

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

Cooperators: Moore County Gin and Texas AgriLife Research Field Lab at Etter

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Summary: The importance of variety selection is evident by the highest and lowest net values, a difference of \$298.12/acre. Significant differences were found among all varieties in most measured categories. Lint turnout ranged from a low of 22.7% for PhytoGen 125RF to a high of 28.7% for Deltapine121RF. Lint yields ranged from 721 lb/acre for PhytoGen 125RF to 1247 lb/acre for NexGen 1572RF. Lint loan values varied from \$0.5267/lb for AFD 5064RF to \$0.5788/lb for FiberMax 9068F. Total value/acre (lint plus seed value) ranged from \$482.38 for PhytoGen 125RF to \$813.21 for NexGen 1572RF. After subtracting seed, technology and ginning costs, the highest net values/acre among varieties were \$651.54 for NexGen 1572RF, \$511.95 for FiberMax 9058F, \$502.42 for NexGen 3410RF, \$501.29 for FiberMax 9068F, \$500.81 for FiberMax 9150F and \$487.68 for DeltaPine 121RF.

Objective: The objective of this test was to compare yield, gin turnout, fiber quality, and economics of transgenic varieties under irrigated conditions.

Materials and Methods:

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

Experimental design: Randomized complete block with 3 replications

Seeding rate: 4.0 seed per row-ft in 30-in row spacing (70,000 seed/acre)

Plot Size: 2 rows by 20 ft. planted straight on flat beds

Planting date: May 22, 2007

Weed management: Treflan at 1.5 pints/acre was applied preplant on May-09. On July-03 and August-15 applications of Roundup at 1 quart/acre were made.

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Rainfall and Irrigation:	Two irrigations (drip) of 1.5 inches were applied, one in late July and one in early August. Total rainfall for the growing season was 8.15 inches, for a total of 11.15 inches of water for the growing season.
Harvest:	Plots were hand harvested on November-30. Harvested material was weighed on a weigh scale to determine plot weights. Plot yields were converted to lb/acre.
Gin turnout:	Samples were collected 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 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 per acre was based on \$150/ton of seed. Ginning cost did not include checkoff.
Seed and technology cost:	Seed and technology cost were calculated using the appropriate seeding rate (seed/row-ft) for the 30-inch 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:

Of all the yield and quality factors measured only fiber uniformity and strength were not significantly different among varieties at $P=0.05$ (Tables 1 and 2). Lint turnout averaged 26.6% and ranged from 22.7% to 28.7%. Seed turnout varied from 35.3% to 40.7% and averaged 38.4%. Lint yield averaged 929 lb/acre and ranged from 1247 lb/acre for NexGen 1572RF to 721 lb/acre for PhytoGen 125RF. NexGen 1572RF also had the highest seed yield with 1907 lb/acre and Deltapine 110RF was the lowest with 1225 lbs/acre, with a test average of 1352 lb/acre. Lint loan value averaged \$0.5530/lb and ranged from \$0.5788/lb for FiberMax 9068F to \$0.5267/lb for AFD 5064F. Total value (lint value plus seed value) ranged from \$813.21/acre for NexGen 1572RF to \$482.38/acre for PhytoGen 125RF and averaged \$615.95/acre. Net value (total value minus ginning and seed/technology costs) averaged \$475.70 and varied from \$651.54 for NexGen 1572RF to \$353.42/acre for PhytoGen 125RF. The difference in net value for these two varieties was \$298.12/acre. The net values of five varieties, FiberMax 9058F at \$511.95/acre, NexGen 3410RF at \$502.42/acre, FiberMax 9068F at \$501.29/acre, FiberMax 9150F at \$500.81/acre and DeltaPine 121RF at \$487.68 were not statistically different from NexGen 1572RF.

Micronaire ranged from 4.0 for NexGen 1572RF to 4.9 with NexGen 1551RF with an average of 4.4. Staple length averaged 35.6 ranging from 34.1 to 36.8. Percent elongation varied from 6.9% for FiberMax 9150F to 9.7% for Deltapine 110RF. Uniformity ranged from 79.8% to 82.5% with an average of 80.8%. The lowest average leaf grade was 1.3 for FiberMax 9068F and the highest was 4.0 for NexGen 1572RF and Deltapine 110RF. Test averages for reflectance (Rd) and yellowness (+b) were 77.6 and 7.8 respectively. Color grades were mostly 31s to 32s.

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Table 1. Harvest results from the replicated irrigated cotton variety demonstration, Etter Farm, Etter, 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 -----			
NexGen 1572RF	27.0	40.7	4656	1247	1907	0.5333	670.16	143.05	813.21	114.07	47.61	651.54 a
FiberMax 9058F	26.7	35.3	3817	1005	1324	0.5635	563.69	99.30	662.98	93.52	57.52	511.95 ab
NexGen 3410RF	27.7	40.7	3328	922	1354	0.5748	529.99	101.57	631.56	81.54	47.61	502.42 ab
FiberMax 9068F	28.0	39.3	3331	941	1317	0.5788	544.79	98.77	643.56	81.60	60.67	501.29 ab
FiberMax 9150F	27.3	38.0	3479	947	1318	0.5752	544.73	98.84	643.57	85.24	57.52	500.81 ab
Deltapine 121RF	28.7	38.3	3345	956	1367	0.5587	533.47	102.51	635.98	81.94	66.36	487.68 ab
FiberMax 9060F	26.7	35.3	3567	945	1265	0.5475	517.83	94.91	612.74	87.40	57.52	467.82 b
NexGen 1551RF	25.3	37.7	3535	890	1338	0.5568	495.89	100.34	596.23	86.61	47.61	462.00 b
Deltapine 110RF	27.0	36.3	3363	905	1225	0.5323	481.91	91.88	573.79	82.38	60.00	431.41 b
NexGen 3550RF	25.7	40.0	3197	827	1284	0.5543	458.44	96.27	554.72	78.33	47.61	428.77 b
AFD 5064F	26.3	40.0	3199	845	1277	0.5267	444.87	95.76	540.63	78.36	53.03	409.24 b
PhytoGen 125RF	22.7	39.7	3151	721	1252	0.5345	388.48	93.90	482.38	77.20	51.76	353.42 b
Test average	26.6	38.4	3497	929	1352	0.5530	514.52	101.42	615.95	85.68	54.57	475.70
CV, %	11.7	4.1	11.7	11.6	13.5	3.2	12.4	13.5	12.4	11.7	--	14.2
OSL	0.0028	0.0012	0.0128	0.0028	0.0157	0.0102	0.0049	0.0157	0.0073	0.0128	--	0.0063
LSD	1.6	2.7	690	183	309	0.0301	108.34	23.18	129.78	16.90	--	114.58

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 replicated irrigated cotton variety demonstration, Etter Farm, Etter, TX, 2007.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32 ^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
NexGen 1572RF	4.0	35.2	81.1	27.2	8.6	4.0	77.9	7.3	3.7	1.0
FiberMax 9058F	4.3	36.8	79.8	28.9	7.1	2.3	77.6	7.6	3.3	1.3
NexGen 3410RF	4.1	36.2	81.0	27.1	8.0	2.3	77.2	8.4	3.0	1.7
FiberMax 9068F	4.5	36.8	81.3	30.3	7.8	1.3	80.0	7.7	3.0	1.0
FiberMax 9150F	4.2	36.4	80.0	29.4	6.9	2.3	79.5	7.5	3.0	1.3
FiberMax 9060F	4.4	36.6	80.0	28.4	7.3	3.0	78.1	7.5	3.7	1.0
NexGen 1551RF	4.9	34.6	81.3	31.7	8.1	1.7	77.0	8.7	3.0	2.0
Deltapine 121RF	4.7	34.6	80.8	26.7	8.9	1.7	77.5	8.4	3.0	1.3
Deltapine 110RF	4.5	36.2	80.7	30.3	9.7	4.0	74.2	8.2	3.7	2.3
NexGen 3550RF	4.3	35.5	80.3	30.1	8.3	3.0	77.1	7.7	3.3	1.7
AFD 5064F	4.8	34.1	81.1	29.2	8.6	3.7	77.3	7.6	3.7	1.3
PhytoGen 125RF	4.3	34.6	82.5	31.7	8.7	3.7	77.8	7.3	3.7	1.3
Test average	4.4	35.6	80.8	29.3	8.2	2.8	77.6	7.8	3.3	1.4
CV, %	4.6	3.0	1.8	7.2	2.7	22.2	1.7	3.0	--	--
OSL	0.0004	0.0266	0.6427	0.0912	0.0001	0.0001	0.0075	0.0001	--	--
LSD	0.3	1.8	NS	NS	0.4	1.0	2.3	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. NS - not significant.