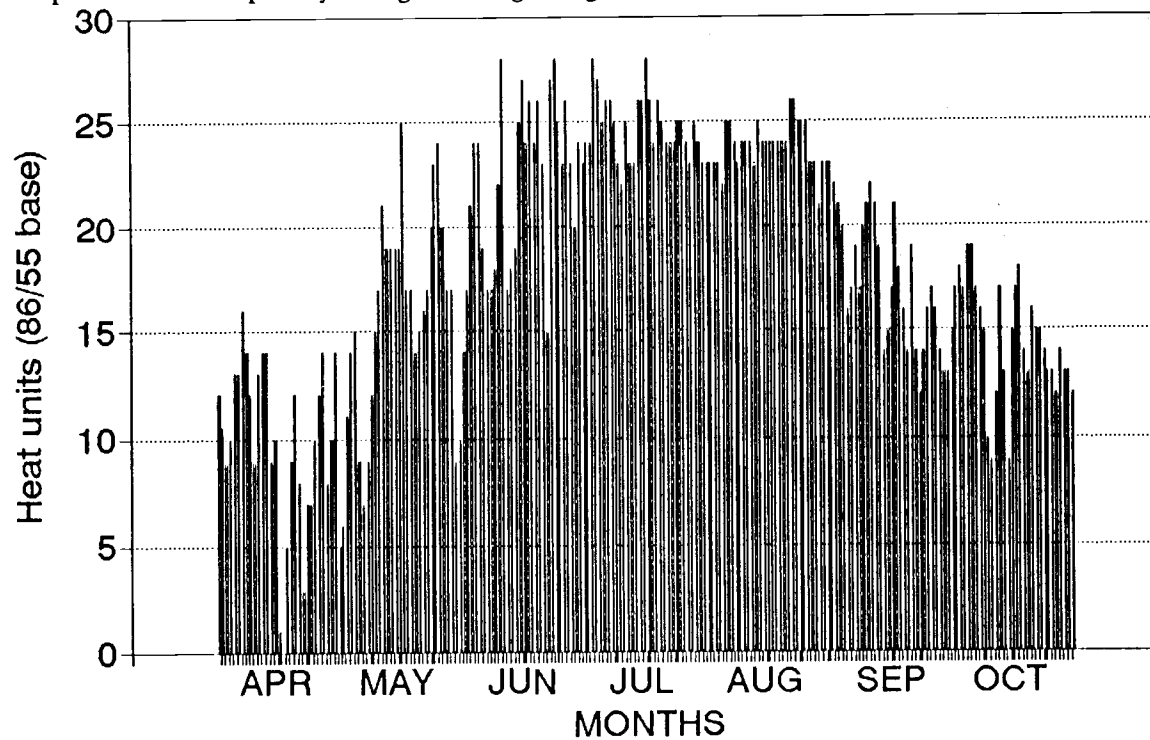
Delta Pine 90, BR 110, Stoneville 506 and DES 119 were rated in the top five varieties last year (1), the only difference was with DP 20 which was number 5 last year but lower down the list this year. Of the New Mexico acalas 2745 moved up the list this year and the others moved down. The large premium that boosted the New Mexico acala value in 1988 wasn't there this year, so there was less pressure on the delta varieties. The new San Joaquin acala, Prema, was tested in the two replication auxiliary test. It yielded about the same as the New Mexico acalas.

The samples taken to evaluate lint turnout and quality from these tests had not been analyzed at the writing of this report.

REFERENCES

1. Clark, Lee J. and Ronald E. Cluff. 1989. Short Staple Variety Demonstration, Graham County, 1988. Cotton, A College of Agriculture Report, University of Arizona, Tucson. Series P-77, 123-8.
2. Clark, Lee J. 1990. Cotton Variety Trials, Greenlee County, 1989. Cotton, A College of Agriculture Report, University of Arizona, Tucson. In press.
3. Clark, Lee J. and Eric Schwennesen. 1990. Short Staple Variety Trial, Cochise County, 1989. Cotton, A College of Agriculture Report, University of Arizona, Tucson. In press.

Graph 1. Heat units per day throughout the growing season, 1988.



Graph 2. Heat units per day throughout the growing season, 1989.

