

2000 Low Desert Upland Cotton Advanced Strains Testing Program

*S. Husman, H. Moser, R. Wegener,
University of Arizona Cooperative Extension*

Abstract

Upland cotton advanced strains and commercial check comparison varieties were evaluated in replicated field studies at four locations in 2000. The test sites include Yuma, AZ., Buckeye, AZ., Maricopa, AZ., and Safford, AZ.. Nine seed companies submitted a maximum of five advanced strains entries per location. Three commercial check varieties were used at each site for comparison purposes and included DP 5415, SG 125, and STV 474.

Introduction

Profitable cotton production in the low deserts of Arizona is becoming increasingly challenging due to rapidly rising input costs and stagnant cotton prices. As a result, Arizona producers are extremely interested in exploration of opportunities to increase yields and/or decrease production costs. Variety selection is the first and most important decision a producer makes at season initiation. A major objective of these advanced strains evaluations is to provide independent data to participating seed companies relative to their strains performance under commercial production conditions at different locations. Information from these studies contribute to the database for breeder selection of varieties for possible commercialization based on performance under the low desert environmental conditions.

Materials and Methods

A range of 33 to 42 Upland cotton advanced strains representing nine seed companies were tested in 2000 at four sites in Yuma, AZ., Buckeye, AZ., Maricopa, AZ., and Safford, AZ.. Participating seed companies submitted entries of their choice at each respective test site (Table 1).

Plots ranged from two to six rows in width by location dependent on equipment configuration and were 38 feet long. Plots were planted using cone planters on March 15, March 30, April 5, and April 12, 2000 at Yuma, Buckeye, Maricopa, and Safford respectively. In order to assure an adequate stand, a seeding rate of twenty five pounds per acre was used. After stand establishment was complete, all plots were thinned to a targeted uniform population of 40,000 plants per acre in May, 2000.

The experiments were harvested on September 9, November 28, October 18, and November 21, 2000 at Yuma, Buckeye, Maricopa, and Safford respectively. Seed cotton yields were measured by mechanically harvesting the center two rows of each plot with a modified cotton picker and bagging attachment. Weights were measured using a tri-pod and a hanging electronic scale to weigh the seed cotton from each plot. Prior to mechanical harvest, 50 bolls from non yield rows were hand harvested. These sub-samples were ginned to determine percent lint. Final lint yields were then calculated on a per acre basis. Each fiber sample from the ginning process was submitted to the USDA Cotton Classing Office in Phoenix, AZ. for grades and HVI fiber quality analysis. Plant population and stand uniformity was extremely variable at the Safford test location. Final yields were also highly variable. The test quality was unacceptably compromised and the results will not be published.

Results

Final lint yields at the Yuma site ranged from a high of 2289 lbs./a (ACGA, ACG 004) to a low of 1411 lbs./A (CPCSD, M643). Final lint yields at the Buckeye site ranged from a high of 2202 lbs./A (ACGA, ACG 004) to a low of 1358 lbs./A (Pure Genetics, PG 0-93). Final lint yields at the Maricopa site ranged from a high of 1693 lbs./A (Stoneville, STX 8M007) to a low of 865 lbs./A (Pure Genetics, PG 0-94). Tables 2,3,4, summarize the lint yield/A and HVI based fiber quality data for Yuma, Buckeye, and Maricopa, respectively.

Acknowledgments

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Table 1. Seed Companies and Varieties Submitted for the Low Desert Upland Cotton Advanced Strains Testing Program 2000.

<u>Arizona Cotton Growers Association</u>	<u>Helena Cotton Research</u>
ACG-994	HCR 200RR
ACG-001	HCR 300RR
ACG-002	HCR 400RR
ACG-003	HCR 7061
ACG-004	HCR 7104
	HCR 7163
	HCR 7311
	HCR 7312
	HCR 7344
	HCR 7357
	HCR 7532
	HCR 8129
	HCR 8414
	HCR 9162
	HCR 9226
	HCR 9228
<u>Aventis Crop Science</u>	<u>Mississippi University</u>
ACSI IF 1000	8839-3-10-2
ACSI EXP0805	8806-3-2-19
ACSI EXP0858	
ACSI EXP0422	
ACSI EXP0118	
<u>Buttonwillow Research, LLC</u>	<u>Pure Genetics</u>
BRS 0001	PG 0-91
BRS 0002	PG 0-92
BRS 0003	PG 0-93
BRS 0004	PG 0-94
	PG 0-95
<u>California Planting Cotton Seed Distributors</u>	<u>Stoneville Pedigreed Seed Company</u>
M539	STX 8M007
M557	
M643	
M657	
<u>Delta Pine Seed</u>	<u>University of Arizona</u>
DPX 99X02	MAC 13
DPX 99S01R	MAC 95
DPX 99T07	
DPX 00T04	
SGX 96235	

Germain's Cotton Seeds Inc.GC-114
GC-115
GC-377**Test Checks**Delta Pine DP 5415
Sure Grow SG 125
Stoneville STV 474**Table 2. Low Desert Upland Cotton Advanced Strains Testing Program 2000 Yuma, AZ.**

Company	Strain	Lint (lbs./Acre)		Mic	Length (100ths)	Length (32nds)	Strength (GM/Tex)
ACGA	ACG004	2289	a*	5.1	1.17	38	30.4
Helena Cotton Research	HCR 7357	2174	a b	5.3	1.06	35	25.8
Helena Cotton Research	HCR 9228	2139	a b c	4.6	1.12	36	28.7
ACGA	ACG994	2087	a b c d	4.8	1.15	37	31.2
ACGA	ACG001	2086	a b c d	4.7	1.16	37	30.5
Aventis Crop Science	ACSI EXP0422	2060	a b c d e	5.1	1.13	36	31.3
Deltapine Seed	SGX 96235	2041	a b c d e	5.1	1.17	37	30.3
Aventis Crop Science	ACSI EXP0805	2017	a b c d e f	5.0	1.12	36	29.8
Check	DP 5415	1985	a b c d e f	5.2	1.14	37	30.6
CPCSD	M657	1962	a b c d e f	4.7	1.07	34	28.9
ACGA	ACG002	1917	a b c d e f g	5.2	1.14	37	31.7
CPCSD	M539	1906	a b c d e f g	4.8	1.13	36	31.1
ACGA	ACG003	1883	a b c d e f g	5.3	1.09	35	29.5
Helena Cotton Research	HCR 7532	1877	b c d e f g h	4.9	1.14	37	30.0
Aventis Crop Science	ACSI EXP0118	1876	b c d e f g h	5.3	1.10	35	30.2
Buttonwillow Research	BRS 0001	1866	b c d e f g h	5.3	1.09	35	28.0
Check	AP 9257	1853	b c d e f g h	4.9	1.09	35	28.7
Deltapine Seed	DPX 99T07	1849	b c d e f g h	5.1	1.06	34	27.3
Deltapine Seed	DPX 00T04	1839	b c d e f g h	4.8	1.16	37	32.4
Buttonwillow Research	BRS 0004	1802	b c d e f g h i	5.0	1.16	37	31.0
CPCSD	M557	1794	b c d e f g h i	4.8	1.09	35	29.9
Buttonwillow Research	BRS 0003	1760	c d e f g h i	5.2	1.12	36	30.5
Helena Cotton Research	HCR 7061	1722	d e f g h i	4.6	1.17	37	30.0
Deltapine Seed	DPX 99X02	1720	d e f g h i	5.0	1.14	37	30.0
University of Arizona	MAC 95	1688	d e f g h i	5.1	1.09	35	29.4
Aventis Crop Science	ACSI EXP0858	1656	e f g h i	4.9	1.11	36	31.9
Helena Cotton Research	HCR 7344	1655	e f g h i	4.8	1.15	37	30.8
Buttonwillow Research	BRS 0002	1608	f g h i	5.3	1.10	35	29.5
Check	STV 474	1546	g h i	4.6	1.10	36	27.6
Deltapine Seed	DPX 99S01R	1530	g h i	5.0	1.07	35	26.7
University of Arizona	MAC 13	1467	h i	5.0	1.14	37	32.0
CPCSD	M643	1411	i	4.6	1.13	37	32.5

* Means followed by the same letter are not significantly different at the 0.05 Level of Significance.

Lint lbs./A - Observed Significance Level = 0.0039; C.V. = 15.9; LSD = 412.0

SAS ANOVA DF = 3,31

Table 3. Low Desert Upland Cotton Advanced Strains Testing Program 2000 Buckeye, AZ.

Company	Strain	Lint (lbs./Acre)		Mic Length (100ths)	Length (32nds)	Strength (GM/Tex)	
ACGA	ACG004	2202	a*	5.3	1.11	36	28.7
ACGA	ACG003	2145	a b	5.5	1.09	35	30.6
ACGA	ACG002	2103	a b	5.5	1.12	36	30.8
ACGA	ACG994	2086	a b c	5.1	1.13	36	29.0
Check	DP 5415	2077	a b c	5.5	1.13	36	29.1
Aventis Crop Science	ACSI EXP0422	2053	a b c d	5.5	1.13	36	30.6
Check	SG 125	2047	a b c d	5.3	1.15	37	29.5
Helena Cotton Research	HCR 8129	2011	a b c d e	5.5	1.10	35	26.7
Germain's Cotton Seeds	GC 377	1993	b c d e	5.6	1.11	36	28.6
Deltapine Seed	SGX 96235	1972	b c d e f	5.3	1.12	36	29.5
Deltapine Seed	DPX 99T07	1961	b c d e f	5.1	1.10	35	28.4
Buttonwillow Research	BRS 0001	1895	c d e f g	5.3	1.11	36	29.7
Buttonwillow Research	BRS 0003	1887	c d e f g h	5.2	1.08	35	32.1
Helena Cotton Research	HCR 7104	1865	d e f g h i	5.6	1.16	37	31.1
Helena Cotton Research	HCR 9162	1864	d e f g h i	5.1	1.15	37	32.0
Buttonwillow Research	BRS 0004	1864	d e f g h i	5.0	1.13	36	31.2
Deltapine Seed	DPX 00T04	1822	e f g h i j	5.1	1.18	38	32.0
CPCSD	M557	1814	e f g h i j k	5.1	1.07	34	28.8
CPCSD	M539	1812	e f g h i j k	5.1	1.11	36	28.6
ACGA	ACG001	1811	e f g h i j k	4.8	1.17	38	30.3
Aventis Crop Science	ACSI EXP0118	1773	f g h i j k	5.5	1.08	35	31.1
Germain's Cotton Seeds	GC 115	1746	g h i j k l	5.3	1.14	36	29.2
Helena Cotton Research	HCR 7163	1740	g h i j k l	5.3	1.12	36	30.1
Aventis Crop Science	ACSI EXP0805	1740	g h i j k l	5.0	1.13	36	32.4
Stoneville	STX 8M007	1722	g h i j k l	4.7	1.08	35	29.2
Check	STV 474	1699	g h i j k l	5.2	1.06	34	25.9
Pure Genetics	PG 0-91	1685	h i j k l m	5.2	1.16	37	31.9
University of Arizona	MAC 95	1682	i j k l m	5.3	1.15	37	31.5
Pure Genetics	PG 0-92	1660	j k l m n	5.2	1.14	37	29.6
Deltapine Seed	DPX 99X02	1649	j k l m n	5.1	1.13	37	29.2
Aventis Crop Science	ACSI EXP0858	1642	j k l m n	5.1	1.09	35	31.2
CPCSD	M657	1633	j k l m n	4.9	1.05	33	28.9
Pure Genetics	PG 0-94	1631	j k l m n	5.0	1.08	35	30.1
CPCSD	M643	1617	k l m n	4.6	1.18	38	32.4
Helena Cotton Research	HCR 8414	1559	l m n o	5.4	1.12	36	30.7
University of Arizona	MAC 13	1484	m n o	5.4	1.12	36	32.1
Germain's Cotton Seeds	GC 114	1479	n o	4.5	1.08	35	29.2
Deltapine Seed	DPX 99S01R	1473	n o	5.0	1.09	35	27.0
Buttonwillow Research	BRS 0002	1413	o	5.4	1.08	35	28.7
Pure Genetics	PG 0-93	1358	o	4.1	1.12	36	28.6

* Means followed by the same letter are not significantly different at the 0.05 Level of Significance.

Lint lbs./A - Observed Significance Level = 0.0001; C.V. = 8.1; LSD = 203.4

SAS ANOVA DF = 3,39

Table 4. Low Desert Upland Cotton Advanced Strains Testing Program 2000 Maricopa, AZ.

Company	Strain	Lint (lbs./A)		Mic	Length (100ths)	Length (32nds)	Strength (GM/Tex)
Stoneville	STX 8M007	1693	a*	5.4	1.12	36	29.7
Helena Cotton Research	HCR 7357	1614	a b	5.5	1.07	34	26.9
Check	STV 474	1578	a b	5.6	1.10	35	29.2
Check	SG 125	1567	a b	5.4	1.12	36	26.6
Helena Cotton Research	HCR 7532	1542	b	5.4	1.15	37	31.1
Helena Cotton Research	HCR 9228	1523	b	4.9	1.10	35	31.8
Helena Cotton Research	HCR 7311	1506	b	5.5	1.14	36	29.9
Helena Cotton Research	HCR 7312	1348	c	5.3	1.16	37	29.0
ACGA	ACG004	1342	c	5.2	1.15	37	30.8
Buttonwillow Research	BRS 0002	1336	c	5.6	1.11	36	30.7
Pure Genetics	PG 0-95	1329	c	5.0	1.12	36	30.8
Buttonwillow Research	BRS 0003	1321	c d	5.4	1.15	37	31.7
Aventis Crop Science	ACSI EXP0422	1313	c d e	5.2	1.13	36	31.1
Pure Genetics	PG 0-92	1307	c d e	5.7	1.11	36	29.6
ACGA	ACG003	1304	c d e	5.2	1.15	37	30.5
Deltapine Seed	DPX 00T04	1294	c d e f	5.2	1.16	37	32.7
ACGA	ACG994	1292	c d e f	5.0	1.19	38	31.1
Buttonwillow Research	BRS 0001	1290	c d e f	5.8	1.15	37	31.4
Aventis Crop Science	ACSI EXP0858	1284	c d e f	5.4	1.12	36	33.1
Pure Genetics	PG 0-93	1279	c d e f	4.5	1.19	38	28.7
Deltapine Seed	DPX 99S01R	1251	c d e f g	5.5	1.09	35	28.7
Germain's Cotton Seeds	GC 115	1245	c d e f g	5.2	1.14	37	33.1
Buttonwillow Research	BRS 0004	1245	c d e f g	5.7	1.15	37	30.4
Mississippi	MU 002	1231	c d e f g	5.3	1.11	36	29.5
CPCSD	M657	1223	c d e f g h	5.0	1.04	33	30.7
ACGA	ACG002	1193	d e f g h i	5.3	1.15	37	31.4
Deltapine Seed	DPX 99X02	1187	e f g h i j	5.1	1.17	37	31.3
Deltapine Seed	SGX 96235	1169	f g h i j k	5.0	1.17	37	30.3
Deltapine Seed	DPX 99T07	1126	g h i j k l	5.1	1.09	35	30.9
Aventis Crop Science	ACSI EXP0805	1101	h i j k l	5.1	1.14	36	30.6
Check	DP 5415	1076	i j k l	5.1	1.11	36	30.1
CPCSD	M539	1072	i j k l	4.8	1.11	36	31.5
ACGA	ACG001	1068	i j k l	4.7	1.19	38	32.2
Pure Genetics	PG 0-91	1059	j k l	5.4	1.15	37	33.3
CPCSD	M643	1045	k l	4.4	1.16	37	33.2
Aventis Crop Science	ACSI EXP0118	1039	l	5.5	1.11	36	33.9
CPCSD	M557	1017	l	4.8	1.09	35	30.7
Mississippi	MU 001	1014	l	5.0	1.14	37	28.8
Pure Genetics	PG 0-94	865	m	5.1	1.06	34	31.3

* Means followed by the same letter are not significantly different at the 0.05 Level of Lint lbs./A - Observed Significance Level = 0.0001; C.V. = 7.28; LSD = 128.9
SAS ANOVA DF = 3,38