



**Replicated Irrigated Cotton Variety Demonstration
Under Root-Knot Nematode Pressure,
Seminole, TX - 2009**

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- Summary:** The varieties with the lowest nematode reproduction were NexGen 3348B2F with 2960 eggs, NexGen 2549B2F with 4000 eggs, Deltapine 174F with 4035 eggs, and All-Tex ApexB2F with 4311 eggs 500cm³ soil. Significant differences were observed for all yield and economic parameters, and most of the HVI fiber quality parameters measured. Lint turnout ranged from a low of 28.7% and a high of 37.0% for All-Tex ApexB2F and Dyna-Gro 2570B2F, respectively. Lint yields varied with a low of 1009 lb/acre (FiberMax 9180B2F) and a high of 1396 lb/acre (Deltapine 174F). Lint loan values ranged from a low of \$0.5313/lb (NexGen 2549B2F) to a high of \$0.5727/lb (FiberMax 9160B2F). Net value/acre among varieties ranged from a high of \$766.41 (Deltapine 174F) to a low of \$559.05 (FiberMax 9180B2F), a difference of \$207.36. Staple averaged 35.26 across all varieties with a low of 33.1 for NexGen 2549B2F and a high of 36.6 for FiberMax 9160B2F. Percent uniformity ranged from a high of 82.5% for FiberMax 9160B2F and FiberMax 9180B2F to a low of 80.7% for Deltapine 0935B2F and All-Tex ApexB2F. Strength values averaged 30.3 g/tex with a high of 32.3 g/tex for FiberMax 9180B2F and a low of 28.6 g/tex for All-Tex ApexB2F. 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 agronomic characteristics, yields, gin turnout, fiber quality, and economic returns of transgenic cotton varieties under nematode pressure in Gaines County.

Materials and Methods:

Varieties:	All-Tex ApexB2F, Deltapine 174F, DynaGro 2570B2F, FiberMax 9160B2F, FiberMax 1740B2F, FiberMax 9180B2F, Stoneville 5458B2F, Deltapine 0924B2F, Deltapine 0935B2F, NexGen 2549B2F, NexGen 3348B2F, PhytoGen 375WF
Soil Texture and pH:	93% sand, 1% silt and 6% sand; pH of 7.6
Experimental design:	Randomized complete block with 3 replications
Seeding rate:	3 seeds/row-ft in 40-inch row spacing
Plot size:	8 rows by variable length of field (833 - 2536 ft long)
Planting date:	19 May in terminated wheat
Irrigation:	This location was under a LESA center pivot
Irrigation & Rainfall:	Pre-bloom irrigation and rainfall totaled ~5.63 inches Bloom to harvest rainfall totaled ~8.15 inches
Insecticides:	No insecticides were applied
Weed Management:	1 pt of Caparol in early July and 3 applications of roundup in-season
Fertilizer Management:	200 lbs of 33-0-0-12
Plant Growth Regulators:	8 oz of pix early season
Harvest Aides:	1 qt of Prep and 2 oz of ET
Harvest:	Plots were harvested on 6 & 7-November using a commercial stripper harvester with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine individual 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 \$160/ton. Ginning costs did not include checkoff.

Seed and technology fees:

Seed and technology costs were calculated using the appropriate seeding rate (3.0 seed/row-ft) for the 40-inch 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:

Nematode reproduction was measured by the number of nematode eggs per 500cm³ soil (Table 1). The varieties with the lowest nematode reproduction were NexGen 3348B2F with 2960 eggs, NexGen 2549B2F with 4000 eggs, Deltapine 174F with 4035 eggs, and All-Tex ApexB2F with 4311 eggs.

Significant differences were observed for all yield and economic parameters, and most of the HVI fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from a low of 28.7% and a high of 37.0% for All-Tex ApexB2F and Dyna-Gro 2570B2F, respectively. Seed turnout ranged from a high of 53.3% for NexGen 2549B2F to a low of 44.6% for Deltapine 174F. Bur cotton yields averaged 3458 lb/acre with a high of 4034 lb/acre for Deltapine 174F, and a low of 3139 lb/acre for FiberMax 9180B2F. Lint yields varied with a low of 1009 lb/acre (FiberMax 9180B2F) and a high of 1396 lb/acre (Deltapine 174F). Lint loan values ranged from a low of \$0.5313/lb (NexGen 2549B2F) to a high of \$0.5727/lb (FiberMax 9160B2F). After adding lint and seed value, total value/acre for varieties ranged from a low of \$705.33 for FiberMax 9180B2F to a high of \$931.40 for Deltapine 174F. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of \$766.41 (Deltapine 174F) to a low of \$559.05 (FiberMax 9180B2F), a difference of \$207.36.

Micronaire values did not significantly differ. Staple averaged 35.26 across all varieties with a low of 33.1 for NexGen 2549B2F and a high of 36.6 for FiberMax 9160B2F. Percent uniformity ranged from a high of 82.5% for FiberMax 9160B2F and FiberMax 9180B2F to a low of 80.7% for Deltapine 0935B2F and All-Tex ApexB2F. Strength values averaged 30.3 g/tex with a high of 32.3 g/tex for FiberMax 9180B2F and a low of 28.6 g/tex for All-Tex ApexB2F. Elongation ranged from a high of 11.7% for Dyna-Gro 2570B2F to a low of 8.8% for FiberMax 9160B2F. There was no significant difference in leaf grades. Values for reflectance (Rd) and yellowness (+b) averaged 82.8 and 7.9, respectively. This resulted in color grades of 11s and 21s.

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 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.

Acknowledgments:

Appreciation is expressed to Gregory Upton for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by the Fiber and Biopolymer Research Institute, Texas Tech University.

Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Nematode reproduction from replicated nematode cotton variety demonstration, Gregory Upton Farms, Seminole, TX, 2009.

Entry	Nematode Reproduction Eggs per 500cm³ soil
DP 174F	4035
ST 5458B2F	8640
DG 2570B2F	7200
DP 0924B2F	11295
DP 0935B2F	11295
PHY 375WF	12800
FM 1740B2F	12040
FM 9160B2F	11480
NG 3348B2F	2960
NG 2549B2F	4000
AT Apex B2F	4311
FM 9180B2F	14560

Table 2. Harvest results from the replicated nematode cotton variety demonstration, Gregory Upton Farms, Seminole, TX, 2009

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		
DP 174F	34.6	44.6	4034	1396	1798	0.5645	787.58	143.82	931.40	121.02	43.96	766.41 a
ST 5458B2F	33.8	51.1	3946	1333	2017	0.5607	747.27	161.31	908.58	118.38	52.12	738.07 a
DG 2570B2F	37.0	51.5	3539	1310	1823	0.5693	745.43	145.81	891.24	106.16	50.78	734.30 a
DP 0924B2F	33.1	51.5	3708	1226	1910	0.5667	694.82	152.81	847.64	111.24	51.72	684.68 b
DP 0935B2F	36.3	49.4	3448	1249	1704	0.5547	692.07	136.35	828.42	103.44	51.72	673.26 b
PHY 375WF	35.6	49.6	3218	1144	1596	0.5663	648.69	127.71	776.40	96.53	50.76	629.11 c
FM 1740B2F	36.0	50.1	3143	1131	1575	0.5463	618.97	126.02	744.99	94.28	52.12	598.59 cd
FM 9160B2F	33.4	50.7	3222	1077	1634	0.5727	616.68	130.70	747.37	96.67	52.12	598.58 cd
NG 3348B2F	33.4	53.0	3186	1063	1687	0.5725	608.49	134.94	743.42	95.57	51.12	596.73 cd
NG 2549B2F	32.3	53.3	3351	1081	1786	0.5313	573.74	142.85	716.59	100.53	51.12	564.94 d
AT Apex B2F	28.7	51.4	3562	1021	1830	0.5612	572.82	146.40	719.21	106.85	50.70	561.66 d
FM 9180B2F	32.2	52.1	3139	1009	1635	0.5695	574.51	130.82	705.33	94.15	52.12	559.05 d
Test average	33.9	50.7	3458	1170	1750	0.5613	656.76	139.96	796.72	103.74	50.86	642.12
CV, %	3.9	4.6	3.7	3.7	3.6	2.3	3.6	3.6	3.5	3.7	--	3.8
OSL	<0.0001	0.0200	<0.0001	<0.0001	<0.0001	0.0250	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001
LSD	2.3	4.0	214	73	106	0.0219	40.01	8.50	46.94	6.42	--	41.61

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 - not significant.

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

Assumes:

\$3.00/cwt ginning cost.

\$160/ton for seed.

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

Table 3. HVI fiber property results from the replicated nematode cotton variety demonstration, Gregory Upton Farms, Seminole, TX, 2009.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
DP 174F	4.1	35.9	81.5	29.0	11.0	2.7	82.5	8.0	1.7	1.0
ST 5458B2F	4.1	35.1	81.1	31.6	10.0	3.0	80.9	8.6	2.0	1.0
DG 2570B2F	4.6	35.3	82.0	30.0	11.7	1.3	82.8	8.2	1.0	1.0
DP 0924B2F	4.2	35.2	81.9	30.6	11.0	1.7	82.8	8.1	1.3	1.0
DP 0935B2F	4.3	34.5	80.7	29.0	10.8	1.0	82.7	8.4	1.0	1.0
PHY 375WF	4.3	35.3	81.6	29.4	10.4	2.0	82.7	8.0	1.7	1.0
FM 1740B2F	4.5	34.1	80.8	30.0	10.3	1.3	83.8	7.7	1.0	1.0
FM 9160B2F	4.2	36.6	82.5	31.8	8.8	2.3	84.0	7.6	1.7	1.0
NG 3348B2F	4.3	35.8	82.2	31.5	10.0	2.0	81.6	7.6	2.3	1.0
NG 2549B2F	4.3	33.1	81.8	29.6	11.2	2.0	82.0	7.9	1.7	1.0
AT Apex B2F	3.9	35.7	80.7	28.6	10.9	2.0	83.4	8.0	1.3	1.0
FM 9180B2F	4.2	36.5	82.5	32.3	9.3	2.7	84.2	7.1	2.0	1.0
Test average	4.26	35.26	81.6	30.3	10.5	2.0	82.8	7.9	1.6	1.0
CV, %	5.5	1.6	0.9	2.1	3.8	43.7	0.8	3.0	--	--
OSL	0.1474	<0.0001	0.0471	<0.0001	<0.0001	0.2300	0.0001	<0.0001	--	--
LSD	NS	0.97	1.3	1.1	0.7	NS	1.1	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, † indicates significance at the 0.10 level, NS - not significant.