

Pima Cotton Regional Variety Trial, Safford Agricultural Center, 2002

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Abstract

Twenty long staple varieties were tested in a replicated small plot trial on the Safford Agricultural Center in Graham County at an elevation of 2950 feet. The highest yielding variety in this study was HA 195 with a yield of 1419 pounds of lint per acre. This interspecific hybrid was the highest yielding variety in the 2001 study also (1). DP 340, one of Olvey's varieties, was the highest yielding non-hybrid variety in the study; it yielded over 1200 pounds of lint per acre. Yield and other agronomic data as well as fiber quality data are contained in this paper along with estimated values of the lint.

Introduction

This trial is a continuation of our search for the best variety of long staple cotton to grow in the Upper Gila Valley. Cultivars planted in this study include interspecific hybrids from the Hazera group in Israel, entries from Olvey's group, Phytogen, CPCSD, Button Willow Research and some old time standards. This is part of the Beltwide Regional variety study.

Materials and Methods

This trial was designed as a replicated small plot trial with four replications. The plots were planted with a cone-type planter which distributes a given weight of seed uniformly over the length of the plot. This year the seeds were planted dry and watered up. The following crop history provides the information on how the crop was managed:

Crop History:

Previous crop: Cotton

Soil type: Pima clay loam variant

Planting date: 26 April 2002

Rate: 25 pound per acre

Herbicide: 1.75 pt/ac Triap pre-plant, 4 pts/ac Caparol at lay-by

Fertilizer: side dressing of 100 lbs/ac of urea on 5/29 and 7/19

Insecticide: 1 application to control pink bollworm

Pix/Prep: None

Defoliation: Ginstar

Irrigation: Furrow, watered up +8 irrigations (ca. 30.5 inches + 1.6 inches of rain)

Harvest dates: 1st pick: 18 November

2nd pick: not taken

Heat units (86/55EF) from planting to harvest: 3681

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The plots were picked using a modified 2-row cotton picker. The production from each plot was caught in a sack and weighed on an electronic platform scale to determine seed cotton yields. Twenty-five boll samples were collected prior to harvest to determine boll weights. These samples were then ginned on a small roller gin to determine percent lint turnout and samples were submitted to the Cotton Classing Office for HVI analysis.

Results and Discussion

The weather conditions were slightly below normal for cotton stand establishment in 2002. A summary of the weather conditions during the growing season are included in the Acala Variety study (reference 1).

Table 1 contains yield data, crop value, percent lint turnout, plant height, and plant populations. Yields were exceptionally high this year with an average yield greater than 300 pound per acre more than was harvested in 2001. The top two varieties were interspecific hybrids from Israel with fuzzy seeds. Since lint yield is only one part of the value component, lint values were estimated from USDA AMS American Pima quotes for the Desert Southwest, using their premium and discount schedule. These values were then multiplied by the lint yield to calculate gross values per acre. Even with the lower lint value of HA 195 it still produced more income per acre than the more traditional Pima lines. It is interesting that DP 340, the highest yielding non-hybrid Pima, produced a higher value per acre than the HA 14-08, which had a higher yield. Lint turnout percentages varied by five percentage points with DP HTO the highest. Looking in Table 4, one sees that this variable is the only measured variable positively correlated with lint yield. Some differences are seen in plant heights and plant populations and they will be left for the reader's inspection.

Table 2 contains additional agronomical variables. There were significant differences in values for these variables by variety, but most of these comparisons will be left to the reader. Table 4 shows no direct statistical correlation to lint yield for any of these variables.

HVI values of the lint and an estimate of the lint value per pound are included in Table 3. All of the varieties in this test were ginned on a small roller gin and sent to the classing office as Pima varieties. The average micronaire was higher than in 2001 and two varieties got into the discount range. Length was longer, strength was higher and uniformity slightly less than the previous season (2). Olvey's Ex22 had the longest fiber and OA 345 had the strongest fiber. For the most part, the lint qualities were exceptional, as were the yields.

References

1. Clark, L.J., E.W. Carpenter and E.R. Norton. 2003. Acala/Upland cotton variety trial, Safford Agricultural Center, 2002. *Published elsewhere in this report.*
2. Clark, L.J., E.W. Carpenter and E.R. Norton. 2002. Pima cotton regional variety trial, Safford Agricultural Center, 2001. Cotton, A College of Agriculture and Life Sciences Report, The University of Arizona, Tucson, AZ. Series P-130, pp. 105-109.

Table 1. Yield and other agronomic variables for Regional Pima Variety trial, Safford Agricultural Center, 2002.

Variety	Lint Yield ¹ (lbs/ac)	Value ² (\$/acre)	% Lint Turnout	Plant Height (inches)	Plants per Acre
HA 195	1419 a	\$1,113.92	34.3 abc	37.0 abc	53996 abc
HA 14-08	1239 b	\$1,019.08	31.5 hij	34.5 a-d	53089 abc
DP 340	1231 bc	\$1,074.75	33.6 b-e	32.3 b-f	60349 a
OA Ex22	1198 bc	\$1,045.26	33.6 b-f	32.8 a-f	54450 abc
DP HTO	1160 bcd	\$1,012.10	35.7 a	28.5 ef	56719 ab
E 501	1150 bcd	\$1,014.88	34.0 bcd	33.0 a-f	50366 abc
Pima S-6	1137 bcd	\$992.73	34.9 ab	32.5 a-f	46283 bc
E 202	1137 bcd	\$1,003.40	34.0 bcd	32.0 c-f	54450 abc
OA 345	1124 b-e	\$949.78	33.6 b-e	32.8 a-f	46736 bc
Pima S-7	1095 b-f	\$925.28	33.4 b-g	31.8 c-f	50366 abc
BR 007	1082 c-g	\$914.29	33.0 c-h	37.8 a	49913 abc
HA 83-08	1037 d-g	\$886.64	30.2 j	33.5 a-e	50366 abc
DP 744	1037 d-g	\$915.15	32.0 f-i	32.0 c-f	53996 abc
Phy 57	1035 d-g	\$913.39	32.2 e-i	35.3 a-d	53089 abc
E 104	1033 d-g	\$911.62	33.8 bcd	31.3 def	49913 abc
E 601	1023 d-g	\$892.57	32.8 c-h	31.8 c-f	53996 abc
Phy 76	1007 d-g	\$878.61	31.9 ghi	37.0 abc	51274 abc
NM 1331	975 efg	\$860.44	32.7 d-h	37.5 ab	47644 bc
E 101	956 fg	\$836.50	33.0 c-h	27.8 f	51274 abc
NM 1601	956 fg	\$843.67	31.9 hgi	35.3 a-d	55358 ab
NM 1708	929 g	\$785.01	30.7 ij	37.0 abc	53089 abc
Average	1093.2	\$942.34	33.0	33.5	52267.7
LSD(05)	156.8		1.6	5.4	10870.6
CV(%)	10.1		3.4	11.3	14.7

1. Values followed by the same letter are not significantly different at the 95% level of confidence using standard statistical procedures.

2. Values in dollars per acre using the lint values per pound shown in Table 3.

Table 2. Plant mapping and boll weight data for Regional Pima Variety trial, Safford Agricultural Center, 2002.

Variety	1st Fruiting Branch ¹	Total Nodes	HNR	Boll Weight (grams)
HA 195	7.3 e	28.0 ab	1.33 a-d	4.01 ab
HA 14-08	8.0 de	26.0 abc	1.35 a-d	4.36 a
DP 340	8.8 b-e	24.0 cd	1.38 abc	3.34 c-g
OA Ex22	9.3 b-e	23.8 cd	1.39 ab	3.00 fg
DP HTO	8.3 cde	25.3 a-d	1.14 cd	3.41 c-f
E 501	10.8 abc	24.5 bcd	1.35 a-d	3.44 cde
Pima S-6	9.5 b-e	23.3 cd	1.41 ab	3.14 d-g
E 202	7.3 e	26.5 abc	1.21 bcd	3.15 d-g
OA 345	8.0 de	24.8 a-d	1.32 a-d	2.91 g
Pima S-7	8.3 cde	22.0 d	1.44 ab	3.46 cde
BR 007	11.3 ab	25.3 a-d	1.49 a	3.08 efg
HA 83-08	7.5 de	28.0 ab	1.22 bcd	4.33 a
DP 744	9.0 b-e	24.5 bcd	1.31 a-d	3.45 cde
Phy 57	10.0 a-d	24.5 bcd	1.45 ab	3.38 c-f
E 104	9.0 b-e	25.3 a-d	1.27 a-d	2.92 g
E 601	9.3 b-e	25.5 a-d	1.25 a-d	3.55 cd
Phy 76	8.5 cde	28.5 a	1.31 a-d	3.14 d-g
NM 1331	9.3 b-e	26.8 abc	1.41 ab	3.10 efg
E 101	9.5 b-e	25.0 a-d	1.11 d	3.75 bc
NM 1601	9.5 b-e	25.5 a-d	1.38 abc	3.28 d-g
NM 1708	12.5 a	26.3 abc	1.42 ab	3.44 cde
Average	9.1	25.4	1.33	3.41
LSD(05)	2.5	3.9	0.25	0.43
CV(%)	19.9	11.0	13.3	9.0

1. Values followed by the same letter are not significantly different at the 95% level of confidence using standard statistical procedures.

Table 3. HVI data for Regional Pima Variety trial, Safford Agricultural Center, 2001.

Variety	Color Grade	Leaf Grade	Mike	Length	Staple	Strength	Uniformity	HVI Trash	HVI Color	Color		Lint Value ¢/lb ¹
										RD	+B	
HA 195	2	3	47	142	48	36.6	89	10	1-	73	101	78.50
HA 14-08	1	2	44	140	48	36.7	86	6	1-	74	97	82.25
DP 340	2	2	49	139	48	42.6	87	7	1-	73	115	87.25
OA Ex22	2	2	50	147	50	41.6	87	7	1-	72	115	87.25
DP HTO	2	2	46	139	48	43.2	86	8	1-	73	108	87.25
E 501	1	2	46	140	48	41.5	86	3	1-	76	102	88.25
Pima S-6	2	2	47	137	48	41.3	87	9	1-	71	112	87.25
E 202	1	2	46	144	50	41.9	87	3	1-	73	117	88.25
OA 345	2	3	46	142	48	43.8	87	5	1-	72	105	84.50
Pima S-7	2	3	49	142	48	43.3	87	7	2-	71	110	84.50
BR 007	2	3	46	143	50	40.4	87	11	2-	67	119	84.50
HA 83-08	1	3	39	141	48	37.8	87	6	1-	77	95	85.50
DP 744	1	2	48	144	50	41.1	87	5	1-	73	114	88.25
Phy 57	1	2	43	141	48	44.1	87	5	1-	75	106	88.25
E 104	1	2	46	143	50	43.2	89	3	1-	74	113	88.25
E 601	2	2	44	138	48	42.7	88	4	1-	70	120	87.25
Phy 76	2	2	48	140	48	40.7	87	5	1-	71	120	87.25
NM 1331	1	2	43	145	50	39.8	88	4	1-	71	111	88.25
E 101	1	1	46	133	46	38.2	84	3	1-	75	103	87.50
NM 1601	1	2	50	145	50	41.0	87	4	1-	73	113	88.25
NM 1708	2	3	42	143	50	38.1	87	5	1-	74	107	84.50
Average	--	2.0	46.0	140.3	48.7	39.1	86.0	4.0	--	74	108	86.33

1. Estimated lint value per pound using USDA AMS American Pima quotes for the Desert Southwest on 15 Jan 2003, then discounting 6¢ per pound for strength less than 37.

Table 4. Correlations versus Lint Yields for the Regional Pima Variety trial, Safford Agricultural Center, 2002.

Variable	Probability	Variable	Probability
1st Fruiting Branch	NS	Plants per Acre	NS
Total Nodes	NS	% Lint Turnout	0.000019 ***
Plant Height	NS	Boll Weight	NS
HNR	NS		