

Short Staple Variety Trials in Cochise County, 1994

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Abstract

Variety trials were grown at two locations and with two different sets of short staple varieties. One trial on the Robbs farm, north of Kansas Settlement, tested eight acala varieties from New Mexico and California. The other trial on the Curry farm, southwest of Kansas Settlement and north of Sunsites, tested twelve upland varieties as part of the statewide testing program. The latter trial was grown under drip irrigation. Yields were exceptionally high at these high elevation trials due to the record breaking heat experienced during the summer. Top yielding varieties were Prema in the acala trial and DP 5409 in the upland trial with lint yields of 892 and 1791 pounds per acre, respectively.

Introduction

Two variety trials were conducted in Cochise county this year, one made up primarily of acala varieties, to be a sister trial to the one in Greenlee county (reference 1), the other made up of varieties from the six seed companies that sponsored variety testing across the state. All of the varieties in the acala trial had been tested in previous trials, whereas in the upland trial, most of the varieties were new to the area.

Materials and Methods

The upland variety trial was planted on a drip irrigation field on the Ed Curry farm just north of Sunsites and the acala trial was planted on the Robbs farm north and east of Kansas Settlement. Both trials were planted using the cooperators equipment and managed according to their cultural practices. The Robbs field was planted using a 2:1 skip pattern. The varieties were planted in two row plots the full length of the respective fields, with two replications being harvested. The following crop histories provide details on how the fields were managed:

Crop History - Curry farm

Previous crop: Fallow

Soil type: Tubac sandy clay loam

Planting date: 22 April 1994 Rate: 26 lbs/ac

Fertilizer: 30 gal/ac of UN32 applied through the drip (equally divided into 3 applications) [~ 106 lbs of N/ac]

Herbicide: Treflan pre-plant

Insecticide: None

Fungicide: None

Pix/Prep: None

Defoliation: None

Irrigation: Drip tape every other furrow (60" centers), ca. 20 acre inches of water

Harvest date: 2 December

Crop History - Robbs farm

Previous crop: Cotton
Soil type: Karro-Elfrida sandy loam
Planting date: 8 April 1994 Rate: 17 lbs/ac
Fertilizer: 80 lbs/ac of N sidedressed
Herbicide: Treflan pre-plant
Insecticide: Thimet applied in the seed bed
Fungicide: None
Pix/Prep: None
Defoliation: None
Irrigation: Furrow, watered up + 4-5 irrigations (ca. 38 acre inches)
Cropping pattern: 2 - 1 skip pattern (40" rows)
Harvest date: 26 October

On the Robbs farm the plots were picked using the cooperators equipment and each individual plot was weighed using electronic weigh scales under cotton trailers. The Curry trial was picked with a single row International cotton picker and weighed in a manner similar to the Robbs plots. Approximately 8 pound grab-samples were taken from each plot and ginned to determine percent lint turnout, then sub samples were taken for HVI analysis.

Results and Discussion

Yields and other agronomic variables for the acala trial are shown in Tables 1a. Prema was the top yielding variety in 1994 with a yield of 892 pounds of lint per acre. Maxxa, the top yielding variety in both Greenlee and Cochise counties in 1993 (2,3), came in next to last in seedcotton but fourth in lint yield. New Mexico 1517-88, came in third in seedcotton and a strong second in lint yield, followed by New Mexico's newest variety, 1517-95, and 1517-91, the best average yielder in Greenlee county. The plant population was quite low in our test plots on the Robbs farm and may have limited yields. The height to node ratios (HNR) varied among varieties, from 1.40 to 1.75, all falling in the middle of the range of HNR values for full season upland varieties according to Silvertooth, et.al. (4). The variability between varieties is genetic, but the fact that they fell in the middle of the range would indicate that cultural practices and climatological conditions were not obviously limiting.

Yields and other agronomic variables for the upland cotton variety trial on the Curry farm are shown in Tables 1b and 1c. This plot was unique in Cochise county, being part of the first drip irrigated cotton planted in the county. Some difficulties were experienced in planting the field since the drip lines had just been installed and the field was dry powder about 6 inches deep. The initial planting attempt was aborted until the soil could be moistened to firm the beds and allow more precise planting to take place. Because of this set back the plant populations were not as consistent as they could have been, but, not-with-standing, excellent yields were seen. DP 5409, the top yielding variety yielded over to 3.5 bales per acre of lint and five of the other varieties yielded over 3 bales per acre. A look at the HNR's shows that these values were in the upper part of the acceptable range from Silvertooth's work (4). An additional column is included in Table 1c that justify explanation. The nodes to first fruit column shows that fruit was set very early on the plants and that fruit was harvested. More typical values would be 7 to 8 nodes, unfortunately hard data from adjacent crops were not obtained for comparison.

HVI data for the two trials are included in Tables 2a and 2b. All of the varieties in the Robbs trials had excellent fiber, as was expected from acala cottons. Average lengths were 1.185 inches (between 37 and 38 staple) and average strength of 34.4. The surprise came from the Curry trial, the average length was 1.196 inches (between 38 and 39 staple) and a strength of 29.4. The strength was not quite up to acala level, but the lengths were greater. It seems as though the stress free growth that elongated the internodes and gave higher HNR's also gave longer staple length. Additional information will be gained in future investigations.

References

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Table 1a. Yield and other agronomic data for the acala cotton variety trial conducted on the Robbs farm in Cochise county, 1994.

Variety	Seedcotton Yield	Percent Lint	Lint Yield	Plant Height	Plants per acre	Nodes	Height to Node ratio
Prema	2626 a*	34.0 c	891.7 a	32.8 ab	14898 a	20.8 ab	1.58 abc
1517-91	2551 a	33.1 c	834.6 ab	34.5 ab	15510 a	21.5 ab	1.58 abc
1517-88	2507 ab	34.7 bc	870.0 a	36.3 a	15715 a	20.8 ab	1.75 a
1517-95	2499 abc	33.7 c	840.4 ab	35.3 ab	13470 a	21.3 ab	1.67 ab
1517-E2	2383 abcd	34.0 c	810.1 ab	34.0 ab	14694 a	22.3 ab	1.54 bc
Royale	2277 bcd	36.4 ab	828.0 ab	32.5 ab	11021 a	21.8 ab	1.49 bc
Maxxa	2247 cd	37.4 a	838.8 ab	30.8 b	15102 a	19.8 b	1.56 abc
1517-SR3	2166 d	34.3 bc	741.9 b	33.3 ab	12449 a	23.8 a	1.40 c
Average	2407.1	34.7	833.1	33.7	14107.4	21.5	1.57
LSD(05)	237.7	2.03	95.8	4.41	5715.1	3.53	0.019
CV(%)	4.17	2.48	4.86	5.54	17.13	6.96	5.12

* Values followed by the same letter, within columns are not significantly different at the 5% level of probability.

Table 1b. Yield and other agronomic data for the upland cotton variety trial conducted on the Curry farm in Cochise county, 1994.

Variety	SC Yield	Percent Lint	Lint Yield	Plant Height	Plants per acre
DP 5409	5120.3 a*	34.9 a	1790.8 a	33.0 d	33759 ab
SG 404	4908.1 ab	33.0 a	1619.4 ab	34.5 cd	35393 ab
CB 1210	4838.2ab	33.9 a	1635.4 ab	40 ab	23686 b
Mycogen 1185	4690.6 ab	34.5 a	1622.9 ab	42.0 a	28042 ab
Mycogen 2006	4661.8 ab	33.2 a	1559.9 ab	41.0 ab	40021 ab
HY 39	4520.2 ab	32.4 a	1461.5 ab	42.0 a	34848 ab
SGX 223	4414.4 ab	35.7 a	1572.3 ab	32.0 d	69152 a
HS 23	4344.2 abc	33.2 a	1440.0 ab	34.0 cd	43016 ab
CB 232	4262.3 abc	31.9 a	1358.5 ab	37.0 bc	46010 ab
1517-95	3888.0 abc	32.3 a	1256.7 ab	43.5 a	52272 ab
DP 20	3675.3 bc	32.0 a	1176.1 b	33.0 cd	37289 ab
STV 132	3069.2 c	35.1 a	1075.7 b	28.0 e	25047 b
Average	4366.0	33.48	1464.8	36.67	39045.2
LSD(05)	1182.1	3.99	513.4	3.92	38816.1
CV(%)	12.3				

* Values followed by the same letter, within columns are not significantly different at the 5% level of probability.

Table 1c. Other agronomic variable measured or calculated from the cotton variety trial on the Curry farm in Cochise county, 1994.

Variety	Nodes	Height to Node Ratio	Nodes to 1st Fruit
DP 5409	21.6 a*	1.56 e	5.0 c
SG 404	20.3 abc	1.77 cde	6.5 ab
CB 1210	22.9 a	1.96 abc	5.0 c
Mycogen 1185	22.8 a	1.88 bcd	6.0 b
Mycogen 2006	20.3 abc	2.13 ab	6.0 b
HY 39	20.9 ab	2.21 a	7.0 b
SGX 223	18.4 bc	1.92 bcd	5.0 c
HS 23	20.3 abc	1.67 de	4.5 c
CB 232	20.1 abc	1.88 bcd	6.5 ab
1517-95	22.1 a	2.06 ab	5.0 c
DP 20	21.5 a	1.71 cde	6.5 ab
STV 132	17.6 c	1.69 cde	5.0 c
Average	20.72	1.87	5.67
LSD(05)	2.55	0.25	0.73
CV(%)	10.12	11.38	5.88

* Values followed by the same letter, within columns are not significantly different at the 5% level of probability.

Table 2a. HVI data for the acala cotton variety trial conducted on the Robbs farm in Cochise county, 1994.

Variety	Length (in)	Uniformity	Strength	Elongation	Micronaire	Grade
Prema	1.20	85.5	35.8	6.3	3.7	21/31
1517-91	1.20	85.8	34.6	6.4	4.4	31
1517-88	1.18	85.5	32.3	6.2	3.8	21
1517-95	1.20	85.7	34.4	6.2	4.2	21/31
1517-E2	1.18	85.2	35.1	6.2	3.9	21/31
Royale	1.17	84.9	33.4	6.3	4.2	21/31
Maxxa	1.16	85.3	33.7	6.0	4.1	21
1517-SR3	1.19	85.2	36.1	6.5	4.0	31
Average	1.185	85.39	34.43	6.26	4.04	--
Std Dev	0.014	0.276	1.187	0.141	0.218	

Table 2b. HVI data for the upland cotton variety trial conducted on the Curry farm in Cochise county, 1994.

Variety	Length (in)	Uniformity	Strength	Elongation	Micronaire	Grade
DP 5409	1.17	84.9	27.2	6.5	3.7	11
SG 404	1.19	85.2	29.1	6.7	4.5	31
CB 1210	1.17	85.4	31.3	6.5	3.6	21
Mycogen 1185	1.23	86.7	31.4	6.6	3.8	31
Mycogen 2006	1.22	86.4	29.5	6.5	3.6	21
HY 39	1.22	86.4	30.3	6.5	3.4	31
SGX 223	1.23	86.0	31.3	6.5	4.5	32/41
HS 23	1.2	85.4	28.9	6.4	3.7	21/31
CB 232	1.18	85.5	26.9	6.7	3.9	21/31
1517-95	1.23	86.5	32.2	6.7	3.5	31
DP 20	1.18	85.1	26.9	6.9	3.4	21
STV 132	1.13	84.4	27.5	6.7	3.5	21
Average	1.196	85.66	29.38	6.6	3.76	--
Std Dev	0.031	0.73	1.93	0.14	0.38	--