AgriLIFE EXTENSION
Texas A&M System

Replicated Irrigated Cotton Variety Demonstration Under Verticillium Wilt Pressure Seminole, TX - 2009

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Summary: Significant differences were observed for most yield and economic and HVI fiber quality parameters measured. Lint yields varied with a low of 1153 lb/acre (FiberMax 9180B2F) and a high of 1637 lb/acre (Deltapine 174F). Lint loan values ranged from a low of $0.5327/lb (NexGen 2549B2F) to a high of $0.5643/lb (Deltapine 174F). Net value/acre among varieties ranged from a high of $896.76 (Deltapine 174F) to a low of $616.91 (NexGen2549B2F), a difference of $279.85. Staple averaged 36.4 across all varieties with a low of 34.1 for NexGen 2549B2F and a high of 37.7 for FiberMax 9170B2F. Strength values averaged 30.2 g/tex with a high of 32.3 g/tex for FiberMax 9170B2F and a low of 28.2 g/tex for Americot 1532B2F. Percent uniformity and values ranged from a high of 82.8% for FiberMax 9160B2F to a low of 80.3% for Deltapine 0935B2F. 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 Verticillium Wilt pressure in Gaines County.

Materials and Methods:

Varieties: All-Tex Patriot F, Americot 1532B2F, Deltapine 174F, Deltapine 164B2F, Deltapine 0935B2F, FiberMax 9160B2F, FiberMax 9170B2F, FiberMax 9180B2F, NexGen 2549B2F, NexGen 3348B2F, Phytogen 315F

Field Soil Texture and pH:	87% sand, 3% silt, and 10% clay; pH 7.7
Experimental design:	Randomized complete block with 3 replications
Seeding rate:	3.6 seeds/row-ft in 40-inch row spacing
Plot size:	8 rows by variable length of field (0.91 acres to 1.48 acres)
Planting date:	29 April in terminated wheat
Irrigation:	This location was under LESA center pivot
Irrigation & Rainfall:	Pre-bloom irrigation and rainfall totaled ~7.10 inches Bloom to harvest rainfall totaled ~8.70 inches
Insecticides:	Applied Temik at 3.5 lbs/acre in-furrow at planting
Harvest:	Plots were harvested on 8 & 9-October 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 (3.6 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:

Significant differences were observed for most yield and economic and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout were significant at the 0.10 probability level and ranged from a low of 30.8% and a high of 35.3% for FiberMax 9180B2F and Phytogen 315F, respectively. There was no significant different in seed turnout. Bur cotton yields averaged 3850 lb/acre with a high of 4801 lb/acre for Deltapine 174F, and a low of 3623 lb/acre for Phytogen 315F. Lint yields varied with a low of 1153 lb/acre (FiberMax 9180B2F) and a high of 1637 lb/acre (Deltapine 174F). Lint loan values ranged from a low of $0.5327/lb (NexGen

2549B2F) to a high of $0.5643/lb (Deltapine 174F). After adding lint and seed value, total value/acre for varieties ranged from a low of $794.35 for NexGen 2549B2F to a high of $1093.90 for Deltapine 174F. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $896.76 (Deltapine 174F) to a low of $616.91 (NexGen2549B2F), a difference of $279.85.

Micronaire values were significant at the 0.10 probability level and ranged from a low of 3.7 for NexGen 2549B2F and NexGen 3348B2F to a high of 4.3 for Deltapine 164B2RF. Staple averaged 36.4 across all varieties with a low of 34.1 for NexGen 2549B2F and a high of 37.7 for FiberMax 9170B2F. Percent uniformity and values ranged from a high of 82.8% for FiberMax 9160B2F to a low of 80.3% for Deltapine 0935B2F. Strength values averaged 30.2 g/tex with a high of 32.3 g/tex for FiberMax 9170B2F and a low of 28.2 g/tex for Americot 1532B2F. Elongation ranged from a high of 8.9% for NexGen 2549B2F to a low of 6.6% for FiberMax 9160B2F. Although there was one 4 observed, leaf grades were 1s and 2s for most varieties. Values for reflectance (Rd) and yellowness (+b) averaged 81.9 and 8.0, respectively. This resulted in color grades of mostly 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:

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Table 1. Harvest results from the replicated Verticillium Wilt cotton variety demonstration, Max McGuire 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	34.1	44.6	4801	1637	2141	0.5643	922.64	171.27	1093.90	144.02	53.12	896.76	a
DP 164B2F	31.9	47.7	4050	1292	1933	0.5740	741.88	154.65	896.53	121.50	61.40	713.63	b
FM 9170B2F	33.9	48.1	3830	1298	1840	0.5692	739.60	147.21	886.81	114.89	62.98	708.93	b
PHY 315F	35.3	48.7	3623	1280	1765	0.5632	721.16	141.17	862.32	108.68	53.10	700.55	bc
FM 9160B2F	33.4	47.8	3655	1221	1747	0.5748	702.02	139.73	841.74	109.64	62.98	669.12	bcd
AT PatriotF	31.8	50.5	3728	1187	1882	0.5727	679.80	150.57	830.37	111.84	51.46	667.07	bcd
AM 1532B2F	32.4	48.7	3656	1186	1780	0.5710	677.06	142.35	819.42	109.68	61.77	647.97	bcd
NG 3348B2F	31.6	48.9	3739	1183	1831	0.5640	667.71	146.50	814.21	112.16	61.77	640.28	bcd
DP 0935B2F	33.4	45.9	3665	1223	1683	0.5512	674.54	134.61	809.15	109.95	62.49	636.71	bcd
FM 9180B2F	30.8	48.4	3746	1153	1811	0.5737	661.12	144.90	806.01	112.37	62.98	630.66	cd
NG 2549B2F	31.4	48.8	3856	1209	1881	0.5327	643.92	150.43	794.35	115.67	61.77	616.91	d
Test average	32.7	48.0	3850	1261	1845	0.5646	711.95	147.58	859.53	115.49	59.62	684.42	
CV, %	5.3	5.5	5.3	5.4	5.3	1.6	6.2	5.3	6.0	5.3	--	6.6	
OSL	0.0964	0.4278	<0.0001	<0.0001	0.0018	0.0004	<0.0001	0.0018	<0.0001	<0.0001	--	<0.0001	
LSD	2.4	NS	350	116	166	0.0155	74.72	13.30	87.68	10.51	--	77.48	

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 2. HVI fiber property results from the replicated Verticillium Wilt cotton variety demonstration, Max McGuire 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	37.1	82.0	30.0	7.9	2.7	81.3	8.1	2.3	1.0
DP 164B2F	4.3	37.2	81.9	30.3	7.3	1.0	83.3	8.2	1.0	1.0
FM 9170B2F	3.8	37.7	81.9	32.3	6.9	1.0	83.9	7.3	2.0	1.0
PHY 315F	3.9	35.4	81.1	29.1	8.1	2.0	81.1	8.5	2.0	1.0
FM 9160B2F	4.0	37.3	82.8	31.0	6.6	2.0	82.7	7.6	1.7	1.0
AT PatriotF	4.1	36.5	81.6	29.6	8.6	1.3	81.7	8.2	2.0	1.0
AM 1532B2F	4.0	36.1	81.9	28.2	8.6	2.0	82.2	8.1	1.7	1.0
NG 3348B2F	3.7	36.2	82.1	30.9	7.9	2.7	80.1	7.9	2.7	1.0
DP 0935B2F	3.8	35.0	80.3	29.0	8.5	1.7	82.3	8.4	1.3	1.0
FM 9180B2F	4.1	37.5	82.6	31.5	7.4	1.3	82.4	7.5	2.0	1.0
NG 2549B2F	3.7	34.1	82.6	29.8	8.9	4.0	79.6	8.0	2.3	1.0
Test average	4.0	36.4	81.9	30.2	7.9	2.0	81.9	8.0	1.9	1.0
CV, %	5.4	1.7	0.9	2.9	5.2	37.5	1.5	3.6	--	--
OSL	0.0672	<0.0001	0.0261	0.0005	<0.0001	0.0026	0.0143	0.0007	--	--
LSD	0.3	1.1	1.3	1.5	0.7	1.3	2.1	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.