

Replicated Irrigated Small Plot Roundup Ready Flex Cotton Variety Demonstration, Panhandle, TX - 2007

Cooperator: Geneo Abbe

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Summary: The difference in the highest and lowest net value among varieties at this location was \$418.16/acre, indicating the importance of variety selection. Average lint yield was excellent at 1,811 lbs/acre. Lint yield ranged from a low of 1,455 lb/acre for NexGen 1551RF to a high of 2,184 lb/acre for FiberMax 9058F. Lint loan values ranged from \$0.4730/lb for NexGen 1572RF to \$0.5789/lb for NexGen 1551RF. After subtracting out ginning and seed/technology costs, the highest net value varieties were FiberMax 9058F, (\$1,225.34/acre), NexGen 3410RF (\$1,106.81/acre), and FiberMax 9060F (\$1,082.85).

Objective: The objective of this project was to compare yields, gin turnout, fiber quality, and economics of transgenic varieties under irrigated production systems.

Materials and Methods:

Varieties: AFD 5064F, Deltapine 110RF, Deltapine 121RF, FiberMax 9058F, FiberMax 9060F, FiberMax 9068F, FiberMax 9150F, NexGen 1551RF, NexGen 1556RF, NexGen 1572RF, NexGen 3410RF, NexGen 3550RF, and PhytoGen 125RF

Experimental design: Randomized complete block with 4 replications

Seeding rate: 3.75 seed per row-ft in 30-inch row spacing (65,000 seed/acre)

Plot size: One 30 inch row by 100 ft long

Planting date: May 15

Weed management: Direx plus Dual herbicides were applied pre-emergence broadcast.

Rainfall and irrigation: A total of 9.31 inches of rainfall accumulated at this location during the growing season May 15 - Oct 31. In addition, 4.28 inches of water was applied by center pivot irrigation. Estimated soil water use

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was 4.24 inches. Total water used during the growing season (soil water/rainfall/irrigation) was 18.22 inches.

Insecticides: Temik was applied in-furrow at planting. No other insecticides were used at this site during the growing season.

Fertilizer management: 45 lb N/acre, 35 lb P₂O₅/acre, 10 lb K₂O/acre, and 22 lb S/acre were applied prior to planting.

Harvest: Plots were harvested on October 30th by hand harvesting 20 ft of row. Samples were weighed and adjusted to lb/acre.

Gin turnout: Sub-samples were collected and ginned at the Texas AgriLife Research and Extension Center near Lubbock to determine gin turnouts.

Fiber analysis: Lint samples were submitted to the International Textile Center at Texas Tech University for HVI analysis, and Commodity Credit Corporation (CCC) loan values were determined for each variety by plot.

Ginning cost and seed values: Ginning costs were based on \$2.45 per cwt. of bur cotton and seed value/acre was based on \$150/ton of seed. Ginning costs did not include checkoff.

Seed and technology cost: Seed and technology costs were calculated using the appropriate seeding rate (seed/row-ft) for the row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet with Monsanto Cap Cost Thresholds. Available at: <http://www.plainscotton.org/Seed/seedindex.html> .

Results and Discussion:

Although heat units were scarce early in the season, a warm August and September resulted in excellent cotton yields at this location. Of all the yield and quality factors measured, only seed turnout was not significantly different among varieties (Tables 1 and 2). Average lint yield was 1,811 lbs/acre and was achieved with 9.3 inches of rainfall and 4.3 inches of irrigation water. Soil moisture conditions were excellent at planting. Lint turnout averaged 26.8% with a range of 23.3% to 29.1%. Lint yield ranged from a low of 1,455 lb/acre for NexGen 1551RF to a high of 2,184 lb/acre for FiberMax 9058F. Although NexGen 1551RF had the lowest lint yield, it also had the highest lint loan value at \$0.5789/lb and the second highest micronaire at 3.8. Lowest lint loan value was observed for NexGen 1572RF at \$0.4730/lb. Total value (lint value plus seed value) ranged from \$1,005.66/acre to a high of \$1,464.60/acre and was closely correlated with net value (total value minus ginning and seed/technology cost). Net value ranged from a low of \$807.19/acre for NexGen 1572RF to a high of \$1,225.34/acre for FiberMax 9058F. The difference in the net value for these two varieties was \$418.16/acre. The net value of two varieties, NexGen 3410RF at \$1,106.81/acre, and FiberMax 9060F at \$1,082.85/acre, were

not statistically different from FiberMax 9058F (\$1,225.34/acre).

In this trial, micronaire ranged from a low of 3.0 for NexGen 1572RF to a high of 4.0 for NexGen 1556RF. The test average for micronaire was 3.4. Staple averaged 37.9 with a low of 36.3 for AFD 5064F and a high of 39.8 for FiberMax 9060F. Uniformity ranged from 80.8% to 83.4% with an average of 81.9%. Test average for strength was 29.3 g/tex with a low of 27.7 g/tex for Deltapine 121RF and a high of 32.7 g/tex for NexGen 1551RF. Percent elongation values ranged from a low of 7.7% for FiberMax 9058F to a high of 9.3% for PhytoGen 125RF. The lowest average leaf grade (2.3) was observed for FiberMax 9058F and FiberMax 9060F and the highest (5.0) for Deltapine 110RF and NexGen 1572RF. Test averages for reflectance (Rd) and yellowness (+b) were 78.5 and 8.4, respectively. Color grades were mostly 21s or 31s in this trial.

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Table 1. Harvest results from the small-plot replicated Roundup Ready Flex demonstration, Geneo Abbe Farm, Panhandle, TX, 2007.

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 -----			
FiberMax 9058F	29.1	44.6	7504	2184	3345	0.5555	1213.75	250.85	1464.60	183.86	55.40	1225.34 a
NexGen 3410RF	27.8	44.9	7361	2040	3303	0.5320	1085.60	247.70	1333.30	180.34	46.15	1106.81 ab
FiberMax 9060F	27.7	43.5	7249	2009	3146	0.5373	1079.93	235.91	1315.85	177.60	55.40	1082.85 ab
FiberMax 9068F	28.4	45.9	6630	1889	3048	0.5475	1039.16	228.56	1267.72	162.44	58.34	1046.95 bc
NexGen 3550RF	26.2	44.4	7251	1902	3214	0.5309	1009.62	241.06	1250.68	177.65	46.15	1026.88 bc
Deltapine 110RF	28.2	45.8	7146	2014	3272	0.4821	970.14	245.39	1215.54	175.06	57.71	982.77 bcd
Deltapine 121RF	28.0	42.4	6250	1752	2654	0.5628	986.41	199.02	1185.42	153.13	61.89	970.40 bcd
NexGen 1556RF	23.3	46.0	7022	1634	3228	0.5651	923.96	242.05	1166.01	172.05	46.15	947.81 bcde
FiberMax 9150F	28.4	43.9	6216	1768	2728	0.5063	896.52	204.59	1101.10	152.28	55.40	893.42 cde
PhytoGen 125RF	25.0	45.8	6608	1649	3020	0.5309	873.07	226.50	1099.58	161.90	50.02	887.66 cde
NexGen 1551RF	24.7	45.9	5888	1455	2702	0.5789	840.92	202.63	1043.55	144.26	46.15	853.13 de
AFD 5064F	25.0	44.5	6294	1573	2792	0.5268	827.77	209.43	1037.20	154.20	51.21	831.79 de
NexGen 1572RF	27.0	45.6	6217	1677	2833	0.4730	793.21	212.45	1005.66	152.32	46.15	807.19 e
Test average	26.8	44.8	6741	1811	3022	0.5330	964.62	226.62	1191.24	165.16	52.01	974.07
CV, %	4.8	5.0	7.9	9.4	8.9	5.4	11.2	8.9	10.3	7.9	--	11.6
OSL	<0.0001	0.4837	0.0005	<0.0001	0.0018	0.0002	<0.0001	0.0018	0.0001	0.0005	--	0.0002
LSD	1.9	NS	764	244	385	0.0415	154.29	28.90	176.05	18.71	--	162.73

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.

Assumes:

\$2.45/cwt ginning cost.

\$150/ton for seed.

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

Table 2. HVI fiber property results from the small-plot replicated Roundup Ready Flex demonstration, Geneo Abbe Farm, Panhandle, TX, 2007.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{hds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
AFD 5064F	3.5	36.3	81.5	30.1	8.8	4.3	77.5	8.1	2.8	1.0
Deltapine 110RF	3.3	38.3	82.8	31.4	8.8	5.0	74.8	8.7	3.5	1.3
Deltapine 121RF	3.6	36.9	82.3	27.7	9.1	2.8	78.8	9.2	2.0	1.0
FiberMax 9058F	3.3	39.0	80.8	29.0	7.7	2.3	80.5	8.2	2.3	1.0
FiberMax 9060F	3.1	39.8	81.4	28.9	7.8	2.3	80.4	8.1	2.0	1.0
FiberMax 9068F	3.3	38.7	81.6	29.7	7.9	2.5	81.2	8.0	2.0	1.0
FiberMax 9150F	3.1	38.8	81.4	28.6	7.9	4.0	77.7	7.9	3.0	1.0
NexGen 1551RF	3.8	37.6	83.4	32.7	8.2	2.8	77.7	9.2	2.3	1.0
NexGen 1556RF	4.0	37.1	83.1	29.5	8.9	3.5	76.6	9.1	2.8	1.0
NexGen 1572RF	3.0	37.9	81.3	28.1	8.6	5.0	80.0	7.5	2.8	1.0
NexGen 3410RF	3.2	38.6	81.4	28.4	8.1	3.3	78.2	8.7	2.5	1.0
NexGen 3550RF	3.2	37.3	81.1	28.1	9.2	3.3	78.9	8.7	2.5	1.0
PhytoGen 125RF	3.5	36.5	82.8	29.2	9.3	4.3	78.3	8.0	2.8	1.0
Test average	3.4	37.9	81.9	29.3	8.5	3.5	78.5	8.4	2.5	1.0
CV, %	7.2	2.2	1.2	4.2	4.5	26.9	1.5	3.1	--	--
OSL	<0.0001	<0.0001	0.0083	<0.0001	<0.0001	0.0003	<0.0001	<0.0001	--	--
LSD	0.3	1.2	1.5	1.8	0.5	1.3	1.7	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.