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Replicated Irrigated Cotton Variety Demonstration,
Seminole, TX - 2009

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Summary: Significant differences were observed for all yield and economic and most HVI fiber quality parameters measured. Lint turnout ranged from a low of 32.5% and a high of 36.9% for NexGen 3348B2F and Deltapine 0935B2F, respectively. Lint yields varied with a low of 1140 lb/acre (NG3348B2F) and a high of 1367 lb/acre (Phytogen 375WF). Lint loan values ranged from a low of $0.5555/lb (NexGen 2549B2F) to a high of $0.5698/lb (Deltapine 174F). Net value/acre among varieties ranged from a high of $754.84 (Deltapine 174F) to a low of $636.61 (NG2549B2F), a difference of $118.23. Micronaire values ranged from a low of 4.0 for FiberMax 9160B2F and NexGen 2549B2F to a high of 4.6 for Deltapine 0924B2RF. Staple averaged 35.4 across all varieties with a low of 34.2 for Deltapine 0935B2F and a high of 36.5 for FiberMax 9180B2F and FiberMax 9160B2F. Percent uniformity ranged from a high of 82.5% for NexGen 3348B2F to a low of 80.7% for Phytogen 375WF. Strength values averaged 29.1 g/tex with a high of 31.2 g/tex for FiberMax 9180B2F and a low of 27.8 g/tex 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 irrigated production in Gaines County.

Materials and Methods:

Varieties: All-Tex Apex B2F,   Deltapine 174F, Deltapine 0935B2F, Deltapine 0924B2F DynaGro 2570B2F, FiberMax 9160B2F, FiberMax 1740B2F, FiberMax 9180B2F, NexGen 2549B2F, NexGen 3348B2F, Phytogen 375WF

Soil Texture and pH:	91% sand, 1% silt, and 8% clay; pH of 7.8
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 (1863 - 2625 ft long)
Planting date:	18 May in terminated wheat
Irrigation:	This location was under a 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 5 & 6-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 (4.0 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:

Significant differences were observed for all yield and economic and most HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 32.5% and a high of 36.9% for NexGen 3348B2F and Deltapine 0935B2F, respectively. Seed turnout ranged from a high of 52.7% for NG2549B2F to a low of 47.9% for Deltapine 174F. Bur cotton yields averaged 3636 lb/acre with a high of 3789 lb/acre for Deltapine 0924B2F, and a low of 3421 lb/acre for FiberMax 9180B2F. Lint yields varied with a low of 1140 lb/acre (NG3348B2F) and a high of 1367 lb/acre (Phytogen 375WF). Lint loan values ranged from a low of $0.5555/lb (NexGen 2549B2F) to a high of $0.5698/lb (Deltapine 174F). After adding lint and seed value, total value/acre for varieties ranged from a low of $790.81 for NexGen 2549B2F to a high of $918.58 for Dyna-Gro 2570B2F. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $754.84 (Deltapine 174F) to a low of $636.61 (NG2549B2F), a difference of $118.23.

Micronaire values ranged from a low of 4.0 for FiberMax 9160B2F and NexGen 2549B2F to a high of 4.6 for Deltapine 0924B2RF. Staple averaged 35.4 across all varieties with a low of 34.2 for Deltapine 0935B2F and a high of 36.5 for FiberMax 9180B2F and FiberMax 9160B2F. Percent uniformity ranged from a high of 82.5% for NexGen 3348B2F to a low of 80.7% for Phytogen 375WF. Strength values averaged 29.1 g/tex with a high of 31.2 g/tex for FiberMax 9180B2F and a low of 27.8 g/tex for Deltapine 0935B2F. Elongation ranged from a high of 10.0% for Dyna-Gro 2570B2F to a low of 7.2% for FiberMax 9160B2F. There was no significant different in leaf grades. Values for reflectance (Rd) and yellowness (+b) averaged 82.2 and 7.9, 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 irrigated 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	36.3	47.9	3714	1348	1780	0.5698	767.83	142.40	910.23	111.42	43.96	754.84 a
DG 2570B2F	36.1	50.6	3767	1360	1907	0.5633	766.00	152.59	918.58	113.00	50.78	754.81 a
PHY 375WF	36.5	48.6	3747	1367	1823	0.5567	760.75	145.84	906.59	112.42	50.76	743.41 a
DP 0935B2F	36.9	48.8	3680	1357	1795	0.5470	742.67	143.61	886.28	110.39	51.72	724.17 ab
FM 1740B2F	35.7	49.2	3676	1314	1808	0.5645	741.60	144.68	886.28	110.27	52.12	723.89 ab
AT Apex B2F	33.7	51.6	3713	1250	1916	0.5667	708.51	153.28	861.79	111.39	50.70	699.70 bc
DP 0924B2F	33.8	50.7	3789	1281	1919	0.5500	704.38	153.49	857.87	113.66	51.72	692.49 bc
FM 9160B2F	33.8	50.0	3546	1200	1773	0.5693	683.16	141.87	825.03	106.37	52.12	666.54 cd
FM 9180B2F	33.6	51.6	3421	1149	1764	0.5737	658.97	141.16	800.13	102.62	52.12	645.39 d
NG 3348B2F	32.5	52.1	3513	1140	1830	0.5687	648.50	146.44	794.94	105.39	51.12	638.43 d
NG 2549B2F	33.9	52.7	3436	1163	1812	0.5555	645.86	144.95	790.81	103.09	51.12	636.61 d
Test average	34.8	50.3	3636	1266	1830	0.5623	711.66	146.39	858.05	109.09	50.75	698.21
CV, %	3.8	1.6	2.7	2.7	2.7	1.7	3.4	2.7	3.2	2.7	--	3.6
OSL	0.0041	<0.0001	0.0006	<0.0001	0.0037	0.0363	<0.0001	0.0037	<0.0001	0.0006	--	<0.0001
LSD	2.2	1.4	168	59	84	0.0162	40.83	6.75	46.69	5.03	--	42.28

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 irrigated 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	36.0	81.4	28.1	9.2	1.3	81.7	8.1	2.0	1.0
DG 2570B2F	4.4	35.0	81.0	28.7	10.0	1.0	82.1	8.1	2.0	1.0
PHY 375WF	4.3	35.0	80.7	28.2	8.8	1.0	81.9	8.4	1.7	1.0
DP 0935B2F	4.5	34.2	81.0	27.8	8.8	1.3	82.6	8.3	1.7	1.0
FM 1740B2F	4.4	35.3	80.8	29.2	8.3	1.3	82.8	7.4	2.0	1.0
AT Apex B2F	4.2	35.9	81.5	28.8	8.6	1.3	82.2	8.0	2.0	1.0
DP 0924B2F	4.6	34.7	81.5	29.0	9.2	2.0	81.2	7.7	2.7	1.0
FM 9160B2F	4.0	36.5	80.7	29.1	7.2	1.3	82.7	7.4	2.0	1.0
FM 9180B2F	4.2	36.5	82.2	31.2	7.9	1.0	83.9	7.5	1.7	1.0
NG 3348B2F	4.1	36.3	82.5	30.6	8.6	2.3	80.9	8.0	2.3	1.0
NG 2549B2F	4.0	34.5	81.8	29.9	9.8	2.3	82.0	7.9	2.0	1.0
Test average	4.3	35.4	81.4	29.1	8.8	1.5	82.2	7.9	2.0	1.0
CV, %	4.2	1.8	0.6	2.7	6.6	43.7	0.8	2.5	--	--
OSL	0.0140	0.0011	0.0011	0.0007	0.0005	0.1266	0.0028	<0.0001	--	--
LSD	0.3	1.1	0.8	1.3	1.0	NS	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, NS - not significant.