



Replicated Irrigated Cotton Variety Demonstration, Sunray, TX - 2006

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Summary: Significant differences were observed for most parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 23.0% to 28.5% for AFD 5065B2F and Paymaster 2140B2RF, respectively. Lint yields varied with a low of 1379 lb/acre (AFD 5065B2F) and a high of 1694 lb/acre (Paymaster 2140B2RF). Lint loan values ranged from a low of \$0.4558/lb (Americot 1521B2RF) to a high of \$0.5168/lb (Beltwide Cotton Genetics 3255B2F). After adding lint and seed value, total value/acre ranged from a low of \$850.32 for Americot 1521B2RF to a high of \$1049.63 for FiberMax 9063B2F. When subtracting ginning and seed/technology costs, the net value/acre among varieties ranged from a high of \$836.72 (FiberMax 9063B2F) to a low of \$645.89 (Americot 1521B2RF), a difference of \$190.83. 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 cotton varieties under irrigated production systems.

Materials and Methods:

Varieties: Paymaster 2140B2RF, Beltwide Cotton Genetics 3255B2F, FiberMax 9063B2F, Americot 1521B2RF, AFD 5065B2RF, and Deltapine X04V334F.

Experimental design: Randomized complete block with 3 replications

Seeding rate: 4.1 seed per row-ft in 30-inch row spacing

Plot size: 8 rows by variable length of field (~800-900 ft long).

Planting date: 16-May

Weed management: Prowl H2O was applied preplant incorporated at 4.0 pt/acre. Roundup Weather Max herbicide was applied over-the-top on 27-May and 14-July at a rate of 32 oz/acre with ammonium sulfate (17 lbs/100 gallons of spray mix). Dual Magnum at a rate of 1.3 pts/acre was applied with the acephate and Pentia application on 10-June.

Rainfall and Irrigation: According to personal communication with cooperators, 11.4 inches of rainfall accumulated during the growing season in addition to 8.0 inches of irrigation, for a total of 19.4 inches.

Insecticides: Temik was applied in-furrow at planting at 3.5 lb/acre. Acephate was applied at a rate of 3.0 oz/acre on 10-June with the Pentia and Dual Magnum application.

Fertilizer management: 150 lb/acre of 11-52-0 dry fertilizer (16.5 lb N and 78 lb P₂O₅/acre) were applied pre-plant on 3-April. Another 20 gal/acre application of 32-0-0 (70.8 lb N/acre) was applied via fertigation.

Plant growth regulators: Pentia was applied at a rate of 4 oz/acre on 10-June with the acephate and Dual Magnum application.

Harvest aids: A tank mix of Ethephon 6 at 1.0 pt/acre and Def 6 at 1.0 pt/acre was applied on 10-October.

Harvest: Plots were harvested on 16-November using a commercial John Deere 7460 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 a low of 23.0% to 28.5% for AFD 5065B2F and Paymaster 2140B2RF, respectively. Lint yields varied with a low of 1379 lb/acre (AFD 5065B2F) and a high of 1694 lb/acre (Paymaster 2140B2RF). Lint loan values ranged from a low of \$0.4558/lb (Americot 1521B2RF) to a high of \$0.5168/lb (Beltwide Cotton Genetics 3255B2F). After adding lint and seed value, total value/acre ranged from a low of \$850.32 for Americot 1521B2RF to a high of \$1049.63 for FiberMax 9063B2F. When subtracting ginning and seed/technology costs, the net value/acre among varieties ranged from a high of \$836.72 (FiberMax 9063B2F) to a low of \$645.89 (Americot 1521B2RF), a difference of \$190.83. Four varieties were in the statistical upper tier for net value (\$/acre). Micronaire values ranged from a low of 2.4 for Americot 1521B2RF to a high of 3.1 for Paymaster 2140B2RF. Staple averaged 37.9 across all varieties with a low of 36.8 for Paymaster 2140B2RF and a high of 40.3 for FiberMax 9063B2F. Uniformity was highest for FiberMax 9063B2F (82.5%) and lowest for Americot 1521B2RF (80.1%). A test average strength of 27.0 g/tex was observed with a high of 30.7 g/tex (FiberMax 9063B2F) and a low of 24.1 g/tex (Americot 1521B2RF). Percent elongation values ranged from a high of 7.3 to a low of 6.1 for Beltwide Cotton Genetics 3255B2F and Deltapine X04V344F, respectively. The highest average leaf grade (5.7) was observed for Paymaster 2140B2RF and the lowest (3.0) for Beltwide Cotton Genetics 3255B2RF. Test averages for reflectance (Rd) and yellowness (+b) were 82.4 and 6.7, respectively. Color grades were mostly 31's and with some 21's and 11'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 irrigated replicated transgenic cotton variety demonstration, Kerry Cartrite Farm, Sunray, 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
FiberMax 9063B2F	27.2	52.6	6186	1685	3252	0.5035	846.41	203.22	1049.63	151.57	61.34	836.72 a
Beltwide Cotton Genetics 3255B2F	27.5	53.6	5784	1588	3102	0.5168	821.94	193.86	1015.80	141.70	65.60	808.50 a
Deltapine X04V344F	24.8	51.8	6281	1555	3255	0.5032	782.24	203.46	985.71	153.88	51.91	779.91 a
Paymaster 2140B2RF	28.5	53.0	5951	1694	3152	0.4600	779.19	196.99	976.18	145.81	60.91	769.46 a
AFD 5065B2F	23.0	53.7	6006	1379	3223	0.4830	666.01	201.43	867.45	147.15	56.07	664.22 b
Americot 1521B2RF	24.9	52.5	5806	1446	3050	0.4558	659.71	190.60	850.32	142.24	62.19	645.89 b
Test average	26.0	52.9	6002	1558	3172	0.4871	759.25	198.26	957.51	147.06	59.67	750.78
CV, %	4.8	2.0	2.8	2.9	2.8	5.2	6.0	2.8	5.1	2.8	---	6.2
OSL	0.0024	0.3419	0.0254	<0.0001	0.0818	0.0692	0.0018	0.0816	0.0025	0.0253	---	0.0022
LSD	2.3	NS	307	81	132 [†]	0.0375 [†]	82.78	8.22 [†]	88.19	7.53	---	84.12

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, [†] denotes LSD at the 0.10 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 irrigated replicated transgenic cotton variety demonstration, Kerry Cartrite Farm, Sunray, 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
FiberMax 9063B2F	2.8	40.3	82.5	30.7	6.3	3.3	84.1	6.8	1.7	1.0
Beltwide Cotton Genetics 3255B2F	2.9	37.6	82.2	24.8	7.3	3.0	84.2	7.1	2.0	1.0
Deltapine X04V344F	2.9	36.9	80.8	25.7	6.1	4.0	80.5	7.3	3.0	1.0
Paymaster 2140B2RF	3.1	36.8	82.0	28.2	7.2	5.7	79.5	5.9	3.0	1.0
AFD 5065B2F	2.8	38.1	81.4	28.6	7.2	3.7	81.9	6.5	3.0	1.0
Americot 1521B2RF	2.4	37.4	80.1	24.1	7.0	3.3	84.0	6.9	2.0	1.0
Test average	2.8	37.9	81.5	27.0	6.9	3.8	82.4	6.7	2.4	1.0
CV, %	8.5	1.3	1.1	2.1	4.4	17.2	1.2	3.4	--	--
OSL	0.0660	<0.0001	0.0601	<0.0001	0.0020	0.0065	0.0005	0.0002	--	--
LSD	0.4 [†]	0.9	1.3 [†]	1.0	0.5	1.2	1.8	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, [†] denotes LSD at the 0.10 level.