Short Staple Variety Trials in Cochise County, 1997

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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 one acala variety from New Mexico two varieties from Australia and SureGrow 125, the highest yielding variety in Curry trial in 1996. The other trial on the Ed Curry farm, near Sunsites, tested twelve upland varieties as part of the statewide testing program. The highest yielding variety in the Robbs trial was SG 125 with a yield approaching 1.7 bales per acre. In the Curry trial, SureGrow 404, the highest yielding variety in the 1995 trial, had the highest yield approaching 2.5 bales per acre.

Introduction

Two variety trials were conducted in Cochise county this year, one made up primarily to compare the predominant acala variety with other potential varieties in the area, to be a sister trial to the one in Greenlee county (reference 1), the other made up of varieties from six seed companies as a part of the statewide variety testing program. Five of the varieties tested in the two trials were new to the area.

Materials and Methods

The upland variety trial was planted on a drip irrigated field on the Ed Curry farm 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 varieties were planted in two row, 38 inch row spacing plots on the Robbs farm with a 4X1 skip pattern and four-row 30 inch row spacing plots on the Curry farm. There were four replicates on the Robbs farm and two replications on the Curry farm. The following crop histories provide details on how the fields were managed:

Crop History - Robbs farm

Previous crop: Lettuce
Soil type: Karro-Elfrida sandy loam
Planting date: 21 April 1997 Rate: 17 lbs/ac
Fertilizer: 30 gal/ac 10-34 at planting + 20 gal/ac of UN32 in July
Herbicide: Treflan pre-plant
Insecticide: Thimet applied in the seed bed
Fungicide: None
Pix/Prep: None
Defoliation: None
Irrigation: Furrow irrigated, watered up + 4-5 irrigations
Harvest date: 7 November
Heat units (86/55°F) to harvest: 3203 as calculated from data at the Bonita AZMET station.

Crop History - Curry farm

Previous crop: Chile pepper

Soil type: McAllister loam
Planting date: 21 April 1997 Rate: 20 lbs/ac
Fertilizer: 150 lbs/ac 11-53-0 preplant
Herbicide: Treflan pre-plant
Insecticide: None
Fungicide: None
Pix/Prep: None
Defoliation: None
Irrigation: Buried drip irrigation
Harvest date: 10 November
Heat units (86/55°F) to harvest: 3215 as calculated from data at the Bonita AZMET station.

On the Robbs farm the plots were picked using the cooperator's equipment and each individual plot was weighed using electronic weigh scales under cotton trailers. The Curry trial was picked with a 4-row John Deere cotton picker and weighed in a basket scale, which dumped the cotton into a module builder. Approximately 4 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

1997 was a year with some challenges. March weather was beautiful with no frosts after the 5th of the month, but April had frosts on the 4th, 7th, 8th, 13th, 14th and 25th. It wasn't until about the 28th when the weather was hospitable for cotton growth. Then it dropped into the 40's 8 days in May with the average low temperature for the month being 51 degrees the average high was 86°F. Then in the fall, It dropped to 33°F on the 13th of October (in Bonita) and to 31°F on the 25th. That, along with the nights that followed, ended the cotton season. So, the cotton season was a bit short. The two sites are distinct from a microclimate stand point, with the Sunsites location being somewhat of a "banana belt" because of its early morning exposure to the sun and a good slope for cold air drainage. This improved microclimate along with the drip system helped yields considerably.

The Australian variety, IF 1001 had the highest yield both this year and last in the Robbs study (Table 1). Both Australian varieties had lint turnouts statistically higher than the other varieties. Table 1b shows that the Australian varieties were taller, and had more nodes than the other two varieties, but the Height to Node Ratios (HNR) were lower than the other varieties. They also tended to fruit at higher nodes than the other varieties. Table 2 show the lint qualities as presented from High Volume Instrumentation (HVI). The New Mexico acala, 1517-91, had the superior fiber, but IF 1001 showed good strength and uniformity and its micronaire value was a bit higher. The New Mexico experimental, B5008, which showed good last year was not placed in this year's trial because of lack of seed.

Yield data for the trial on the Curry farm are found in Tables 3a and 3b. In spite of a marginal season, SG 404 managed to yield nearly 2.5 bales of lint per acre. DP 50 and SG 125 were close behind with around 2 1/4 bales. DP 50 lint yield was hurt by its low lint turnout. The average plant population was fairly good but dramatic differences were seen throughout the field. Part of the differences seen were due to varietal differences, the other part was due to seed line location with respect to the drip tape. As is typical with cotton grown under drip irrigation in this location, some plants grew very tall. It is interesting to note, though, that the growth didn't delay fruiting. They started about the 6th node and fruited to the top. Number of nodes were high as were the HNR values. The latter indicates a vigorously growing plant. Table 4 shows the HVI values for the lint. The HS and HYX varieties all showed good length and strength. Grades across the board were excellent even though the leaf trash grade was a bit high. Leaf grade and trash were high because of the lush growth of the plants and the fact that they were not defoliated.

References

1. Clark, L.J. 1997. Short staple variety trials in Cochise county, 1996. Cotton, A College of Agriculture

Table 2. HVI data for the acala cotton variety trial conducted on the Robbs farm in Cochise county, 1997.

Var	Color Grade	Leaf Grade	Mic	Length (in)	Strength (g/tex)	Unif	% Trash	RD	+B
IF 1001	11/21	2	4.0	1.12	32.2	82.5	6.0	80.0	95.5
SG 125	12/22	2	3.6	1.13	27.4	81.0	4.0	77.0	108.5
1517-91	21/22	3	3.8	1.15	31.9	82.5	4.5	77.0	103.5
IF 1004	12	2	2.9	1.13	29.8	80.5	4.0	76.5	1.12
AVG	--	2.3	3.8	1.13	30.3	81.6	4.6	77.6	104.8
LSD(05)	--	--	3.1	0.01	4.4	1.2	3.1	1.6	1.5
CV(%)	--	--	5.0	0.6	9.2	0.9	41.2	1.3	0.9

Table 3a. Yield and other agronomic data for the acala cotton variety trial conducted on the Curry farm in Cochise County, 1997.

Variety	SC YLD	% TURNOUT	LINT YLD	Pl/Ac
SG 404	3526.7 a	35.0 bc	1234.2 a	44013.8 bc
DP 50	3548.1 a	32.0 d	1135.7 ab	48551.3 bc
SG 125	3152.8 ab	36.0 ab	1135.0 ab	72146.3 ab
STV 132	2957.7 abc	38.0 a	1120.5 ab	38115.0 c
IF 1004	2798.4 abc	36.8 ab	1029.9 abc	42198.8 c
IF 1001	2787.3 abc	36.8 ab	1023.6 abc	63071.3 abc
DP 5409	2863.7 abc	35.8 ab	1018.8 abc	79406.3 a
HS 22	3083.5 abc	32.5 cd	1005.6 abc	58987.5 abc
STV XM002	2577.8 abc	36.8 ab	948.3 abc	42198.8 c
HS 12	2372.2 bc	33.0 cd	787.2 bc	64432.5 abc
HYX 4103	1971.5 c	33.0 cd	652.9 c	58987.5 abc
HS 44	1967.6 c	33.0 cd	647.6 c	48097.5 bc
Average	2800.6	34.9	978.3	55017.2
LSD(05)	1052.7	2.5	377.9	26115.6
CV(%)	17.1	3.2	17.6	21.6

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

Report, The University of Arizona, Tucson, AZ. Series P-108, pp. 143-148.

2. Clark, L.J. 1998. Short staple variety trial, Greenlee county, 1997. In this volume.

3. Brown, P. Et.al. AZMET weather system. Http://ag.arizona.edu/azmet/

Acknowledgment

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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, 1997.

Variety	SC YIELD	% TURNOUT	LINT YIELD	Pl/Ac
IF 1001	2279.6 a[1]	37.3 a	849.2 a	39022.5 a
SG 125	2184.2 a	35.8 b	780.9 a	31535.6 a
1517-91	1815.8 b	35.5 b	644.6 b	31762.5 a
IF 1004	1651.4 b	37 a	611 b	30628.1 a
Average	1982.7	36.4	721.4	33237.1
LSD(05)	229.2	1.1	83.7	10930.1
CV(%)	7.2	1.9	7.3	20.6

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

Table 1b. Continuation of Table 1a with data from the Robbs farm in Cochise County, 1997.

Variety	Pl/Ht	NODES	HNR	1st Frt Branch	Boll Weight
IF 1001	39.6 a[1]	23.4 a	1.7 b	7.8 a	6.68 b
SG 125	37.6 ab	18.8 b	2.0 a	6.3 a	6.83 b
1517-91	35.1 b	19 b	1.8 ab	6.9 a	7.13 a
IF 1004	40.1 a	23.8 a	1.7 b	7.3 a	6.13 c
Average	38.1	21.2	1.8	7.0	6.69
LSD(05)	4	2.2	0.28	1.5	3.0
CV(%)	6.6	6.5	9.5	13.1	2.8

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

Table 3b. Continuation of Table 2a with data from the Curry farm in Cochise County, 1997.

Variety	Pl/Ht	1st Fruit Branch	Nodes	HNR
SG 404	38.3 cd	4.5 bc	21.5 ab	1.8 bcd
DP 50	43.8 a-d	5.8 abc	24.8 ab	1.8 bcd
SG 125	38.5 cd	6.0 abc	21.3 ab	1.8 bcd
STV 132	31.0 d	6.0 abc	19.0 b	1.7 d
IF 1004	52.3 abc	7.8 a	24.3 ab	2.2 ab
IF 1001	47.3 abc	6.8 a	26.8 a	1.8 bcd
DP 5409	40.5 bcd	6.5 ab	23.5 ab	1.7 cd
HS 22	44.3 a-d	6.3 abc	24.0 ab	1.9 bcd
STV XM002	47.5 abc	4.3 c	20.8 ab	2.3 a
HS 12	56.3 a	6.0 abc	26.5 a	2.1 abc
HYX 4103	53.5 ab	7.5 a	24.8 a	2.2 ab
HS 44	55.3 a	6.0 abc	27.3 a	2.0 a-d
Average	45.7	6.1	23.7	1.9
LSD(05)	12.8	1.9	5.9	0.38
CV(%)	12.7	14.0	11.3	9

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

Table 4. HVI data for the upland cotton variety trial conducted on the Curry farm in Cochise county, 1997.

VAR	C GRADE	LF GRADE	MIC	LEN (IN)	STR	UNIF	TRASH	COLOR	RD	+B
SG 404	21	3.5	3.4	1.15	27.9	81.0	6.0	11-2 21-3	79.5	93.0
DP 50	11/21	3.5	3.4	1.16	26.0	81.0	5.5	11-2 21-2	80.0	88.0
SG 125	11	3.0	3.4	1.15	25.0	81.5	7.0	11-2	80.0	92.5
STV 132	21	3.5	3.8	1.06	25.5	80.5	12.0	21-1 21-2	80.5	81.0
IF 1004	21	3.5	3.0	1.15	27.9	79.5	5.0	21-1	81.0	81.5
IF 1001	21	3.5	3.8	1.14	28.8	81.5	8.0	11-2 21-2	81.5	82.5
DP 5409	21	3.5	3.1	1.14	25.8	79.5	4.5	21-1	81.0	81.5
HS 22	21	3.5	3.1	1.16	26.7	80.0	10.5	21-2	78.5	87.5
STV XM002	21	4.0	3.7	1.12	27.2	81.0	7.0	21-2	78.5	92.0
HS 12	21	3.5	3.1	1.15	28.0	80.0	7.5	21-1 21-2	79.5	83.0
HYX 4103	21	3.0	3.5	1.17	29.4	80.0	6.0	21-1 21-2	79.5	89.0
HS 44	21	4.0	3.1	1.17	28.6	79.5	6.0	21-2	79.0	86.0
AVG	--	3.5	3.3	1.14	27.1	80.4	7.1	--	79.9	86.5
LSD	--	1.3	0.7	0.04	2.0	2.3	7.1	--	--	7.7
CV	--	16.9	9.9	1.8	3.4	1.3	45.8	--	--	4.1