

Short Staple Variety Trial, Greenlee County, 1998

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Abstract

Six short staple cotton varieties including two New Mexico acalas varieties and one advanced strain, an Australian varieties and two SureGrow varieties with higher yield potential were tested in this study. New Mexico Acala 1517-95 had the highest lint yield with a yield of 419 pounds of lint per acre. The average yield was about 400 pounds per acre lower than the 6 year average due to a cold spring and a four inch rain that fell in one hour in the middle of July. In addition to lint yields; percent lint, plant heights, plant populations and lint hvi values are shown. A lint yield comparison for 1993 through 1998 is included in this paper.

Introduction

This experiment and a sister experiment in Cochise county are a continuation of varietal evaluations on the acala varieties that grow in the high deserts of Arizona and New Mexico. The current New Mexico 1517 acalas and the advanced strains that are near approval are the backbone of the trial with Australian and SureGrow varieties included to see if they would be beneficial to local growers.

Methods and Materials

The varieties were planted in two row plots in four replications on the Stan Jones farm in Virden, NM, using their equipment and normal cultural practices. The crop history listed below outlines the important things that took place during the growing season.

Crop History - Jones farm

Previous crop: Grain sorghum

Soil type: Pima sandy loam

Planting date: 30 April 1998

Rate: 17 pounds per acre

Fertilizer: 200 lbs/ac anhydrous ammonia

Herbicide: Treflan and caparol

Insecticide: None

Pix/Prep: None

Defoliation: None

Irrigation: Furrow

Harvest date: 27 November

Heat units (86/55) to hard frost (11/10): 3567 at the Safford Agricultural Center adjusted to 3114 for Duncan.

Adjustment factor of 0.873 calculated from Brown (1) HU data for Safford and Duncan.

Plots were mechanically picked using the cooperator's machines, with plots being weighed using a basket scale and then dumped into a module builder. Sub-samples were taken to determine lint turnout and fiber quality.

Results and Discussion

The spring of 1998 was cold and planting dates were pushed back to wait for the soil to warm up. Daily heat units continued to vary through May before settling down near the normal values. Heat units, however, were not the most important factor in cotton yields in the Duncan-Virden valley in 1998. A violent storm in the middle of July dumped four inches of rain in about an hour's time, with some of the precipitation coming in the form of hail. Cotton plants were beaten to the ground and the terminals of many plants were destroyed. The plants grew back and produced as much fruit as possible, but yield potentials were greatly diminished. Because of the damage to the plants and the yield, minimal measurements were taken. Varieties from all four replicates were harvested as one rep. This eliminated the possibility of statistical analysis on the variables measured.

The yields are shown in Table 1. New Mexico Acala 1517-95 produced the highest yield, producing 419 pounds of lint per acre. The percent lint turnouts were determined on a small research gin which produced results considerably higher than the commercial gins in the area, but the important point to note is that the lint turnouts were all close to one another. It is interesting to note that the experimental New Mexico acala, NM 8073, had a slightly higher lint turnout than the other varieties in the trial. This variety was also the tallest variety in the trial. The plant populations were fairly close to one another and in the optimal range between 25,000 and 50,000 plants per acre. Boll weights were heavy, considerably heavier than the previous year (2). It is interesting to note that 1517-95, which had the heaviest boll in this study, also had the heaviest boll weight last year.

It is interesting to compare this trial with the sister trial grown in Cochise county (3). The Cochise county trial was also affected by hail in 1998 and the yields were suppressed even lower than in this trial. The yield order was completely different from the Greenlee county study, as were most of the other parameters measured. It seems that this year the only thing the two studies had in common was the list of varieties. Soil, climate and management all varied greatly.

Table 2 contains the HVI (High Volume Instrument) values for the lint. The samples were very leafy and since our small research gin didn't have the capacity to remove leaf trash, this led to poor color and leaf grades. Micronaire values were lower than last year, but only one, IF 1001, was low enough to receive a discount. Fiber length and strength were good. The experimental acala from New Mexico, NM 8073, had the best length and strength in the trial. It is also worthy to note that the Australian variety, IF 1001, has a quality very close to the New Mexico acalas.

Table 3 contains a six year yield summary of varieties. Some varieties were only evaluated in high yielding years, so an average lint yield has limited value. Instead a Weighted Rating is supplied in the last column to try to correct this problem. This weighted rating is calculated by taking the average lint yield of a variety and dividing that number by the average of the average yields for the years when that variety was grown. Using that weighted rating, one would assume that NM 8073 is the strongest variety because it has the highest rating. Caution must be exercised with this assumption since that variety has only been seen once in our trials. IF 1001 and B 5008 are the next highest in the rating scale, but they only yielded higher than 1517-95 and 1517-91 in one of the two or three years that they were compared against 1517-95 and 1517-91, so there is not a compelling reason to discard the old stand-by varieties with something new.

References

1. Brown, Paul W. 1991. Normal values of heat unit accumulation for southern Arizona. Extension Report 190041, May 1991.
2. Clark, Lee J. 1998. Short staple variety trial, Greenlee county, 1997. Cotton, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-112, pp. 124-127.
3. Clark, L.J. 1999. Short staple variety trials in Cochise County, 1998. In this publication.

Acknowledgments

Appreciation is expressed to Stan Jones and John Swapp for their interest and cooperation in this study. Seed was provided by New Mexico Crop Improvement, Australian Cotton Seed Distributors and SureGrow.

Table 1. Yield and other agronomic data for the upland cotton variety trial grown on the Jones/Swapp farm, Virden, NM, 1998.

Variety	SC Yield	% Lint	Lint Yield	Plant Ht	Pl/ac	Boll Wt
1517-95	1060.4	39.51	419.0	36.0	33495	6.85
NM 8073	965.0	40.91	394.8	37.0	37789	6.15
1517-91	951.9	39.86	379.4	34.5	39506	6.05
SG 404	904.7	38.11	344.8	28.0	42942	5.80
IF 1001	780.5	39.16	305.6	33.0	32120	5.60
SG 125	694.0	39.16	271.8	28.0	42942	5.75
Average	892.8	39.45	352.6	32.8	38132.2	6.03

Table 2. HVI data from the upland cotton variety trial grown on the Jones/Swapp farm, Virden, NM, 1998.

Variety	Color Grade	Leaf Grade	Mic	Length (in)	Strength (g/tex)	Unif	% Trash	RD	+B
1517-95	42	8	39	118	29.5	83	15	71	85
NM 8073	52	8	36	124	30.7	84	21	70	77
1517-91	52	8	41	122	29.5	82	18	69	80
SG 404	42	8	35	114	27.6	82	13	72	80
IF 1001	52	8	32	119	28.8	84	16	73	66
SG 125	41	8	37	114	25.2	82	15	74	75
Average	46.8	8.0	36.7	118.5	28.6	82.8	16.3	71.5	77.2

Table 4. Lint yield comparisons by variety over 6 years on the Jones farm in Virden, NM.

Variety	Lint Yld 1993	Lint Yld 1994	Lint Yld 1995	Lint Yld 1996	Lint Yld 1997	Lint Yld 1998	Weighted Rating
1517-95	738 ab ¹	895 ab	1030 a	805 b	796.0	419.0 ²	1.001
1517-91	741 ab	1009 a	1020 a	842 b	727.0	379.4	1.009
Maxxa	832 a	924 ab	960 a	--	--	--	1.022
1517-88	662 b	870 ab	954 a	--	--	--	0.935
IF 1001	--	--	--	1013 a	791.0	305.6	1.045
B 5008	--	--	--	940 a	795.0	--	1.041
IF 1002	--	--	--	820 b	--	--	0.928
IF 1004					706.0	--	0.903
SG 125					875.0	271.8	1.011
B 8073						394.8	1.120
SG 404						344.8	0.978
Average	743.3	924.5	991	884	781.6	352.6	--
LSD(05)	105.1	170.7	105.9	76.8	77.7	--	--
CV(%)	17.1	8.55	4.63	4.06	3.9	--	--
Heat Units (86/55°F)	3257	3292	3347	3397	3260	3114	--

1. Lint yields in 1993 were calculated from seed cotton yields using a 35% turnout for all varieties.

2. Lint Yields in 1998 were seriously affected by hail and a 4 inch rain storm that occurred in one hour in the middle of July.