

Short Staple Regional Cotton Variety Trial, Safford Agricultural Center, 1997

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Abstract

Twenty five short staple varieties were grown in a replicated field trial on the Safford Agricultural Center. Yields were reduced from what was seen in 1996, with the highest yielding variety, MAC 95 producing less than 2.5 bales per acre. It was followed closely by SG 1001, and DP 90, varieties that have been strong varieties throughout the 1990's. Agronomic values for the plants at harvest and HVI data for lint quality are tabulated in this paper.

Introduction

This experiment is a continuation of the cotton variety testing that has taken place at this Agricultural Center since its inception and is also part of the Regional cotton testing program that takes place across the cotton belt. This test allows newer varieties, together with well tested varieties to be compared with each other and with national standards. The standards included in this test were: Maxxa, Paymaster HS26, SG 125, and Stoneville LA 887.

Materials and Methods

This replicated small plot variety trial was designed to screen a large number of cotton varieties to decide which ones should be tested further in the on-farm testing program. The plots were planted with a cone-type planter which distributes a given weight of seed uniformly over the length of the plot. The seeds were planted into a moist seed bed to promote uniform germination. The following crop history provides the information on how the crop was managed:

Crop History:

Previous crop: Cotton

Soil type: Pima clay loam variant

Re-Planting date: 18 April 1997 Rate: 25 pounds per acre

Herbicide: Triflurilin pre-plant, Cotton Pro at lay-by

Fertilizer: 100 lbs/ac of urea was applied under a green manure crop 2/10, an additional 100 lbs/ac of urea was applied on 6/3 and 7/14

Insecticide: 5 applications of insecticides to control pinkie, aphid and whitefly

Pix/Prep: None

Defoliation: Ginstar

Irrigation: Furrow, pre-irrigated + 6 irrigations (ca. 24 inches + 6 inches of rain)

Harvest dates: 1st pick: 31 October 2nd pick: Not needed

Heat units per growing season: 3788 (86/55)

In early October 25-boll samples were collected by hand to determine boll weights. These samples were then ginned to determine percent lint turnout. The plots were picked using a modified 2-row cotton picker. The production from each plot was caught in a sack and weighed on a hanging scale to determine seed cotton yields. Sub-samples were taken to determine lint quality.

Results and Discussion

This experiment was planted near the ideal time from a long term perspective as well as for this particular year. The cold spells of early April were avoided and adequate heat units were available to get seed sprouted before the cool spells in May arrived. After the middle of May, the temperature warmed up and the crop developed rapidly.

The yield data are found in Table 1 along with the plant populations. Two SureGrow varieties were at the extremes in plant population; SG 821 had the highest population and SG 501 had the lowest. None of the plant populations were very far from the optimum. MAC 95, a cotton variety developed by Dr. Robert McDaniels of the University of Arizona Plant Science Department, was the leading variety in the study with a yield of 1162 pounds of lint per acre. SG 1001 and DP 90, two well known varieties in the area followed closely behind. It is interesting to note that DP 90 yielded 28 pounds more lint than its transgenic counterpart, DP 35B. Two new varieties to our testing program, HYX 4103 and GC 303, followed the DP 35B in yield. The other yield comparison will be left to the reader, depending on the varieties of interest. A second pick was not taken since the majority of the crop was picked in the first picking.

Table 2 contains a continuation of the agronomic data collected. Plant heights were shorter than normal and about 5 inches shorter than seen last year, but interestingly the number of nodes was greater. This, of course, produced smaller height to node ratios (HNR). Plants started fruiting on average two nodes earlier than the previous year, and the early boll load may have reduced the plant height and HNR's. Boll weight was reduced from the previous year. A wealth of material is found in this table for the ardent students of these particular varieties.

The HVI values in Table 3 deserve considerable study time. Compared with last year, the average fiber was shorter, less uniform, weaker, coarser and graded lower. Apparently the climatic conditions were not optimal for good fiber production.

References

1. Clark, L.J., Carpenter, E.W., G.L. Hart and J.M. Nelson. 1997. Short staple cotton variety trial, Safford Agricultural Center, 1996. Cotton, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-108, pp. 159-164.

Acknowledgments

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Table 1. Yield and other agronomic data from the Regional Short Staple Variety Trial, Safford Agricultural Center, 1997.

Variety	SC Yield	% Lint	Lint Yield	Plants/acre
MAC 95	3142 a ¹	37.0 cde	1162 a	51954 a-e
SG 1001	2868 ab	38.8 abc	1108 ab	51501 a-e
DP 90	2872 ab	38.4 a-d	1103 ab	51954 a-e
DP 35B	2880 ab	37.3 cde	1075 ab	45829 a-e
HYX 4103	2767 abc	37.1 cde	1026 abc	58080 abc
GC 303	2729 abc	36.6 e	1011 a-d	53543 a-e
HS 44	2735 abc	36.9 de	1008 a-d	55131 a-d
SG 821	2557 bcd	37.1 cde	949 b-e	61029 a
SG 248	2553 bcd	37.1 cde	947 b-e	48324 a-e
STV 474	2335 c-f	38.7 abc	905 c-f	43787 cde
SG 125	2347 c-f	37.7 b-e	886 c-f	53089 a-e
LA 887	2170 d-h	39.8 a	861 d-g	48324 a-e
SG 404	2468 b-e	34.4 fg	849 d-h	50820 a-e
BXN 47	2182 d-h	37.9 b-e	827 e-h	51047 a-e
1517-95	2218 d-h	37.1 cde	823 e-h	45602 a-e
GC 271	2347 c-f	34.9 f	821 e-h	42426 de
SG 501	2077 e-h	39.2 ab	815 e-h	38569 e
SG 180	2142 d-h	37.9 b-e	811 e-h	44468 b-e
DP 5409	2154 d-h	37.4 cde	805 e-h	53089 a-e
MAXXA	1920 fgh	39.3 ab	755 f-i	45602 a-e
DP 50	2251 d-g	33.1 g	746 f-i	59441 ab
GC 120	1940 fgh	36.6 de	712 ghi	51501 a-e
STV 132	1904 fgh	36.6 e	697 ghi	40384 de
1517-91	1855 gh	37.1 cde	688 hi	54450 a-d
HS 26	1803 h	34.0 fg	613 i	48551 a-e
Average	2369.8	37.1	880.1	49939.7
LSD(05)	371.5	1.5	141.9	12557.9
CV(%)	11.1	2.8	11.4	17.8

1. Values within a column followed by the same letter are not significantly different at the 95% level of confidence using the Duncan Multiple Range test.

Table 2. Continuation of Table 1, other agronomic data from the Regional Short Staple Variety Trial, Safford Agricultural Center, 1997.

Variety	Plant Height	Nodes	HNR	1st Frt Br	Seed Vigor	Boll Wt
MAC 95	33.3 ab	26.9 a-d	1.25 a-d	5.7 a	1.06 abc	4.45 fg
SG 1001	33.1 ab	25.8 a-f	1.30 abc	3.9 b-e	1.30 a	4.62 efg
DP 90	33.0 ab	27.1 abc	1.23 a-d	3.3 cde	1.16 abc	4.67 efg
DP 35B	32.6 abc	25.3 a-g	1.30 abc	3.0 cde	0.84 abc	4.86 c-f
HYX 4103	31.4 a-f	26.3 a-c	1.20 a-d	3.0 cde	1.16 abc	4.49 fg
GC 303	31.4 a-f	27.8 a	1.13 cde	4.7 b-e	1.04 abc	4.45 fg
HS 44	31.8 a-d	25.4 a-f	1.25 a-d	3.9 b-e	0.98 abc	4.55 fg
SG 821	27.8 ghi	27.3 ab	1.00 de	4.3 bcd	1.29 a	4.80 def
SG 248	31.6 a-e	25.6 a-f	1.25 a-d	4.2 bcd	0.78 bc	4.80 def
STV 474	29.3 c-i	24.5 b-h	1.18 a-e	3.2 cde	0.98 abc	4.83 c-f
SG 125	26.9 i	22.0 h	1.23 a-d	5.0 ab	1.00 abc	4.89 c-f
LA 887	31.8 a-d	24.0 c-h	1.33 ab	3.7 b-e	0.93 abc	6.38 a
SG 404	27.9 f-i	23.8 d-h	1.23 a-d	4.3 bcd	1.23 ab	4.58 fg
BXN 47	30.6 a-h	24.5 b-h	1.25 a-d	3.9 b-e	0.91 abc	4.88 c-f
1517-95	34.1 a	25.1 a-h	1.35 a	3.0 de	1.03 abc	5.23 b-e
GC 271	28.5 d-i	22.1 gh	1.30 abc	3.8 b-e	0.96 abc	4.90 c-f
SG 501	29.1 c-i	24.8 a-h	1.18 a-e	4.8 ab	0.85 abc	4.40 fg
SG 180	27.8 ghi	23.5 e-h	1.20 a-d	3.8 b-e	0.93 abc	4.98 c-f
DP 5409	29.1 c-i	27.5 ab	1.08 de	4.4 abc	0.98 abc	4.04 g
MAXXA	29.9 b-i	24.6 a-h	1.23 a-d	5.1 ab	0.87 abc	5.88 b
DP 50	27.5 hi	24.4 b-h	1.15 b-e	.0 ab	0.97 abc	4.52 fg
GC 120	28.6 d-i	26.3 a-e	1.10 de	4.4 bcd	1.03 abc	4.48 fg
STV 132	28.1 e-i	22.9 fgh	1.20 a-d	2.8 e	0.71 c	5.34 bcd
1517-91	31.1 a-g	24.9 a-h	1.25 a-d	3.8 b-e	1.08 abc	4.88 c-f
HS 26	28.9 d-i	25.8 a-f	1.10 de	4.1 b-e	0.97 abc	5.46 bc
Average	30.2	25.1	1.21	4.0	1.00	4.85
LSD(05)	3.0	2.6	0.15	1.1	0.4	0.5
CV(%)	7.0	7.4	9.2	20.4	27.3	7.9

Table 3. HVI data from the Regional Short Staple Variety Trial, Safford Agricultural Center, 1997.

Variety	Length	Uniformity	Strength	Elongation	Micronaire	RD	+b	C Grade
MAC 95	1.10	81.1	36.7	9.5	4.4	77.0	8.6	31-2 31-3
SG 1001	1.07	80.3	28.8	9.9	4.6	77.0	8.5	31-1
DP 90	1.08	80.4	25.7	9.9	4.6	76.3	7.8	31-2 41-1
DP 35B	1.06	81.5	28.3	9.7	4.8	77.0	8.3	31-1 31-2
HYX 4103	1.07	81.8	28.0	10.5	4.8	75.7	8.1	31-1 31-4
GC 303	1.06	79.6	25.3	10.0	4.5	75.7	8.0	31-2 41-1
HS 44	1.03	78.6	24.3	9.9	4.9	76.4	9.0	31-1 31-3
SG 821	1.04	82.1	25.7	11.0	4.7	76.0	9.0	31-3 31-4
SG 248	1.08	80.9	26.5	9.8	4.7	77.4	8.0	31-1 31-2
STV 474	1.03	82.2	24.7	10.0	4.4	73.6	8.7	41-3
SG 125	1.06	81.6	22.6	10.0	4.5	75.8	8.9	31-3 31-4
LA 887	1.09	81.3	27.3	9.9	4.6	74.0	8.8	31-4 41-3
SG 404	1.04	82.0	24.9	9.7	4.7	74.7	8.7	31-4 41-3
BXN 47	1.03	81.8	24.0	9.4	4.2	72.9	9.2	31-4 41-3
1517-95	1.12	81.3	29.0	9.7	4.0	73.4	8.3	41-1 41-4
GC 271	1.11	82.0	27.0	9.7	4.3	73.1	7.4	41-2
SG 501	1.05	81.7	28.2	10.0	4.3	73.5	8.2	41-2 41-3
SG 180	1.09	81.0	27.7	9.5	4.4	75.4	7.6	31-2 41-1
DP 5409	1.07	81.2	25.7	9.9	4.0	75.8	7.9	31-2 41-1
MAXXA	1.10	82.2	29.3	9.3	3.9	74.4	7.9	41-1 41-2
DP 50	1.08	80.8	22.8	9.9	4.4	76.8	7.7	31-1 41-1
GC 120	1.05	82.8	24.7	9.9	3.6	75.8	7.8	41-1
STV 132	1.01	81.5	25.5	9.8	3.9	76.1	7.8	31-2 41-1
1517-91	1.12	83.0	28.9	9.5	4.0	73.5	7.9	41-1 41-4
HS 26	1.02	81.5	26.9	10.0	4.5	75.6	8.1	31-2 41-3
Average	1.07	81.4	26.7	9.9	4.4	75.3	8.2	--