



Replicated Irrigated Cotton Variety Demonstration, Seminole, TX - 2006

Cooperator: Shelby Elam

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Summary: Significant differences were observed for most parameters measured (Tables 1 and 2). Lint turnout ranged from 22.9% to 26.7% for Americot 1622B2RF and Deltapine 147RF, respectively. Lint yields varied with a low of 562 lb/acre (Americot 1622B2RF) and a high of 778 lb/acre (Stoneville 4554B2RF). Lint loan values ranged from a low of \$0.5448/lb (Deltapine 143B2RF) to a high of \$0.5852/lb (Fibermax 9063B2F). After adding lint and seed value, total value/acre ranged from a low of \$384.79 for Americot 1622B2RF to a high of \$516.58 for Stoneville 4554B2RF. When subtracting ginning and seed/technology costs, the net value/acre among varieties ranged from a high of \$391.41 (Stoneville 4554B2RF) to a low of \$275.41 (Americot 1622B2RF), a difference of \$116.00. Significant differences were observed among varieties for all lint quality parameters measured. These data indicate that substantial differences can be obtained in terms of net value/acre due to variety and technology selection.

Objective: The objective of this project was to compare yields, gin turnout, fiber quality, and economics of transgenic varieties under irrigated production systems.

Materials and Methods:

Varieties: Deltapine 147RF, Stoneville 4554B2RF, FiberMax 9063B2F, Beltwide Cotton Genetics 4630B2F, Americot 1532B2RF, Americot 1622B2RF, FiberMax 9058F, Deltapine 143 B2RF

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3.75 seed per row-ft in 40-inch row spacing

Plot size: 4 rows by length of field (2640 ft long)

Planting date: 23-May

Weed management: Treflan was applied preplant incorporated at 1.0 pt/acre. Glyphosate herbicide was applied over-the-top at 30 oz/acre with 1.25 pts/acre Treflan on 1-June . The test was later post-directed with glyphosate on 18-June at a rate of 30 oz/acre with ammonium sulfate (17 lbs/100 gallons of spray mix). Aim at a rate of 1.0 oz/acre was applied with the glyphosate application on 18-June.

Rainfall and Irrigation: According to personal communication with cooperator, 5.0 inches of rainfall accumulated during the summer and 10.0 inches of irrigation were applied during the growing season, for a total of 15.0 inches.

Insecticides: Temik was applied at in-furrow at planting at 4.5 lb/acre. No other insecticides were applied at this site. This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.

Fertilizer management: 300 lb/acre of 4-11-10 (12 lb N, 33 lb P₂O₅, and 30 lb K₂O) and 60 lb/acre of 28-0-0-5 (16.8 lb N) were applied pre-plant on 3-April.

Plant growth regulators: No plant growth regulators were used at this testing site during the growing season.

Harvest aids: Prep at 1.0 qt/acre with Aim at 1.0 pz/acre were applied on 10-October.

Harvest: Plots were harvested on 08-November using a commercial John Deere 7445 stripper harvester with field cleaner. Harvested material was transferred into a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were adjusted to lb/acre.

Gin turnout: Grab samples were taken by plot and ginned at the Texas A&M University Agricultural Research and Extension Center at Lubbock to determine gin turnouts.

Fiber analysis: Lint samples were submitted to the International Textile Center at Texas Tech University for HVI analysis, and Commodity Credit Corporation (CCC) loan values were determined for each variety by plot.

Ginning cost and seed values: Ginning costs were based on \$2.45 per cwt. of bur cotton and seed value/acre was based on \$125/ton of seed. Ginning costs did not include checkoff.

Seed and technology cost: Seed and technology costs were calculated using the appropriate seeding rate (seed/row-ft) for the row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet with Monsanto Cap Cost Thresholds. available at: <http://www.plainscotton.org/Seed/seedindex.html>

Results and Discussion:

Significant differences were observed for most parameters measured (Tables 1 and 2). Lint turnout ranged from 22.9% to 26.7% for Americot 1622B2RF and Deltapine 147RF, respectively. Lint yields varied with a low of 562 lb/acre (Americot 1622B2RF) and a high of 778 lb/acre (Stoneville 4554B2RF). Lint loan values ranged from a low of \$0.5448/lb (Deltapine 143B2RF) to a high of \$0.5852/lb (Fibermax 9063B2F). After adding lint and seed value, total value/acre ranged from a low of \$384.79 for Americot 1622B2RF to a high of \$516.58 for Stoneville 4554B2RF. When subtracting ginning and seed/technology costs, the net value/acre among varieties ranged from a high of \$391.41 (Stoneville 4554B2RF) to a low of \$275.41 (Americot 1622B2RF), a difference of \$116.00. Two varieties were in the statistical upper tier for net value. One variety contained Bollgard II with Roundup Ready Flex technology (Stoneville 4554B2RF) and the other was Roundup Ready Flex only (Deltapine 147RF). Micronaire values ranged from a low of 4.0 for Deltapine 143B2RF to a high of 4.8 for Stoneville 4554B2RF. Staple length averaged 36.8 across all varieties with a low of 35.7 for Stoneville 4554B2RF and a high of 37.8 for Fibermax 9063B2F. Uniformity was highest for Americot 1622B2RF (83.2%) and lowest for Deltapine 143B2RF (80.3%). A test average strength of 27.6 g/tex was observed with a high of 31.1 g/tex (FiberMax 9063B2F) and a low of 24.9 g/tex (Americot 1532B2RF). Percent elongation ranged from a high of 7.6 to a low of 5.4 for Stoneville 4554B2RF and FiberMax 9058F, respectively. The highest average leaf grade (4.3) was observed for Deltapine 143B2RF and the lowest (3.0) was observed for four varieties. Test averages for reflectance (Rd) and yellowness (+b) were 80.8 and 8.0, respectively. Color grades were mostly 21's and 31's at this location. These data indicate that substantial differences can be obtained in terms of net value/acre due to variety and technology selection. It should be noted no inclement weather was encountered at this location prior to harvest. Additional multi-site and multi-year applied research is needed to evaluate varieties and technology across a series of environments.

Acknowledgments:

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Table 1. Harvest results from the low input irrigated replicated transgenic cotton variety demonstration, Shelby Elam Farm, Seminole, TX, 2006.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/technology cost	Net value
	%	%	lb/acre	lb/acre	lb/acre	\$/lb	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre
Stoneville 4554B2RF	26.2	39.4	2979	778	1171	0.5693	443.43	73.16	516.58	72.98	52.20	391.41 a
Deltapine 147RF	26.7	41.8	2625	699	1093	0.5605	391.96	68.31	460.27	64.31	44.70	351.27 ab
Deltapine 143B2RF	25.8	40.9	2720	703	1116	0.5448	383.55	69.74	453.29	66.63	53.56	333.10 cb
FiberMax 9058F	26.4	38.4	2383	633	919	0.5765	364.77	57.42	422.19	58.38	39.54	324.28 cb
FiberMax 9063B2F	25.9	40.2	2383	616	958	0.5852	360.53	59.86	420.39	58.38	48.56	313.45 bcd
Beltwide Cotton Genetics 4630B2F	25.7	40.3	2465	633	994	0.5707	360.30	62.11	422.41	60.40	51.47	310.54 bcd
Americot 1532B2RF	25.4	39.9	2417	615	966	0.5685	349.87	60.37	410.24	59.21	49.15	301.88 cd
Americot 1622B2RF	22.9	41.1	2458	562	1009	0.5723	321.71	63.08	384.79	60.23	49.15	275.41 d
Test average	25.6	40.3	2554	655	1028	0.5685	372.02	64.26	436.27	62.56	48.54	325.17
CV, %	4.6	3.9	4.5	5.8	5.4	2.1	6.7	5.4	6.4	4.5	--	8.1
OSL	0.0372	0.2853	0.0002	0.0002	0.0007	0.0373	0.0018	0.0008	0.0019	0.0002	--	0.0042
LSD	2.1	NS	200	66	98	0.0207	43.42	6.12	48.95	4.90	--	46.21

For net value/acre, means within a column with the same letter are not significantly different at the 0.05 probability level.

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.05 level, NS - nonsignificant.

Note: some columns may not add up due to rounding error.

Assumes:

\$2.45/cwt ginning cost.

\$125/ton for seed.

Value for lint based on CCC loan value from grab samples and ITC HVI results.

Table 2. HVI fiber property results from the low input irrigated replicated transgenic cotton variety demonstration, Shelby Elam Farm, Seminole, TX, 2006.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Stoneville 4554B2RF	4.8	35.7	82.7	30.0	7.6	3.3	79.5	8.6	2	1
Deltapine 147RF	4.1	36.7	81.2	27.6	5.5	3.7	80.2	7.9	3	1
Deltapine 143B2RF	4.0	37.0	80.3	26.6	6.2	4.3	80.1	7.7	3	1
FiberMax 9058F	4.4	36.9	81.6	27.8	5.4	3.0	81.1	7.8	2	1
FiberMax 9063B2F	4.6	37.8	82.6	31.1	5.6	3.0	82.2	7.6	2	1
Beltwide Cotton Genetics 4630B2F	4.3	36.3	82.3	25.3	7.0	3.0	80.7	8.2	2	1
Americot 1532B2RF	4.1	36.3	81.1	24.9	7.0	3.0	81.2	8.2	2	1
Americot 1622B2RF	4.2	37.7	83.2	27.4	6.7	3.3	81.3	7.7	2	1
Test average	4.3	36.8	81.9	27.6	6.4	3.3	80.8	8.0	2.3	1.0
CV, %	3.4	1.4	0.7	3.6	5.2	12.2	0.7	2.7	--	--
OSL	<0.0001	0.0027	0.0002	<0.0001	<0.0001	0.0131	0.0007	0.0006	--	--
LSD	0.3	0.9	0.9	1.7	0.6	0.7	0.9	0.4	--	--

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.05 level.