



2011 Irrigated Cotton Variety Demonstration near White Deer, TX

Cooperator: Dudley Pohnert

**Jody Bradford¹, Jake Becker², Brent Bean³, Rex Brandon²,
Jake Robinson², Mark Kelley⁴**

Carson County

Summary: Twelve cotton varieties were planted on May 16th at a seeding rate of 55,000 seed/A on 30 inch rows. **Cotton yields and lint quality in this trial were greatly affected by a hail storm event in mid-August.** Net value per acre ranged from a high of \$302 to a low of \$140, a difference of \$162/A. The four top varieties based on net value per acre were Deltapine 1219B2RF, NexGen 4010B2RF, PhytoGen 367WRF and NexGen 1551RF. All four varieties had net values greater than \$290/A. There was actually very little difference in lint yield between varieties in this trial, ranging from 639 lb/A to 523 lb/A. The most important factor in determining net value per acre was leaf grade. Grades varied from 4.7 to 7.3. This greatly affected the loan values which ranged from \$0.52 to \$0.24. **If leaf grade is set at 3 for all varieties there is little difference in net values between varieties, ranging from a high of \$327 to a low of \$275. Because of the hail damage and poor defoliation, care should be taken in interpreting the results of this trial.**

Objective: The objective of this project was to compare agronomic characteristics, yield, gin turnout, fiber quality, and economic returns of transgenic cotton varieties under irrigated production in the Texas Panhandle.

Materials and Methods:

Varieties: Deltapine 1219B2RF (EXP 10R011), 0912B2RF and 104B2RF; FiberMax 9103GT, 9058F, 9180B2RF and 1740B2F; PhytoGen 367WRF; NexGen 4010B2RF, 2549B2RF, 2051B2RF and 1551RF

¹ Carson County Extension Agent

² Texas AgriLife Research Assistants

³ Texas AgriLife Extension and Research Agronomist, b-bean@tamu.edu

⁴ Texas AgriLife Extension Agronomist - Cotton

Experimental design: Randomized complete block with 3 replications

Previous crop: Corn

Seeding rate: 3.2 seeds/row-ft in 30-inch row spacing (55,000 seeds/acre)

Plot Size: 8 rows by approximately 600 ft

Planting date: May 16

Rainfall/Irrigation: Approximately 4.25 inches of rainfall was received during the growing season. Field was pre-irrigated and had excellent soil moisture at planting. Approximately 8.5 inches of irrigation was applied through a LESA center pivot.

Herbicides: Three glyphosate applications were made during the growing season.

Insecticides: None

Fertilizer: 50 lb N + 35 lb P + 1 lb Zn

Plant Growth Regulators: None

Harvest aids: Prep

Harvest: Plots were harvested on December 17th using a commercial John Deere 7460 stripper harvester with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine plot weights. Plot yields were subsequently 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 Texas Tech University Fiber and Biopolymer Research Institute 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 (3.2 seed/row-ft) for the 30-inch row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: <http://www.plainscotton.org>.

Results and Discussion:

Yields in this trial were greatly affected by a hail storm that occurred in mid-August. The field was adjusted at a 82% loss. Lint yields ranged from 639 lb/A to 523 lb/A with a test average of 591 lb/A (Table 1). Loan values, however, varied greatly ranging from \$0.52/lb to \$0.24/lb. Leaf grades of the lowest loan valued varieties were 7 (Table 2). This was likely due to poor defoliation of some varieties. No harvest aid was used in this trial.

Net value per acre of varieties ranged from \$301 to \$140 for a difference of \$161 (Table 1). In this trial, those varieties that were able withstand hail damage better, and had the lowest leaf grade value, had the highest net value per acre. If better defoliation had been achieved then it would have been expected that leaf grade would have been much lower for all varieties. If a leaf value of 3 is set for all varieties, then very little difference in net value can be observed between varieties, ranging from \$327 to \$275 per acre (Table 3). **Because of the hail damage and poor defoliation, care should be taken in interpreting the results of this trial.**

It should also be noted that heat unit accumulation for the region was exceptional in 2011 and likely contributed to the ranking of these varieties. Additional multi-site and multi-year applied research is needed to evaluate varieties and technology across a series of environments.

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Table 1. Harvest results from the Cotton Variety Trial, Pohnert Farm, White Deer, 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/tech cost	Net value	
	----- % -----		----- lb/acre -----			\$/lb	----- \$/acre -----						
Deltapine 1219B2RF	36.4	48.5	1632	594	792	0.5235	310.84	118.74	429.58	48.96	79.06	301.56	a
NexGen 4010B2RF	40.4	44.6	1521	614	678	0.5082	311.89	101.75	413.64	45.63	68.82	299.19	ab
PhytoGen 367WRF	40.6	44.3	1537	623	680	0.5133	320.00	102.06	422.07	46.11	77.43	298.53	ab
NexGen 1551RF	38.2	46.6	1460	558	680	0.5152	287.59	102.06	389.65	43.80	55.43	290.42	ab
FiberMax 1740B2F	40.7	44.4	1473	599	654	0.5008	299.89	98.09	397.98	44.18	78.23	275.57	bc
FiberMax 9103GT	36.9	48.0	1417	523	680	0.5098	266.70	102.05	368.75	42.50	65.25	261.00	c
FiberMax 9180B2F	39.8	45.7	1360	541	621	0.5157	278.87	93.18	372.04	40.80	76.98	254.27	c
Deltapine 0912B2RF	41.5	44.2	1508	625	666	0.3782	236.47	99.95	336.43	45.23	79.06	212.14	d
Deltapine 104B2RF	40.5	44.5	1447	586	644	0.3517	205.97	96.66	302.63	43.41	73.56	185.66	e
NexGen 2051B2RF	38.4	46.4	1464	563	679	0.3480	195.76	101.92	297.68	43.92	68.82	184.94	e
NexGen 2549B2RF	39.9	45.9	1601	639	735	0.2432	155.47	110.20	265.67	48.02	68.82	148.82	f
FiberMax 9058F	41.3	43.5	1529	632	666	0.2430	153.66	99.90	253.55	45.88	67.90	139.77	f
Test average	39.5	45.6	1496	591	681	0.4292	251.92	102.21	354.14	44.87	71.61	237.65	
CV, %	4.0	2.9	5.0	5.0	5.0	31.2	4.9	5.0	4.9	5.0	--	6.3	
OSL	0.0078	0.0019	0.0111	0.0007	0.0006	0.0763†	<0.0001	0.0006	<0.0001	0.0113	--	<0.0001	
LSD	2.7	2.3	126	50	57	0.1877	20.72	8.61	29.22	3.78	--	25.49	

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.

Because of hail damage and poor defoliation, care should be taken interpreting the results of this trial.

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, Pohnert Farm, White Deer, TX, 2011.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inch	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Deltapine 1219B2RF	4.2	36.1	81.3	32.2	7.0	5.0	77.3	7.6	3.3	1.0
NexGen 4010B2RF	3.7	35.9	81.4	32.4	7.0	5.7	75.7	8.0	3.7	1.0
PhytoGen 367WRF	4.3	35.4	80.7	30.5	7.9	5.0	74.7	8.0	4.0	1.0
NexGen 1551RF	4.0	33.9	80.3	31.1	6.6	4.7	74.1	9.0	3.0	1.0
FiberMax 1740B2F	4.4	34.9	80.8	29.5	6.7	5.7	76.2	7.8	3.7	1.0
FiberMax 9103GT	4.1	36.1	80.7	30.7	6.4	5.3	75.5	7.8	4.0	1.0
FiberMax 9180B2F	3.8	36.1	81.1	31.9	6.5	5.3	77.8	7.4	3.3	1.0
Deltapine 0912B2RF	4.5	34.5	80.8	30.1	7.5	6.0	74.4	7.8	4.0	1.0
Deltapine 104B2RF	3.7	34.5	81.0	32.3	8.3	7.3	74.5	7.7	4.0	1.0
NexGen 2051B2RF	4.0	35.0	80.0	28.1	6.4	7.3	75.0	7.4	4.0	1.0
NexGen 2549B2RF	3.8	33.6	80.5	30.0	7.5	7.3	73.2	8.4	4.0	1.0
FiberMax 9058F	4.0	35.7	80.4	29.3	6.0	7.3	76.2	7.6	4.0	1.0
Test average	4.0	35.1	80.7	30.7	7.0	6.0	75.4	7.9	3.8	1.0
CV, %	4.6	1.4	0.8	2.5	3.1	17.3	0.7	3.9	--	--
OSL	0.0003	<0.0001	0.2681	<0.0001	<0.0001	0.0131	<0.0001	<0.0001	--	--
LSD	0.3	0.8	NS	1.3	0.4	1.8	0.9	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, NS - not significant.

Table 3. Change in net value if leaf grade for all varieties is set at 3.

Entry	Lint loan value	Lint value	Net value
	\$/lb	\$/acre	\$/acre
NexGen 2549B2RF	0.5222	333.84	327.20 a
FiberMax 9058F	0.5387	340.61	326.73 a
NexGen 4010B2RF	0.5497	337.36	324.66 a
Deltapine 12919B2RF	0.5563	330.33	321.06 ab
PhytoGen 367WRF	0.5407	337.04	315.57 abc
Deltapine 0912B2RF	0.5312	332.15	307.81 abcd
NexGen 1551RF	0.5352	298.76	301.58 abcde
FiberMax 1740B2F	0.5407	323.74	299.42 abcde
Deltapine 104B2RF	0.5297	310.22	289.91 bcde
NexGen 2051B2RF	0.5312	298.80	287.98 cde
FiberMax 9103GT	0.5430	284.05	278.35 de
FiberMax 9180B2F	0.5542	299.69	275.09 e
Test average	0.5394	318.88	304.61
CV, %	1.5	5.0	6.2
OSL	0.0011	0.0013	0.0131
LSD	0.0140	26.92	31.74

Note: Leaf grade in the original data (Table 2) varied considerably between varieties. This was likely caused by poor defoliation and may have been related to a hail storm in mid-August. In this table, leaf grade was set at 3 to better reflect differences if good defoliation had been achieved.