

Short Staple Variety Trials, Graham County, 1997

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Abstract

Two on-farm, replicated short staple variety demonstrations were planted in 1997. Twelve varieties were evaluated on the Carpenter farm in Central and on the Colvin farm in Eden. Several new varieties were planted in both studies, including 2 transgenic varieties, DP 35B and BXN 47, 2 varieties from Australia and four other varieties seen for the first time. DP 35B and Stoneville 474 were the highest yielding varieties in Central and the Australian variety, IF 1003, had the highest yield in Eden with yields over 2 bales per acre. Other agronomic data from the varieties and HVI values from the lint are also included in this report.

Introduction

This cotton variety trial, similar to the previous year's studies, is part of state-wide variety evaluation done in conjunction with Dr. Jeff Silvertooth and six seed companies. But, even more important, it is part of the on-going variety trials conducted in the county for the benefit of local cotton growers.

Materials and Methods

The demonstrations were grown with the cooperation of Darin Carpenter in Central, at an elevation of 2900 feet, and Colvin Farms in Eden, at an elevation of 2800 feet, using their equipment and normal cultural practices. The two sites differ in elevation by about 100 feet with the Carpenter field being higher and generally warmer. The varieties were planted in 2-row plots in four replications at the Carpenter site and 4-row plots with three replicates on the Colvin site. Plots were mechanically picked using the cooperators' machines, with each plot being weighed separately using electronic weigh scales under cotton trailers. Sub-samples were taken to determine lint turnout and fiber quality.

Crop History - Carpenter farm

Previous crop: --
Soil type: Pima clay loam/Grabe clay loam
Planting date: 17 April 1997 Rate: 26 pounds per acre
Fertilizer: 30 gallons of 20-10-0 side dressed late May
Herbicide: None
Insecticide:
Irrigation: Furrow, 7 times
Defoliation: Sodium chlorate
Harvest dates: 1st Pick: 29 October 2nd Pick: Not taken
Heat units (86/55) to 1st pick: 3786

Crop History - Colvin farm

Previous crop: Cotton

Soil type: Grabe clay loam
Planting date: 2 May 1997 Rate: 20 pounds per acre
Fertilizer: 40 pounds of N water run
Herbicide: Treflan and caparol incorporated pre-plant
Insecticide: None
Defoliation: Sodium chlorate
Irrigation: Furrow
Harvest dates: 1st Pick: 17 November 2nd Pick: Not taken
Heat units (86/55) to 1st pick (recorded at Safford Ag Center): 3702

Results and Discussion

The weather plays a significant part in the yield of cotton and also which variety does best in what location. The months of April and May are pivotal to stand establishment. The total number of heat units received in 1997 was very comparable to those received in 1996 (1, 2) and temperatures were normal (compared to a 30 year average up to the end of March (3)). From the second week in April to the middle of May heat units were 1 to 2 days behind normal and it was observed that stand establishment was delayed especially west of Pima. Beginning the middle of May, the temperatures rose and the heat units ran ahead of normal.

Tables 1a and 1b show the yield and other agronomic data from the Carpenter trial. Yields were considerably lower than the previous year and only two varieties yielded over 2 bales per acre. DP 35B, the transgenic version of DP 5690, produced the highest yield with Stoneville 474 very close behind.

HVI analyses on the subsamples taken from the Carpenter field are listed in Table 3a. Grades were very good even though most HVI values were not as good as the previous year. HS 12 and HS 22, two of the new varieties being tested had the longest fiber with length reaching 1.17 to 1.18 inches

The results of the Colvin trial are found in Tables 2a and 2b. The Australian variety, IF 1003, was the highest yielding variety in the trial. This variety was the highest yielding non-transgenic variety in the short staple advanced strains trial (4) as well as in the highest yielding Australian variety in last year's advanced strains trial (5). The new variety HYX 4103 and DP 35B were next in line for yield.

Boll samples were taken from first position locations in the center of plants to determine an average boll weight.

The HVI results from the Colvin trial are found in Table 3b. The average quality of fiber was worse than last year. The longest fiber came from HS 12, but the average fiber length was higher than that of DP 90.

References

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3. Brown, P. et.al. 1998. 1997 Cotton advisories. [Http://ag.arizona.edu/azmet/data/0497cot.txt](http://ag.arizona.edu/azmet/data/0497cot.txt)
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Table 2a. Yields and other agronomic data from the short staple variety study, Colvin Farms, Graham County, AZ, 1997.

Variety	SC YLD	% Turn Out	Lint Yld	Pl/Ac
IF 1003	2903.1 a ¹	38.0 ab	1102.3 a	90326.5 a
HYX 4103	2674.3 ab	37.0 bc	989.8 ab	55962.5 f
DP 35B	2476.3 abc	39.0 a	966.7 abc	66247.5 de
HS 44	2653.0 ab	36.0 bc	953.5 abc	65340.0 de
HS 12	2696.4 ab	34.8 d	937.9 abc	73507.5 bcd
DP 90	2475.3 abc	36.8 bc	912.1 abc	70361.5 cd
SG 248	2149.2 bcd	39.3 a	844.3 bc	73507.5 bcd
BXN 47	2156.0 bcd	38.0 ab	817.5 bcd	68546.5 cd
IF 1002	2131.9 bcd	37.5 b	800.3 bcd	75322.5 bc
STV 474	1960.5 cd	38.0 ab	746.0 cd	79436.5 b
HS 22	1791.6 d	34.8 d	621.8 d	58080.0 ef
SG 501	1626.3 d	37.5 b	609.9 d	58080.0 ef
Average	2307.8	37.2	858.5	69559.9
LSD(05)	507.7	1.2	194.5	7565.7
CV(%)	13	1.9	13.4	6.4

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

Table 2b. Continuation of Table 2a. Additional agronomic data from the short staple trial grown on the Colvin Farm, Graham County, 1997.

Variety	Pl/Ht	1st Frt Branch	Node	HNR	Boll weight
IF 1003	35.0 d	8.0 bc	20.8 f	1.70 bcd	5.15 a
HYX 4103	42.8 b	8.8 ab	24.8 abc	1.73 bc	4.10 g
DP 35B	44.3 ab	8.0 bc	23 de	1.92 a	4.50 cf
HS 44	38.3 c	7.8 c	25.3 ab	1.50 def	4.45 cde
HS 12	38.8 c	7.5 cd	24.3 bcd	1.60 c-f	4.64 c
DP 90	38.8 c	8.0 bc	23.5 cd	1.65 b-e	4.15 g
SG 248	39.3 c	7.8 c	21.8 ef	1.80 ab	4.60 cd
BXN 47	30.3 ef	7.5 cd	21.5 ef	1.40 fg	4.35 f
IF 1002	46.5 a	9.3 a	26 a	1.79 abc	4.45 d-f
STV 474	31.8 e	7.8 c	21.5 ef	1.48 ef	4.85 b
HS 22	28.0 f	7.5 cd	21.8 ef	1.29 g	4.40 ef
SG 501	32.8 de	6.8 d	20.3 f	1.63 b-e	4.65 c
Average	37.2	7.9	22.9	1.6	4.5
LSD(05)	2.6	--	1.5	0.17	1.5
CV(%)	4.1	6.0	4.1	6.3	2.0

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

Table 1a. Yield and other agronomic data from the short staple variety trial, Carpenter Farm, Graham county, AZ, 1997.

Variety	SC YLD	% TURNOUT	LINT YLD	PL/AC
DP 35B	3019.4 a ¹	36.5 cd	1102.1 a	67608.8 b-e
STV 474	2696.6 ab	40.3 a	1086.6 ab	69423.8 bcd
BXN 47	2441.2 bc	38.8 ab	947.2 bc	70331.3 bc
SG 501	2380.3 bcd	38.3 bc	910.7 cd	58533.8 ef
HS 22	2487.9 bc	35.5 de	878.5 cde	58987.5 def
DP 90	2266.2 b-e	38.0 bc	860.7 cde	78045.0 b
HS 44	2268.8 b-e	37.3 bcd	845.8 cde	62163.8 c-f
HYX 4103	2229.9 cde	36.5 cd	815.7 cde	75776.3 b
HS 12	2309.1 b-e	34.5 e	796.5 cde	70331.3 bc
SG 248	1961.5 def	39.0 ab	766.1 de	55357.5 f
IF 1000	1916.1 ef	38.3 bc	736.3 ef	101186.3 a
IF 1002	1598.5 f	37.8 bc	604.5 f	75322.5 b
Average	2297.9	37.5	862.5	70255.6
LSD(05)	378.8	1.7	145.6	9776.9
CV(%)	11.5	3.2	11.7	9.7

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

Table 1b. Continuation of Table 1. Additional agronomic data from the short staple trial grown on the Carpenter Farm, Graham County, 1997.

Variety	Plant Height	NODE	HNR
DP 35B	32.5 b ¹	21.5 bcd	1.5 ab
STV 474	25.5 e	20.3 d	1.3 de
BXN 47	28.0 de	21.0 d	1.4 bcd
SG 501	25.5 e	20.3 d	1.3 de
HS 22	25.8 e	23.3 abc	1.2 e
DP 90	30.3 bcd	21.3 cd	1.5 abc
HS 44	30.3 bcd	23.5 ab	1.3 cde
HYX 4103	30.8 bc	23.5 ab	1.3 cde
HS 12	31.5 b	20.5 d	1.3 cde
SG 248	28.8 cd	20.5 d	1.4 a-d
IF 1000	31.3 bc	21.0 d	1.5 ab
IF 1002	38.5 a	25.0 a	1.6 a
Average	29.9	22.1	1.4
LSD(05)	2.3	1.9	0.14
CV(%)	5.4	6.1	7.3

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

Table 3. HVI data from the short staple variety trial grown on the Carpenter Farm, Graham County, 1997.

VAR	C GRADE	LF GRADE	MIC	LEN (in)	STR	UNIF	TRASH	COLOR	RD	+B
DP 35B	11	2	4.0	1.14	29.4	80.5	3.0	11-2	80.5	91.0
STV 474	21/31	4.0	4.3	1.10	27.5	81.5	5.5	21-3 31-4	77.0	91.0
BXN 47	21	3.0	4.3	1.11	27.4	82.0	4.0	21-2 21-3	78.5	91.0
SG 501	21	4.0	4.2	1.10	28.1	81.0	4.5	21-4	77.0	92.0
HS 22	21	3.0	3.5	1.17	28.4	80.5	4.5	21-1 21-2	79.0	87.5
DP 90	11/21	3.0	3.8	1.13	30.1	81.0	4.0	11-3 21-3	79.5	89.5
HS 44	21	3.0	3.9	1.14	29.1	80.0	4.0	21-3 21-4	77.5	97.0
HYX 4103	21	4.0	3.8	1.14	28.3	80.5	6.5	21-4	77.0	92.0
HS 12	21	3.0	3.7	1.18	29.4	80.5	4.0	21-2	79.0	92.0
SG 248	21	3.0	4.4	1.16	28.0	80.5	3.5	11-1 21-2	80.0	90.0
IF 1001	21	3.5	3.7	1.15	29.8	80.0	4.0	11-2 21-2	79.0	89.0
IF 1002	21	3.0	3.2	1.16	29.5	80.5	4.0	21-1 21-2	79.0	88.0
AVG	--	3.2	3.9	1.14	28.7	80.7	4.3	--	78.6	90.8
LSD(05)	--	0.2	3.9	0.03	1.3	1.1	0.8	--	1.0	3.5
CV(%)	--	5.2	7.0	1.6	3.1	1.0	13.4	--	0.9	2.6

Table 3b. HVI data from the short staple variety trial grown on the Colvin Farm, Graham County, 1997.

Var	C Grade	LF Grade	Mic	Len (in)	Str g/tex	Unif	Trsh	Color	RD	+B
IF 1003	31	4.5	4.25	1.13	28.8	81.0	5.5	31-2	77.5	77.5
HYX 4103	31	4.0	4.55	1.14	29.2	80.0	11.0	31-2	77.0	79.0
DP 35B	31/41	5.0	4.60	1.11	28.7	80.0	10.5	31-1 41-2	75.0	79.0
HS 44	31/41	5.5	4.65	1.11	28.3	79.0	10.0	31-1 41-2	75.5	79.5
HS 12	41/42	5.5	4.30	1.14	29.2	79.5	12.5	41-2 41-3	72.5	78.5
DP 90	41	6.5	4.20	1.10	27.9	79.5	13.0	41-1 41-2	73.5	76.0
SG 248	31	4.0	4.55	1.13	28.8	79.5	6.5	31-2	77.5	78.0
BXN 47	31	4.5	4.55	1.07	27.1	81.0	10.5	31-2	76.0	87.0
IF 1002	32/41	6.0	4.05	1.13	28.8	79.8	14.0	31-1 31-2	75.5	76.0
STV 474	41	5.5	4.50	1.09	26.1	80.0	13.0	41-1 41-2	74.0	78.0
HS 22	31	5.0	4.45	1.11	26.0	79.5	7.0	31-2	77.5	77.5
SG 501	31/41	6.0	4.00	1.09	28.6	80.5	11.5	31-1 41-2	75.5	77.0
Avg	--	5.2	4.39	1.11	28.1	79.9	10.4	--	75.6	78.6
LSD	--	1.2	3.2	1.9	1.2	1.5	4.1	--	3.6	4.5
CV	--	13.3	4.3	1.0	2.6	1.1	23.2	--	2.8	3.4