



## Replicated Irrigated Transgenic Cotton Variety Demonstration, Dumas, TX - 2006

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**Summary:** Significant differences were observed for most parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 25.9% for PhytoGen 125RF to a high of 29.0% for Paymaster 2140B2RF and FiberMax 9058F. Lint yields varied with a low of 1316 lb/acre (Phytogen 125RF) and a high of 1553 lb/acre (Deltapine X04V344F). No significant differences were observed among varieties for lint loan value, total value, or net value (\$/acre). Lint loan values ranged from a low of \$0.4787/lb (FiberMax 9058F) to a high of \$0.5148/lb (AFD 5064F). After adding lint and seed value, total value/acre ranged from a low of \$820.43 for PhytoGen 125RF to a high of \$971.51 for Deltapine X04V344F. When subtracting ginning and seed/technology costs, the net value/acre ranged from a high of \$780.49 (Deltapine X04V344F) to a low of \$643.01 (PhytoGen 125F), a difference of \$137.48. Significant differences were observed among varieties for staple length, uniformity, strength, elongation, reflectance (Rd) and yellowness (+b). These data indicate that substantial differences can be obtained in yield and fiber quality due to variety and technology selection but may not be reflected in overall net value.

**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:** FiberMax 9058F, PhytoGen 125RF, Deltapine X04V344F, AFD 5064F, Stoneville NexGen 3550RF, and Paymaster 2140B2RF.

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

**Seeding rate:** 4.0 seed per row-ft in 30-inch row spacing (John Deere 7200 Max Emerge)

**Plot size:** 6 rows by variable length of circular pivot (732 to 938 ft long)

Planting date: 16-May

Weed management: Diuron plus Caparol herbicides were applied preemergence broadcast at 1/2X rates. Roundup Original Max was applied over-the-top on 1-July at a rate of 20 oz/acre with ammonium sulfate (17 lbs/100 gallons of spray mix).

Rainfall and Irrigation: A total of 7.31 inches of rainfall accumulated at this location during the growing season. This was in addition to 10.25 inches of irrigation for a total of 17.46 inches of moisture.

Insecticides: Temik was applied in-furrow at planting at 3.6 lbs/acre. No other insecticides were used at this site during the growing season.

Fertilizer management: 37.5 lb N, 28.5 lb P<sub>2</sub>O<sub>5</sub> and 14.3 lb K<sub>2</sub>O/acre were applied in a strip (strip tillage) prior to planting and 60 lb N were applied in increments during the growing season via fertigation.

Plant growth regulators: A total of 32 oz/acre of Pix was applied during the growing season at this site.

Harvest aids: Finish 6 Pro at 32 oz/acre was applied on 10-October.

Harvest: Plots were harvested on 13-November using a commercial John Deere 7460 with field cleaner. Harvested material was transferred into a weigh wagon with integral electronic scales to determine individual plot weights. Plot yields were adjusted to lb/acre.

Gin turnout: Grab samples were taken by plot and ginned at the Texas A&M University Agricultural 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/acre was based on \$125/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:**

Significant differences were observed for most parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 25.9% for PhytoGen 125RF to a high of 29.0% for Paymaster 2140B2RF and FiberMax 9058F. Lint yields varied with a low of 1316 lb/acre (PhytoGen 125RF) and a high of 1553 lb/acre (Deltapine X04V344F). No significant differences were observed among varieties for lint loan value, total value, or net value (\$/acre). Lint loan values ranged from a low of \$0.4787/lb (FiberMax 9058F) to a high of \$0.5148/lb (AFD 5064F). After adding lint and seed value, total value/acre ranged from a low of \$820.43 for PhytoGen 125RF to a high of \$971.51 for Deltapine X04V344F. When subtracting ginning and seed/technology costs, the net value/acre ranged from a high of \$780.49 (Deltapine X04V344F) to a low of \$643.01 (PhytoGen 125RF), a difference of \$137.48. Although numerically different, all varieties resulted in statistically similar net values. No differences were observed among varieties for micronaire or leaf grade at this location. A test average 3.0, was observed for micronaire, and 4.1, was observed for leaf. Staple length averaged 37.0 across all varieties with a low of 36.1 for PhytoGen 125RF and a high of 38.6 for FiberMax 9058F. Uniformity was highest for PhytoGen 125RF (83.2%) and lowest for FiberMax 9058F (80.4%). A test average strength of 27.8 g/tex was observed with a high of 29.6 g/tex (PhytoGen 125RF) and a low of 26.0 g/tex (Deltapine X04V344F). Percent elongation ranged from a high of 7.1, for AFD 5064F and PhytoGen 125RF, to a low of 5.9 for FiberMax 9058F. Test averages for reflectance (Rd) and yellowness (+b) were 81.2 and 7.2, respectively. Color grades were mostly 31's, with a few 21's at this location. These data indicate that substantial differences can be obtained in yield and fiber quality due to variety and technology selection but may not be reflected in overall net value. It should be noted that no inclement weather was encountered at this location prior to harvest. 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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## **Disclaimer Clause:**

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Table 1. Harvest results from the irrigated replicated transgenic cotton variety demonstration, Keith Watson Farm, Dumas, TX, 2006.

| 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    | lb/acre    | \$/lb           | \$/acre    | \$/acre    | \$/acre     | \$/acre      | \$/acre              | \$/acre   |
| Deltapine X04V344F       | 27.2         | 53.3             | 5708             | 1553       | 3040       | 0.5032          | 781.52     | 190.00     | 971.51      | 139.84       | 51.19                | 780.49 a  |
| AFD 5064F                | 27.7         | 53.6             | 5025             | 1390       | 2693       | 0.5148          | 714.29     | 168.32     | 882.61      | 123.10       | 47.50                | 712.02 a  |
| Stoneville NexGen 3550RF | 28.5         | 54.0             | 4756             | 1354       | 2566       | 0.5000          | 680.58     | 160.39     | 840.97      | 116.52       | 47.00                | 677.46 a  |
| Paymaster 2140B2RF       | 29.0         | 52.0             | 4844             | 1403       | 2521       | 0.4907          | 688.31     | 157.52     | 845.83      | 118.68       | 60.19                | 666.97 a  |
| FiberMax 9058F           | 29.0         | 51.3             | 4864             | 1412       | 2493       | 0.4787          | 675.00     | 155.82     | 830.82      | 119.16       | 49.97                | 661.69 a  |
| PhytoGen 125RF           | 25.9         | 53.1             | 5075             | 1316       | 2696       | 0.4958          | 651.91     | 168.52     | 820.43      | 124.34       | 53.09                | 643.01 a  |
| Test average             | 27.9         | 52.9             | 5045             | 1405       | 2668       | 0.4972          | 698.60     | 166.76     | 865.36      | 123.61       | 51.49                | 690.27    |
| CV, %                    | 3.7          | 2.0              | 4.3              | 4.3        | 4.4        | 6.4             | 8.9        | 4.4        | 7.8         | 4.3          | ---                  | 9.2       |
| OSL                      | 0.0298       | 0.0849           | 0.0036           | 0.0124     | 0.0020     | 0.8148          | 0.2479     | 0.0020     | 0.1561      | 0.0036       | ---                  | 0.1955    |
| LSD                      | 1.9          | 1.6 <sup>†</sup> | 397              | 111        | 214        | NS              | NS         | 13.35      | NS          | 9.71         | ---                  | NS        |

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> denotes LSD at the 0.10 level, NS - nonsignificant.

Note: some columns may not add up due to rounding error.

Assumes:

\$2.45/cwt ginning cost.

\$125/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 irrigated replicated transgenic cotton variety demonstration, Keith Watson Farm, Dumas, TX, 2006.

| 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 |
| Deltapine X04V344F       | 3.1        | 36.4                     | 80.5       | 26.0     | 6.2        | 3.7    | 81.4        | 7.6        | 2.7         | 1.0     |
| AFD 5064F                | 3.2        | 36.6                     | 82.4       | 29.2     | 7.1        | 4.0    | 81.0        | 7.2        | 3.0         | 1.0     |
| Stoneville NexGen 3550RF | 3.1        | 36.7                     | 82.5       | 27.8     | 6.8        | 5.0    | 80.1        | 6.5        | 3.0         | 1.0     |
| Paymaster 2140B2RF       | 3.1        | 37.5                     | 81.5       | 27.9     | 7.0        | 4.0    | 81.1        | 7.2        | 3.0         | 1.0     |
| FiberMax 9058F           | 2.7        | 38.6                     | 80.4       | 26.5     | 5.9        | 3.7    | 82.5        | 7.2        | 2.0         | 1.0     |
| PhytoGen 125RF           | 2.9        | 36.1                     | 83.2       | 29.6     | 7.1        | 4.0    | 81.1        | 7.2        | 3.0         | 1.0     |
| Test average             | 3.0        | 37.0                     | 81.8       | 27.8     | 6.7        | 4.1    | 81.2        | 7.2        | 2.8         | 1.0     |
| CV, %                    | 8.5        | 1.0                      | 0.8        | 3.6      | 4.4        | 14.0   | 0.9         | 4.0        | --          | --      |
| OSL                      | 0.3024     | <0.0001                  | 0.0027     | 0.0076   | 0.0021     | 0.1299 | 0.0320      | 0.0146     | --          | --      |
| LSD                      | NS         | 0.6                      | 1.3        | 1.8      | 0.5        | NS     | 1.3         | 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, NS - nonsignificant.