



Replicated LESA Irrigated Cotton Variety Research Trial

Cooperator: Froese Farms

**Manda Anderson, Extension Agent - IPM
Dr. Mark Kelley, Extension Agronomist - Cotton**

Gaines County

Summary: Significant differences were observed for all yield, economic, and HVI fiber quality parameters measured. Lint turnout ranged from a low of 26.1% and a high of 31.8% for NexGen 4010B2RF and FiberMax 9170B2F, respectively. Lint yield varied with a low of 337 lb/acre (NexGen 4010B2RF) and a high of 456 (PhytoGen 499WRF). Lint loan values ranged from a low of \$0.4875/lb (Deltapine 174RF) to a high of \$0.5268/lb (NexGen 4010B2RF). Net value/acre among varieties ranged from a high of \$232.22 (PhytoGen 499WRF) to a low of \$165.93 (FiberMax 2989GLB2), a difference of \$66.29. Micronaire values ranged from a low of 4.3 for NexGen 4012B2RF to a high of 4.9 for Deltapine 1044B2RF and FiberMax 2989GLB2. Staple averaged 32.4 across all varieties with a low of 31.6 for All-Tex EdgeB2RF and a high of 33.3 for NexGen 4010B2RF and FiberMax 2484B2F. Percent uniformity ranged from a high of 81.2% for NexGen 4010B2RF to a low of 78.0% for All-Tex EdgeB2RF. Strength values averaged 28.6 g/tex with a high of 31.3 g/tex for PhytoGen 499WRF and a low of 26.6 g/tex for All-Tex DineroB2RF. These data indicate that differences can be obtained in terms of net value/acre due to variety and technology selection. However, the environmental conditions prior to and during the growing season were a major limiting factor in the varieties performance overall.

Objective: The objective of this project was to compare agronomic characteristics, yields, gin turnout, fiber quality, and economic returns of transgenic cotton variety under irrigated production in Gaines County.

Materials and Methods:

Varieties: All-Tex EdgeB2RF, All-Tex DineroB2RF, Deltapine 1044B2RF, Deltapine 174RF, FiberMax 2484B2F, FiberMax 2989GLB2, FiberMax 9170B2F, NexGen 4010B2RF, NexGen 4012B2RF, PhytoGen 367WRF, PhytoGen 499WRF, Stoneville 4288B2F

Experimental design: Randomized complete block with 3 replications

Seeding rate: 2.5 seeds/row-ft in 36-inch row spacing

Plot size: 8 rows by variable length of field (455ft to 2426ft long)

Planting date: 13-May

Irrigation: This location was under a LESA center pivot.

Harvest: Plots were harvested on 10-October using a commercial picker harvester. Harvest 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 AgriLife Research and Extension Center at Lubbock to determine gin turnouts.

Fiber Analysis: Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis, and USDA Commodity Credit Corporation (CCC) Loan values were determined for each variety by plot.

Ginning cost and seed values: Ginning costs were based on \$3.00 per cwt. of bur cotton and seed value/acre was based on \$300/ton. Ginning costs did not include checkoff.

Seed and technology fees: Seed and technology costs were calculated using the appropriate seeding rate (2.5 seed/row-ft) for the 36 row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: <http://www.plainscotton.org/Seed/PCGseed10.xls>

Results and Discussion:

Significant differences were observed for all yield, economic, and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 26.1% and a high of 31.8% for NexGen 4010B2RF and FiberMax 9170B2F, respectively. Seed turnout ranged from a high of 50.2% for All-Tex EdgeB2F to a low of 42.4% for PhytoGen 499WRF. Bur cotton yields averaged 1263 lb/acre with a high of 1527 lb/acre for Deltapine 1044B2RF, and a low of 1119 lb/acre for FiberMax 2989GLB2. Lint yield varied with a low of 337 lb/acre (NexGen 4010B2RF) and a high of 456 (PhytoGen 499WRF). Lint loan values ranged from a low of \$0.4875/lb (Deltapine 174RF) to a high of \$0.5268/lb (NexGen 4010B2RF). After adding lint and seed value, total value/acre for varieties

ranged from a low of \$251.48 for FiberMax 2989GLB2 to a high of \$326.70 for PhytoGen 499WRF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$232.22 (PhytoGen 499WRF) to a low of \$165.93 (FiberMax 2989GLB2), a difference of \$66.29.

Micronaire values ranged from a low of 4.3 for NexGen 4012B2RF to a high of 4.9 for Deltapine 1044B2RF and FiberMax 2989GLB2. Staple averaged 32.4 across all varieties with a low of 31.6 for All-Tex EdgeB2RF and a high of 33.3 for NexGen 4010B2RF and FiberMax 2484B2F. Percent uniformity ranged from a high of 81.2% for NexGen 4010B2RF to a low of 78.0% for All-Tex EdgeB2RF. Strength values averaged 28.6 g/tex with a high of 31.3 g/tex for PhytoGen 499WRF and a low of 26.6 g/tex for All-Tex DineroB2RF. Elongation ranged from a high of 10.5% for Deltapine 1044B2RF to a low of 7.1% for FiberMax 2989GLB2. Leaf grades ranged from 1 to 3, with a test average of 2.2. Values for reflectance (Rd) and yellowness (+b) averaged 77.6 and 10.1, respectively.

Conclusions:

These data indicate that differences can be obtained in terms of net value/acre due to variety and technology selection. During the 2011 growing season Gaines County experienced above normal temperatures and very little rainfall. The environmental conditions prior to and during the growing season were a limiting factor in the varieties performance overall. It should be noted that no inclement weather was encountered at this location prior to harvest and therefore, no pre-harvest losses were observed. Additional multi-site and multi-year applied research is needed to evaluate varieties and technology across a series of environments.

Acknowledgements:

Appreciation is expressed to Froese Farms for the use of his land, equipment and labor for this demonstration.

Disclaimer Clause:

Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Table 1. Harvest results from the Cotton Variety Trial Under Center Pivot Irrigation, Froese Farms, Seminole, TX, 2011.

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 -----			
PhytoGen 499WRF	30.2	42.4	1507	456	639	0.5063	230.79	95.91	326.70	45.21	49.27	232.22 a
Deltapine 1044B2RF	28.3	44.0	1527	432	672	0.5005	216.44	100.76	317.19	45.82	46.81	224.56 a
PhytoGen 367WRF	29.6	44.1	1413	419	623	0.4943	207.04	93.52	300.56	42.38	49.27	208.90 ab
NexGen 4012B2RF	30.1	49.7	1212	365	602	0.5032	183.76	90.27	274.02	36.35	43.80	193.87 bc
Deltapine 174RF	30.6	43.1	1266	388	546	0.4875	188.95	81.96	270.91	37.99	41.03	191.89 bc
FiberMax 9170B2F	31.8	49.5	1151	366	570	0.5135	188.02	85.46	273.48	34.52	49.78	189.18 bcd
FiberMax 2484B2F	31.4	48.1	1126	354	542	0.5252	185.99	81.27	267.26	33.79	49.78	183.69 bcd
NexGen 4010B2RF	26.1	45.5	1292	337	588	0.5268	177.55	88.19	265.74	38.77	43.80	183.17 cd
All-Tex Edge B2RF	29.4	50.2	1196	352	600	0.4892	172.00	90.04	262.04	35.88	46.44	179.72 cd
All-Tex Dinero B2RF	31.2	49.5	1128	352	558	0.4982	175.48	83.76	259.24	33.84	46.44	178.96 cd
Stoneville 4288B2F	28.2	47.3	1216	343	575	0.4963	170.05	86.21	256.26	36.48	49.78	170.01 cd
FiberMax 2989GLB2	30.5	48.6	1119	341	545	0.4975	169.81	81.68	251.48	33.58	51.98	165.93 d
Test average	29.8	46.8	1263	375	588	0.5032	188.82	88.25	277.07	37.88	47.35	191.84
CV, %	3.1	2.1	6.3	6.4	6.3	2.4	6.4	6.3	6.3	6.3	--	7.9
OSL	<0.0001	<0.0001	<0.0001	<0.0001	0.0045	0.0061	<0.0001	0.0046	0.0002	<0.0001	--	0.0004
LSD	1.6	1.7	134	41	63	0.0200	20.36	9.39	29.71	4.02	--	25.69

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.

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

Assumes:

\$3.00/cwt ginning cost.

\$300/ton for seed.

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

Table 2. HVI fiber property results from the Cotton Variety Trial Under Center Pivot Irrigation, Froese Farms, Seminole, TX, 2010.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
All-Tex Dinero B2RF	4.4	32.0	79.3	26.6	8.6	1.3	78.6	9.9	1.3	1.3
All-Tex Edge B2RF	4.5	31.6	78.0	26.9	8.2	3.7	77.8	9.2	2.3	1.0
Deltapine 1044B2RF	4.9	32.4	79.3	30.7	10.5	2.7	77.6	10.3	1.3	2.0
Deltapine 174RF	4.8	31.7	78.2	27.0	8.7	2.3	76.0	10.5	2.0	2.0
FiberMax 2484B2F	4.5	33.3	79.4	28.7	7.9	1.7	79.8	9.4	1.0	1.0
FiberMax 2989GLB2	4.9	32.9	79.4	28.5	7.1	1.7	77.7	10.0	1.7	1.7
FiberMax 9170B2F	4.5	32.6	79.4	28.0	8.2	1.3	80.4	9.4	1.0	1.0
NexGen 4010B2RF	4.4	33.3	81.2	31.2	9.0	2.3	76.6	10.5	2.0	2.0
NexGen 4012B2RF	4.3	32.6	79.7	27.8	7.6	2.3	77.1	10.1	1.7	2.0
PhytoGen 367WRF	4.4	31.9	78.4	28.5	9.9	1.7	76.3	10.9	1.3	2.0
PhytoGen 499WRF	4.6	32.3	80.5	31.3	10.4	3.0	77.0	10.3	1.7	2.0
Stoneville 4288B2F	4.6	32.1	79.6	27.7	8.8	2.3	76.6	10.4	2.0	2.0
Test average	4.6	32.4	79.4	28.6	8.7	2.2	77.6	10.1	1.6	1.7
CV, %	1.5	1.7	1.0	3.4	2.4	38.6	0.9	1.5	--	--
OSL	<0.0001	0.0113	0.0019	<0.0001	<0.0001	0.0709†	<0.0001	<0.0001	--	--
LSD	0.1	1.0	1.3	1.6	0.4	1.2	1.2	0.3	--	--

CV - coefficient of variation.

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

LSD - least significant difference at the 0.05 level, †indicates significance at the 0.10 level.