



Replicated LESA Supplemental (Limited) Irrigation Cotton Variety Research Trial - 2012

Cooperator: Chevront Farms

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Gaines County

Summary Significant differences were observed for all yield, economic, and some HVI fiber quality parameters measured. Lint turnout ranged from a low of 30.9% and a high of 36.2% for All-Tex Nitro-44 B2RF and PhytoGen 499WRF, respectively. Lint yield varied with a low of 258 lb/acre (FiberMax 2989GLB2) and a high of 326 lb/acre (PhytoGen 499WRF). Lint loan values ranged from a low of \$0.4738/lb (FiberMax 2989GLB2) to a high of \$0.5355/lb (All-Tex Nitro-44 B2RF). Net value/acre among varieties ranged from a high of \$134.62 (PhytoGen 499WRF) to a low of \$81.71 (FiberMax 2989GLB2), a difference of \$52.91. Micronaire values ranged from a low of 4.2 for All-Tex Nitro-44 B2RF to a high of 4.9 for FiberMax 2989GLB2. Staple averaged 32.4 across all varieties with a low of 30.6 for FiberMax 2989GLB2 and a high of 33.7 for All-Tex Nitro-44 B2RF. Strength values averaged 27.7 g/tex with a high of 30.5 g/tex for All-Tex Nitro-44 B2RF and a low of 24.1 g/tex for FiberMax 2989GLB2. These data indicate that 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 agronomic characteristics, yields, gin turnout, fiber quality, and economic returns of transgenic cotton variety under supplemental irrigated production in Gaines County.

Materials and Methods

Varieties: All-Tex Nitro-44 B2RF, Deltapine 1044B2RF, FiberMax 2484B2F,
FiberMax 2989GLB2, NexGen 1511B2RF, PhytoGen 499WRF

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3 seeds/row-ft in 36-inch row spacing

Plot size: 6 rows by variable length of field (712ft to 1744ft long)

Planting date: 17-May

Soil Texture: Sandy

- Irrigation:** This location was under a LESA center pivot. This trial received approximately 9.1 inches of irrigation and rainfall throughout the growing season.
- Harvest:** Plots were harvested on 22-October using a commercial stripper 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 A&M AgriLife Research and Extension Center at Lubbock to determine gin turnovers.
- 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 \$250/ton. Ginning costs did not include checkoff.
- Seed and technology fees:** Seed and technology costs were calculated using the appropriate seeding rate (3 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/PCGseed12.xls>

Results and Discussion

Significant differences were observed for all yield, economic, and some HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 30.9% and a high of 36.2% for All-Tex Nitro-44 B2RF and PhytoGen 499WRF, respectively. Seed turnout ranged from a high of 49.6% for FiberMax 2989GLB2 to a low of 46.5% for Deltapine 1044B2RF. Bur cotton yields averaged 863 lb/acre with a high of 911 lb/acre for All-Tex Nitro-44 B2RF, and a low of 754 lb/acre for FiberMax 2989GLB2. Lint yield varied with a low of 258 lb/acre (FiberMax 2989GLB2) and a high of 326 lb/acre (PhytoGen 499WRF). Seed yield ranged from a high of 425 lb/acre for All-Tex Nitro-44 B2RF to a low of 373 lb/acre for FiberMax 2989GLB2. Lint loan values ranged from a low of \$0.4738/lb (FiberMax 2989GLB2) to a high of \$0.5355/lb (All-Tex Nitro-44 B2RF). After adding lint and seed value, total value/acre for varieties ranged from a low of \$169.01 for FiberMax 2989GLB2 to a high of \$225.42 for PhytoGen 499WRF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$134.62 (PhytoGen 499WRF) to a low of \$81.71 (FiberMax 2989GLB2), a difference of \$52.91.

Micronaire values ranged from a low of 4.2 for All-Tex Nitro-44 B2RF to a high of 4.9 for FiberMax 2989GLB2. Staple averaged 32.4 across all varieties with a

low of 30.6 for FiberMax 2989GLB2 and a high of 33.7 for All-Tex Nitro-44 B2RF. Strength values averaged 27.7 g/tex with a high of 30.5 g/tex for All-Tex Nitro-44 B2RF and a low of 24.1 g/tex for FiberMax 2989GLB2. Elongation ranged from a high of 8.2% for NexGen 1511B2RF to a low of 5.6% for FiberMax 2484B2RF. Values for reflectance (Rd) and yellowness (+b) averaged 78.2 and 9.1, respectively.

Conclusions

These data indicate that differences can be obtained in terms of net value/acre due to variety and technology selection. During the 2012 growing season Gaines County experienced high 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

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Table 1. Harvest results from the Supplemental (Limited) Irrigation Trial, Chevront Farms Farm, Seminole, TX, 2012.

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	36.2	46.6	900	326	420	0.5302	172.92	52.51	225.42	27.01	63.79	134.62 a
NexGen 1511B2RF	36.2	46.9	891	322	418	0.4897	157.79	52.29	210.08	26.73	58.29	125.05 ab
All-Tex Nitro-44 B2RF	30.9	46.7	911	281	425	0.5355	150.63	53.17	203.80	27.32	60.17	116.31 bc
Deltapine 1044B2RF	32.4	46.5	892	289	415	0.5027	145.19	51.85	197.04	26.75	59.65	110.64 bc
FiberMax 2484B2F	34.4	47.2	829	285	391	0.5155	146.89	48.86	195.75	24.86	63.34	107.55 c
FiberMax 2989GLB2	34.2	49.6	754	258	373	0.4738	122.32	46.69	169.01	22.61	64.69	81.71 d
Test average	34.0	47.3	863	294	407	0.5079	149.29	50.89	200.18	25.88	61.66	112.65
CV, %	3.9	2.5	4.6	4.5	4.5	5.1	4.6	4.5	4.6	4.6	--	7.1
OSL	0.0034	0.0794†	0.0044	0.0006	0.0366	0.098†	0.0001	0.0372	0.0005	0.0043	--	0.0002
LSD	2.4	1.7	72	24	33	0.0383	12.46	4.18	16.63	2.15	--	14.50

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, † indicates significance at the 0.10 level.

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

Assumes:

\$3.00/cwt ginning cost.

\$250/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 Supplemental (Limited) Irrigation Trial, Chevront Farms Farm, Seminole, TX, 2012.

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 Nitro-44 B2RF	4.2	33.7	79.7	30.5	7.1	2.7	78.3	9.0	2.0	1.0
NexGen 1511B2RF	4.6	30.8	78.3	26.6	8.2	2.0	76.9	9.5	2.3	1.3
Deltapine 1044B2RF	4.8	32.6	78.2	28.0	8.0	1.7	78.1	9.3	2.0	1.0
FiberMax 2484B2F	4.5	33.3	78.3	27.6	5.6	2.0	80.2	8.6	2.0	1.0
FiberMax 2989GLB2	4.9	30.6	77.2	24.1	5.6	1.7	78.3	9.0	2.0	1.0
PhytoGen 499WRF	4.5	33.5	79.3	29.6	7.8	1.3	77.0	9.5	2.0	1.3
Test average	4.6	32.4	78.5	27.7	7.1	1.9	78.2	9.1	2.1	1.1
CV, %	3.7	4.4	2.2	5.9	4.7	47.0	0.4	3.1	--	--
OSL	0.0047	0.08†	0.5755	0.0087	<0.0001	0.5809	<0.0001	0.0200	--	--
LSD	0.3	2.1	NS	3.0	0.6	NS	0.6	0.5	--	--

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, NS - not significant