Short Staple Variety Trial, Greenlee County, 1992

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Abstract

Two New Mexico acalas, one California acala, two upland hybrids and two other upland varieties were evaluated in a two-part trial at one location in Greenlee county in 1992. The New Mexico acalas topped the trial with 1517-91 having the highest yield with 2227 pounds of seed cotton per acre.

Introduction

A couple of new varieties were available that needed to be tested at 3500 to 3600 foot elevation. These included a new entry from ChemBred (CB 1210) that has one acala parent and Stoneville 132, a fast maturing variety. This variety trial is a continuation of the varietal testing that has taken place in Greenlee county over the past several years.

Materials and Methods

Cooperator: Ray Tyler Farm, Duncan, AZ
Soil type: Pima gravelly clay loam
Elevation: 3600 feet
Previous crop: Milo
Planting date: 24 April 1992 Rate: 17 pounds per acre
Herbicide: Treflan and Caparol
Fertilizer: 300 pounds per acre of 16-20-0 preplant
250 pounds per acre of NH_4SO_4
Irrigation: Furrow irrigated 5 times, approximately 2.5 ac feet
Insecticide: None
Pix: 1 pint
Prep: 1 quart
Defoliation: Sodium chlorate
Harvest: 30 October
Plot size: Two 38 inch rows approximately 1700 feet long
Replications: Four

The trial was planted into moist beds using plate type planters and treated throughout the year using the farmers normal cultural practices. At harvest time, cotton from each plot was weighed separately using electronic weighing pads under cotton trailers. Samples were taken to determine quality and lint turnout. Stand counts and plant height measurements were taken and a small sample post mortem plant mapping was done at harvest time.

Results and Discussion

1992 had a late, wet spring much the same as 1991. This made ground preparation difficult. April was warm which helped with stand establishment but it was followed by cold spells in May, June and September which limited yields. Seed cotton yields shown in Table 1 were very similar to the plot yields in Virden in 1991 (1), but both years were about 1000 pounds off the yields seen in 1990 (2). 1517-91 yielded higher than 1517-88 for the second year in a row and came in with the top yield for this year. In the previous year 1517-91 came in second behind CB 1135 at the Virden site and came in fourth place north of Duncan. CB 1135 dropped to the bottom of the list this year. This year was kinder to 1517-88 than the past two years, it yielded next to the top whereas in the two previous years, it yielded in the middle of the pack or lower. Stoneville 506 yielded well this year and performed better than Stoneville 132, which should be faster maturing.

The samples that were taken were ginned off and the gin turnout information is shown in Table 2. The lint turnouts of our hand selected samples run through a small research gin were a couple of points higher than could be expected from a farm sample, but never-the-less should be consistent between varieties. Few differences were seen between varieties, however. 1517-91 and Stoneville 132 may have been a little bit higher and Stoneville 506 may have been a little bit lower than the average. Trash content and seed percentages were also quite close to one another.

Table 3 contains information gleaned from our plant mapping. Small numbers of plants were mapped so differences that are seen may be real or not. The total number of nodes on a plant varied between varieties, but generally were higher on taller plants and lower on shorter plants. GC 510 may be an exception to that observation. Reproductive nodes are nodes whose branches produced open bolls at the end of the season. In this column, Stoneville 506 appears to be the lowest and 1517-88 the highest. The first fruiting node on the plant is the lowest node that produced a branch with an open boll. If this is too low, the plant may be producing bolls that the picker can't pick and if it is too high, it means that the plant lost yield potential. This latter problem could be due to early insect damage or unfavorable physiological conditions of the plant during its early growth. The average of around 7 is a very acceptable value. The Height to Node ratio concept is discussed by Silvertooth, et.al. (3), but, basically is a measure of the plant's vegetative tendencies. A value much above 1.5 would indicate that it was too leggy and should, perhaps, have been controlled with plant growth regulators. A value much below 1.5 would indicate that the plant had been stressed. The values in this column are a little bit low, and may be related with the low yields this year. The last column, percent fruit retention, is also discussed by Silvertooth, et.al. This column is the most interesting in the study and perhaps the most important, as is the fruit that is retained by the plant that you take to the gin. Silvertooth indicates that to shed fruit is natural, since plants generally produce more fruiting sites than they are able to sustain and that the percent fruit retention declines from the beginning of the season to the end. From his studies, an ending value of around 50% fruit retention is about normal. The varieties in this study fell in that area, with the exception of Stoneville 506 and the ChemBred hybrids. These three varieties were well above the norm. Stoneville 506 may had such high retention because it had relatively few fruiting branches, but the two hybrids?? It seems more information is needed before further explanations can be made. It should be noted, however, that higher fruit retention, as we measured it, did not necessarily translate into higher yields.

References

1. Clark, Lee J. and Mike Schneider. 1992. Short Staple Variety Trials, Greenlee County, 1991. Cotton, A College of Agriculture Report, The University of Arizona, Tucson. Series P-91, pp.66-69.

2. Clark, Lee J. and Mike Schneider. 1991. Short Staple Variety Trials, Greenlee County, 1990. Cotton, A College of Agriculture Report, The University of Arizona, Tucson. Series P-87, pp.83-85.

3. Silvertooth, J.C., P.W. Brown, and J.E. Malcuit. 1992. Cotton Crop Growth and Development Patterns. Cotton, A College of Agriculture Report, The University of Arizona, Tucson. Series P-91, pp.9-24.

Table 1. Yield and crop characteristics of upland and acala cotton varieties grown on the Ray Tyler farm in Duncan, 1992. The upper portion of the table is a four-rep trial, the bottom portion is a two-rep trial located at the side of the larger trial.

Variety	SC[1] Yield	Plant[2] Height	Plant Population	Percent of 1517-88
1517-91	2227 a	27.3 cd	50086 ab	104.8
1517-88	**2124 a**	**28.6 bc**	**49441 ab**	**100.0**
Stoneville 506	2084 ab	26.0 de	43207 bc	98.1
GC 510	1822 bc	24.9 e	51376 a	85.7
ChemBred 1210	1804 c	33.9 a	38263 c	84.9
ChemBred 1135	1781 c	30.8 b	42992 bc	83.8
Average	1938.5	28.6	45894	
LSD(05)	263.6	2.2	7054.2	
C.V.(%)	12.0	11.8	13.9	
Stoneville 506	2028 A	26.0 A	41702 A	
1517-91	1897 A	25.5 A	48581 A	
Stoneville 132	1891 A	25.8 A	43422 A	
Average	1938.5	25.8	44569	
LSD(05)	511.2	8.4	10464.1	
C.V.(%)	14.9	4.9	12.4	

1. Seed cotton yield in pounds per acre.
2. Plant height in inches.
3. Values followed the same letter are not significantly different at the 5% level of probability using the Duncan Multiple range test.

Table 2. Gin turnout information for varieties grown on the Tyler farm in Duncan, 1992.

Variety	% Lint	% Trash	% Seed
1517-91	40.4	5.7	54.0
1517-88	38.3	7.1	54.6
Stoneville 506	37.8	6.7	55.5
Stoneville 132	39.8	6.1	53.6
GC 510	38.6	8.3	53.1
ChemBred 1210	38.9	7.6	53.5
ChemBred 1135	38.1	6.2	55.6
Average	38.83	6.81	54.27

Table 3. Plant mapping parameters for varieties grown on the Tyler farm in Duncan, 1992.

Variety	Total Nodes	Reproductive Nodes	First Fruiting Node	Height to Node Ratio	% Fruit Retention
1517-91	18.3	12.0	8.7	1.53	58.6
1517-88	20.0	14.7	7.0	1.39	53.2
Stoneville 506	18.3	10.0	8.7	1.44	81.8
Stoneville 132	17.7	12.0	4.3	1.45	57.4
GC 510	19.3	12.3	6.3	1.41	51.1
ChemBred 1210	22.0	13.0	8.0	1.40	68.8
ChemBred 1135	20.7	13.3	5.7	1.43	65.3
Average	19.47	12.47	6.96	1.44	62.31