1996 Low Desert Upland Cotton Advanced Strains Testing.

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Abstract

Upland cotton advanced strains and commercial check comparison varieties were evaluated in replicated field studies in 1996 on Cooperator fields in Queen creek, Buckeye, and Gila Bend, AZ. Eight seed companies submitted advanced strains plus a commercially available check of their choice for each site. The highest lint yields for advanced strains entries by location were: J & S Research JSX 12 (1890 lb./acre), Delta Pine and Land Co. DPX 1075 (1420 lb/acre) and Delta Pine and Land Co. DPX 1075 (2510 lb/acre) at Queen Creek, Buckeye and Gila Bend, Arizona respectively.

Introduction

Profitable cotton production in the low deserts of Arizona is becoming increasingly challenging due to rapidly rising input costs and cotton prices which are not tracking the increasing costs. As a result, Arizona producer's only remaining production advantage is the environmental conditions conducive to high lint yields. Variety selection to maximize yield potential is the first and most important decision a producer makes at season initiation. A major objective of these advanced strains evaluations is to provide additional 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

Twenty three Upland cotton advanced strains representing eight seed companies were tested in 1996 on three commercial cooperator sites in Queen Creek, Az., Buckeye, Az and Gila Bend, AZ. Participating seed companies submitted entries plus a commercially available check of their choice at each test site (Table 1).

Plots were four rows wide (38 in.) and 38 feet long in Queen Creek and six rows wide (38 in.) and 38 feet long in Buckeye and Gila Bend. Plots were dry planted using cone planters and irrigated up on April 11, April 4, and April

6, 1996 in Queen Creek, Buckeye, and Gila Bend respectively. Due to unknown germination differences, a seeding rate of fifteen pounds per acre was used. After stand establishment was complete, all plots were hand thinned to a targeted uniform population of 35,000 plants per acre in early May, 1996.

Detailed plant mapping measurements were made approximately every three weeks. Measurements included plant height, number of mainstem nodes, height:node ratios, and fruit retention.

The experiments were harvested on November 1, November 22, and December 11, 1996 in Queen Creek, Buckeye, and Gila Bend 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, all bolls on five plants in 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 (Tables 2, 3, 4).

Results

Final lint yields ranged from a high of 1890 lb./acre (JSX 12) to a low of 946 lb./acre (HX 6304) at the Queen Creek site. Final lint yields at the Buckeye site ranged from a high of 1420 lb./acre (DPX 1075) to a low of 878 lb./acre (GC 9306). Final lint yields at the Gila Bend site ranged from a high of 2510 lb./acre (DPX 1075) to a low of 1412 lb./acre (OAX). Significant range in lint yields was observed at all sites.

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

DELTA & PINE LAND COMPANY DPX 1075 DPX 9050 DPX 9057 DPL 5415 (Check)	OLVEY & ASSOCIATES OAX
GERMAIN'S COTTON SEEDS INC. GC 9230 GC 9306 GCX MS3 GC 210 (Check)	STONEVILLE PEDIGREED SEED COMPANY X 470 XM 002 STV 474 (Check)
J & S RESEARCH JSX 10 JSX 12 JSX 22 HS 44 (Check)	ARIZONA PROCESSING (SURE-GROW) SGX 180 SGX 248 SGX 259 SURE-GROW 125 (Check)
PAYMASTER SEED COMPANY HX 5470 HX 6304 HX 6404 HX 5370 HX 6604 H 1220 BG H 1330 (Check) H 1244 (Check)	TERRA INTERNATIONAL T 101-1 T 306-96 C40 (Check)

Table 2. Low Desert Upland Cotton Advanced Strains Testing Program, 1996, Queen Creek, AZ.

Company	Variety	Lint/Acre[a/]	Lint %	Seed Cotton/Acre[b/]	Fiber Quality: Micronaire	Length (100ths)	Length (32nds)	Strength (GM/Tex)
J & S Research	JSX 12	1890 a	36.9	5123 a	5.2	118	38	31
Delta Pine & Land Co.	DPX 1075	1869 a b	37.8	4951 a b	5.1	115	37	32.5
Sure-Grow	SG 125	1736 a b c	38	4573 a b c	4.9	115	37	27.9
Delta Pine & Land Co.	DPL 5415	1730 a b c	36.9	4688 a b c	5	117	38	31.3
Sure-Grow	SGX 259	1712 a b c	40.3	4253 a b c d e	5.2	119	38	34.4
Stoneville	X 470	1706 a b c	38	4495 a b c d	5	115	37	28
J & S Research	HS 44	1650 a b c d	36.1	4570 a b c	5.4	120	38	31.1
Germains	GC 9230	1570 a b c d	38	4132 a b c d e	4.9	120	39	31.3
Sure-Grow	SGX 180	1552 a b c d	36.7	4235 a b c d e	4.3	123	39	34.3
J & S Research	JSX 10	1544 a b c d	37.4	4133 a b c d e	5.2	113	37	32.8
Stoneville	STV 474	1536 a b c d	39.2	3919 b c d e	5.3	116	38	29.4
Delta Pine & Land Co.	DPX 9050	1515 a b c d	38.8	3910 b c d e	4.9	117	37	29.7
Terra	T C 40	1504 a b c d e	37.5	4012 a b c d e	5	115	37	26.8
Sure-Grow	SGX 248	1468 a b c d e	39	3769 b c d e f	5.1	124	40	34
Terra	T 101-1	1468 a b c d e	33.1	4435 a b c d	5.1	119	38	27.5
J & S Research	JSX 22	1416 b c d e	34.3	4133 a b c d e	5	119	38	30.5
Germains	GC 210	1402 b c d e	36.4	3855 b c d e	4.5	122	39	34.2
Delta Pine & Land Co.	DPX 9057	1398 b c d e f	37.4	3738 b c d e f g	4.9	118	38	29.6
Stoneville	X M002	1369 c d e f	39.6	3457 d e f g	4.6	113	37	30.8
Paymaster	HX 5470	1296 d e f	36.1	3524 c d e f g	4.6	115	37	30.1
Paymaster	HX 6404	1283 d e f g	38	3380 e f g	5.4	111	36	31.9
Germains	GCX MS3	1249 d e f g	35.7	3498 d e f g	5.4	121	39	33.8
Terra	T 306-96	1117 e f g	34.4	3252 e f g	5	119	38	28.4
Paymaster	H 1244	1064 f g	36.1	2950 f g	4.7	115	37	30.2
Germains	GC 9306	954 g	35.8	2667 g	4.4	115	37	37.3
Paymaster	HX 6304	946 g	36.8	2570 g	5.3	115	37	28.8

[a/] Means followed by the same letter are not different at the 0.05 Level of Significance. SAS Proc GLM, D. F. = 3, 24 Lint: F = 3.72, O. S. L.= 0.0001, C. V.=16.6, LSD= 422 lb.
[b/]Cotton Seed: F= 3.32 . O. S. L. = 0.0001, C. V. = 16.6, LSD = 910 lb.

Table 3. Low Desert Upland Cotton Advanced Strains Testing Program, 1996, Buckeye, AZ.

Company	Variety	Lint/Acre[a/]	Lint %	Seed Cotton/Acre[b/]	Fiber Quality			
					Micronaire	Length (100ths)	Length (32nds)	Strength (GM/Tex)
Sure-Grow	SG 125	1452 a	37.5	3873 a b c	5.3	116	37	28.6
Delta Pine & Land Co.	DPX 1075	1420 a b	35.9	3955 a b	5.4	117	37	35.2
Delta Pine & Land Co.	DPL 5415	1406 a b	37.0	3800 a b c d	5.4	115	37	32.8
Sure-Grow	SGX 259	1392 a b	37.7	3691 a b c d e	5.4	117	38	31.8
Sure-Grow	SGX 248	1391 a b	38.3	3632 b c d e	5.2	117	38	30.5
Germains	GC 9230	1372 a b	35.1	3909 a b c	5.2	118	38	32.2
J & S Research	JSX 22	1371 a b c	33.3	4068 a	5	117	38	29.6
Delta Pine & Land Co.	DPL NUCotton 33 B	1370 a b c	34.4	3982 a	5.3	117	38	30.7
Delta Pine & Land Co.	DPX 9057	1356 a b c d	34.6	3918 a b	5.4	118	38	30.8
Sure-Grow	SGX 180	1349 a b c d	34.6	3900 a b c	4.5	118	38	30.2
Paymaster	HX 6604	1340 a b c d	35.5	3773 a b c d	4.7	116	37	30.5
J & S Research	JSX 10	1326 a b c d	35.7	3714 a b c d e	5.4	110	35	32.8
Delta Pine & Land Co.	DPX 9050	1309 b c d e	37.2	3518 c d e f	5.3	118	38	32.8
Paymaster	HX 5370	1282 b c d e f	37.3	3437 d e f g	5.1	109	35	27.4
Germains	GCX MS3	1234 c d e f	33.4	3696 a b c d e	4.9	120	38	32.1
J & S Research	JSX 12	1217 d e f	35.0	3477 d e f	5.5	121	39	32.5
Paymaster	HS 44	1175 e f	34.5	3405 e f g h	5.6	118	38	32.7
Paymaster	HTZ 1220 BG	1146 f	35.3	3248 f g h	5.3	114	37	31
Paymaster	H 1330	1124 f	36.3	3096 g h	4.3	113	37	31.5
Germains	GC 210	1109 f	34.9	3177 f g h	5.3	118	38	32.5
Paymaster	HX 6304	1107 f	36.5	3032 g h i	5.2	113	36	28.2
Germains	GC 9306	878 h	33.1	2650 i	3.9	114	37	37.5

[a/] Means followed by the same letter are not different at the 0.05 Level of Significance. SAS Proc GLM, D. F. = 3, 24 Lint: F = 8.34, O. S. L.= 0.0001, C. V.=7.8, LSD= 141 lb.

[b/] Cotton Seed: F=7.51. O. S. L. = 0.0001, C. V. = 7.8, LSD = 395 lb.

Table 4. Low Desert Upland Cotton Advanced Strains Testing Program, 1996, Gila Bend, AZ.

Company	Variety	Lint/Acre[a/]	Lint %	Seed Cotton/Acre[b/]	Fiber Quality			
					Micronaire	Length (100ths)	Length (32nds)	Strength (GM/Tex)
Delta Pine & Land	DPX 1075	2510 a	38.2	6570 a	5.0	115	37	34.0
Sure-Grow	SGX 248	2437 a b	37.6	6480 a	5.2	116	37	30.5
Sure-Grow	SGX 259	2403 a b c	36.8	6529 a	5.2	119	38	34.1
Delta Pine & Land	DPX 9057	2385 a b c d	37.2	6412 a b	4.9	114	37	30.5
Delta Pine & Land	DPL 5415	2361 a b c d	37.1	6364 a b	5.1	116	37	30.5
Sure-Grow	SG 125	2317 a b c d e	37.9	6113 a b c	4.8	111	36	25.7
Sure-Grow	SGX 180	2290 a b c d e f	36.3	6308 a b	4.9	120	38	31.4
Paymaster	HX 6404	2262 a b c d e f	38.3	5905 a b c d	5.1	108	35	28.4
Germains	GC 9230	2250 a b c d e f	34.5	6520 a	5.0	115	37	30.4
Germains	GCX MS3	2245 a b c d e f	36.7	6118 a b c	5.0	111	36	29.7
Paymaster	H 1244	2211 b c d e f	37.7	5864 a b c d	4.3	114	37	27.5
J & S Research	JSX 12	2207 b c d e f	36.1	6113 a b c	5.1	117	38	31.8
Delta Pine & Land	DPX 9050	2163 b c d e f g	38.2	5661 b c d	5.1	115	37	32.7
Paymaster	HX 5370	2161 b c d e f g	37.9	5702 b c d	4.0	112	36	27.5
Stoneville	STV 474	2142 c d e f g	38.9	5507 c d	4.3	113	36	28.8
J & S Research	HS 44	2141 d e f g	35.7	5998 a b c	5.4	116	37	32.7
Paymaster	HX 5470	2086 e f g	38.2	5462 c d e	4.2	109	35	26.6
J & S Research	JSX 22	2063 e f g	34.3	6014 a b c	4.7	118	38	29.0
Germains	GC 210	2011 f g	36.6	5494 c d	5.1	118	38	28.1
J & S Research	JSX 10	1900 g h	36.6	5190 d e	5.1	108	35	31.5
Germains	GC 9306	1669 h i	35.7	4674 e f	4.2	117	38	36.5
O. A.	OAX	1412 h i	35.3	4000 f	5.5	115	37	30.0

[a/] Means followed by the same letter are not different at the 0.05 Level of Significance. SAS Proc GLM, D. F. = 3, 24 Lint: F =6.39 , O. S. L.= 0.0001, C.V.=9.3, LSD= 284 lb.

[b/] Cotton Seed: F=5.69. O. S. L. = 0.0001, C. V. = 9.2, LSD = 765 lb.