

## Irrigated Flex Cotton Variety Demonstration, Sunray, TX – 2007

Cooperator: Kerry Cartrite

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**Summary:** The importance of variety selection was clearly evident in this trial. Net value differed by as much as \$383/acre depending on the variety planted. Average lint yield was excellent at this location at 1,964 lb/acre. Lint yield varied from 1,754 lb/acre with NexGen 3550RF to 2,282 lb/acre for FiberMax 9060F. Loan values ranged from \$.4798/lb for NexGen 1572RF to \$.5798/lb for NexGen 1551RF. After removing seed/technology and ginning costs the highest net value/acre varieties were FiberMax 9060F (\$1,261), FiberMax 9058F (\$1,235), and FiberMax 9068F (\$1,159).

**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, PhytoGen 125RF, FiberMax 9058F, FiberMax 9060F, FiberMax 9068F, AFD 5064F, NexGen 3550RF

**Experimental design:** Randomized complete block with 3 replications

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

**Plot Size:** 8 rows by approximately 800 ft in length around a pivot sprinkler irrigation system

**Planting date:** May 7, 2007

**Weed management:** Prowl H2O @ 32 oz/acre was applied along with Roundup @ 22oz/acre on May-10. Over the top Roundup applications were made on June-15 (30 oz/acre) and August-01(22 oz/acre).

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- Rainfall and Irrigation:** 11 inches of rain fell during the growing season (May 1 through September 31). In addition, 10 inches of water was applied by center pivot irrigation.
- Insecticides:** Timek @ 3 lbs/acre was applied in-furrow at planting, and Orethene @ 4 oz/acre was applied on June-05.
- Fertilizer management:** 100 lbs/acre of 11-52-0 dry fertilizer was applied on February-25, also prior to planting an application of 220 lbs/acre of liquid 32-0-0 was made on April-20. An additional 110 lbs/acre of liquid 32-0-0 was applied through the pivot between July-20 and August-20.
- Plant growth regulators:** 16 oz/acre of Pix was applied on July-12, along with another application of 20 oz/acre on August-01.
- Harvest aids:** Bollbuster was applied on October-16 at 33 oz/acre.
- Harvest:** Plots were harvested on November-15 using a commercial John Deere 7460 stripper with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine plot weights. Plot yields were converted to lb/acre.
- Gin turnout:** Samples from each plot were 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 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:**

Although heat units were scarce early in the season, a warm August and September resulted in excellent cotton yields at this location. All of the yield and quality parameters measured between varieties were significant at  $P=0.1$ , and most were significant at  $P=0.05$ . (Tables 1 and 2). Average lint yield was excellent at this location at 1,964 lb/acre, and was achieved with 11 inches of rainfall and 10 inches of irrigation water. Soil moisture conditions were excellent at planting. Lint turnout averaged 28.4% with a range of 26.0% to 30.4%. Lint yield ranged from a low of 1,754 lb/acre with NexGen 3550RF to a high of 2,282 lb/acre with FiberMax 9060F. Lowest lint loan value was with NexGen 1572RF at 47.9 cents and the highest with NexGen 1551RF at 57.9 cents. Total value (lint value plus seed value) ranged from \$1,087/acre to a high of \$1,510/acre and was closely correlated with net value (total value minus ginning and seed/technology cost). Net value ranged from a low of \$878/acre with NexGen 3550RF to a high of \$1,261/acre with FiberMax 9060F. The difference in the net value for these two varieties was \$383/acre. The net value of two varieties, FiberMax 9058F at \$1,235/acre, and FiberMax 9068F at \$1,159/acre, were not statistically different from the top net valued variety in the trial, FiberMax 9060F (\$1,261).

Micronaire ranged from 2.9 with NexGen 1572RF and NexGen 3550RF to 3.8 with NexGen 1551RF. Average micronaire was 3.2. Staple averaged 37.8 with a low of 36.1 with PhytoGen 125RF and high of 39.6 with FiberMax 9068F. Uniformity ranged from 80.5% to 83.2% with an average of 81.7%. Test average for strength was 28.5 g/tex with a low of 26.4 g/tex with NexGen1572RF and a high of 30.6 g/tex with NexGen 1551RF. Percent elongation values varied from a low of 7.8% with FiberMax 9060F to a high of 9.4% with PhytoGen 125RF. The lowest leaf grade was 1.7 with FiberMax 9068F and highest at 4.3 with AFD 5064F. Test averages for reflectance (Rd) and yellowness (+b) were 79.8 and 7.8, respectively. Color grades were 21's to 31's.

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Table 1. Harvest results from the replicated irrigated cotton variety demonstration, Kerry Cartrite Farm, Sunray, 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 9060F  | 30.0          | 45.5         | 7633                | 2282       | 3467             | 0.5478          | 1250.75    | 259.99             | 1510.74             | 187.02       | 62.18                | 1261.54 a   |
| FiberMax 9058F  | 30.4          | 45.7         | 7487                | 2274       | 3422             | 0.5377          | 1224.42    | 256.66             | 1481.08             | 183.43       | 62.18                | 1235.46 a   |
| FiberMax 9068F  | 28.7          | 46.7         | 7139                | 2052       | 3330             | 0.5610          | 1150.54    | 249.76             | 1400.30             | 174.90       | 65.80                | 1159.60 ab  |
| Deltapine 121RF | 30.4          | 43.9         | 6498                | 1977       | 2852             | 0.5515          | 1090.48    | 213.92             | 1304.41             | 159.21       | 65.02                | 1080.17 bc  |
| NexGen 1551RF   | 28.1          | 52.3         | 6290                | 1767       | 3286             | 0.5798          | 1025.58    | 246.43             | 1272.01             | 154.10       | 50.80                | 1067.11 bc  |
| AFD 5064F       | 26.9          | 48.1         | 7133                | 1913       | 3432             | 0.5273          | 1008.62    | 257.40             | 1266.02             | 174.77       | 57.03                | 1034.23 bcd |
| PhytoGen 125RF  | 26.0          | 48.3         | 7031                | 1827       | 3393             | 0.5335          | 972.55     | 254.43             | 1226.99             | 172.27       | 55.57                | 999.16 cde  |
| NexGen 1572RF   | 27.7          | 48.4         | 6610                | 1829       | 3196             | 0.4798          | 878.15     | 239.71             | 1117.86             | 161.94       | 50.80                | 905.12 de   |
| NexGen 3550RF   | 27.1          | 46.3         | 6472                | 1754       | 2994             | 0.4920          | 863.05     | 224.52             | 1087.57             | 158.57       | 50.80                | 878.20 e    |
| Test average    | 28.4          | 47.2         | 6921                | 1964       | 3264             | 0.5345          | 1051.57    | 244.76             | 1296.33             | 169.58       | 57.80                | 1068.96     |
| CV, %           | 3.8           | 5.4          | 6.8                 | 5.8        | 7.4              | 3.3             | 7.0        | 7.4                | 6.5                 | 6.8          | --                   | 7.2         |
| OSL             | 0.0007        | 0.0449       | 0.0257              | <0.0001    | 0.0707           | <0.0001         | <0.0001    | 0.0708             | 0.0001              | 0.0258       | --                   | 0.0001      |
| LSD             | 1.9           | 4.4          | 809                 | 197        | 344 <sup>†</sup> | 0.0309          | 126.58     | 25.81 <sup>†</sup> | 145.25              | 19.83        | --                   | 132.64      |

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.

<sup>†</sup> LSD - least significant difference at the 0.10 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, Kerry Cartrite Farm, Sunray, TX, 2007

| Entry           | Micronaire | Staple                   | Uniformity | Strength | Elongation | Leaf   | Rd          | +b         | Color grade |         |
|-----------------|------------|--------------------------|------------|----------|------------|--------|-------------|------------|-------------|---------|
|                 | units      | 32 <sup>nds</sup> inches | %          | g/tex    | %          | grade  | reflectance | yellowness | color 1     | color 2 |
| AFD 5064F       | 3.3        | 37.2                     | 82.5       | 28.7     | 9.1        | 4.3    | 78.5        | 7.9        | 3.0         | 1.0     |
| NexGen 1551RF   | 3.8        | 37.0                     | 82.4       | 30.6     | 8.5        | 2.7    | 79.3        | 8.7        | 2.3         | 1.0     |
| Deltapine 121RF | 3.3        | 37.2                     | 82.7       | 27.9     | 9.3        | 3.0    | 79.0        | 8.6        | 2.7         | 1.0     |
| FiberMax 9058F  | 3.2        | 38.7                     | 80.5       | 28.1     | 7.9        | 2.3    | 80.7        | 7.5        | 2.7         | 1.0     |
| FiberMax 9060F  | 3.2        | 38.9                     | 80.8       | 28.5     | 7.8        | 2.3    | 82.4        | 7.4        | 2.0         | 1.0     |
| FiberMax 9068F  | 3.2        | 39.6                     | 82.1       | 30.1     | 8.3        | 1.7    | 81.7        | 7.8        | 2.0         | 1.0     |
| NexGen 1572RF   | 2.9        | 37.3                     | 80.5       | 26.4     | 9.0        | 4.3    | 79.4        | 7.1        | 3.0         | 1.0     |
| NexGen 3550RF   | 2.9        | 37.9                     | 80.5       | 28.0     | 8.9        | 4.0    | 78.4        | 7.9        | 3.0         | 1.0     |
| PhytoGen 125RF  | 3.4        | 36.1                     | 83.2       | 28.7     | 9.4        | 3.7    | 78.8        | 7.8        | 3.0         | 1.0     |
| Test average    | 3.2        | 37.8                     | 81.7       | 28.5     | 8.7        | 3.1    | 79.8        | 7.8        | 2.6         | 1.0     |
| CV, %           | 6.8        | 1.4                      | 1.2        | 4.5      | 3.8        | 21.4   | 1.3         | 2.9        | --          | --      |
| OSL             | 0.0066     | <0.0001                  | 0.0096     | 0.0428   | <0.0001    | 0.0009 | 0.0009      | <0.0001    | --          | --      |
| LSD             | 0.4        | 0.9                      | 1.6        | 2.2      | 0.6        | 1.2    | 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.