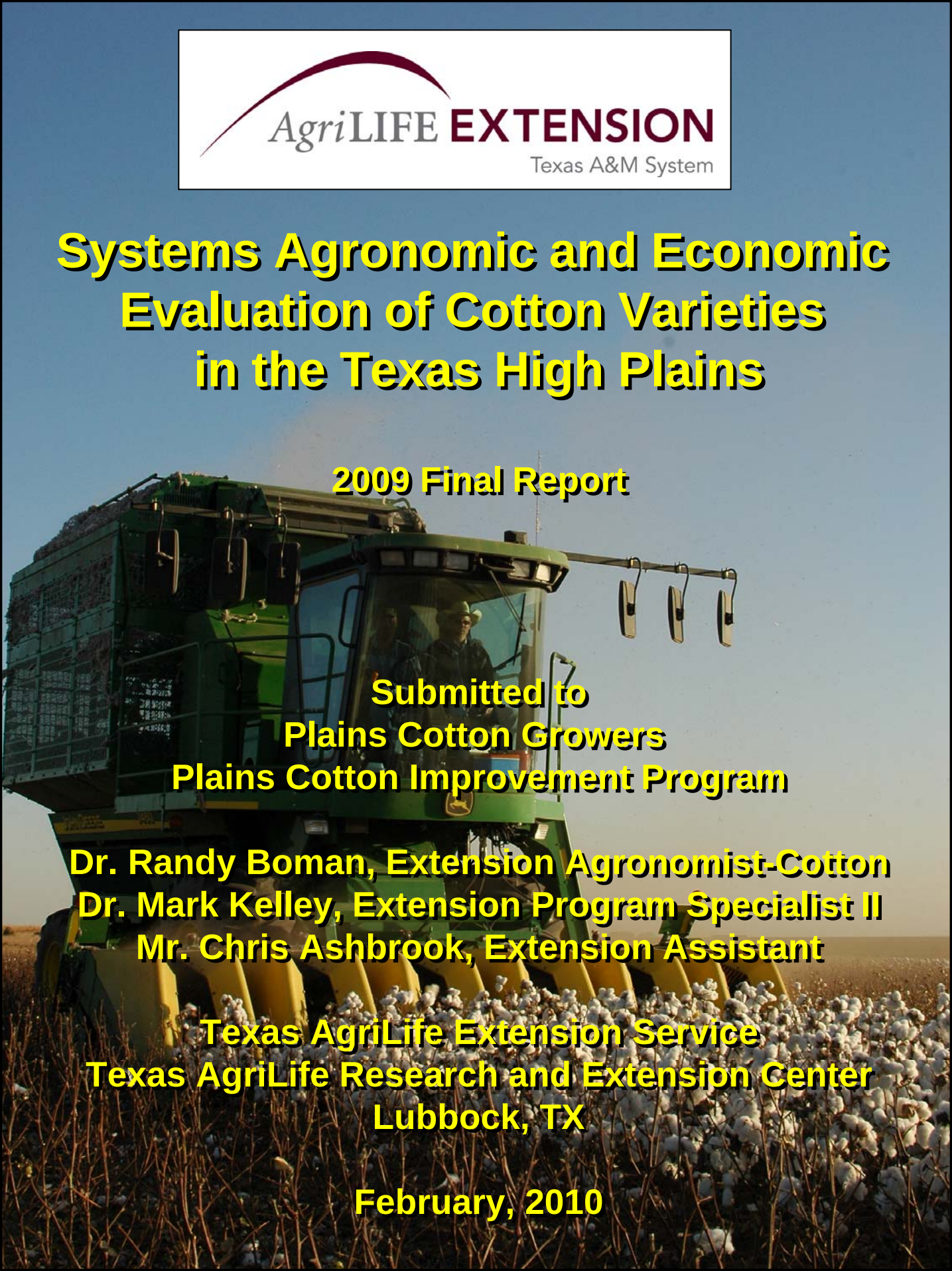

AgriLIFE EXTENSION
Texas A&M System

Systems Agronomic and Economic Evaluation of Cotton Varieties in the Texas High Plains

2009 Final Report

Submitted to
Plains Cotton Growers
Plains Cotton Improvement Program

Dr. Randy Boman, Extension Agronomist-Cotton
Dr. Mark Kelley, Extension Program Specialist II
Mr. Chris Ashbrook, Extension Assistant

Texas AgriLife Extension Service
Texas AgriLife Research and Extension Center
Lubbock, TX

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February, 2010

Dr. Randy Boman, Extension Agronomist - Cotton
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Texas AgriLife Extension Service
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Characteristics commonly evaluated in small-plot testing include lint yield, turnout percentages, fiber quality, and earliness. Current small-plot variety testing programs are inadequate in scale and design to investigate the economic impact of new transgenic varieties with value-added traits. The objective of this project was to evaluate the profitability of cotton varieties and to a lesser degree harvesting methods in producers' fields in the Texas High Plains. Three replications of each variety were included at each location. Plot size was of sufficient size to enable the combining of all replications of each individual variety into a single module at harvest. Each individual variety had at least three acres total (approximately one acre per plot with three replications equals three acres total). Plot weights were determined at harvest using a boll buggy with integral electronic scales. Modules were followed through the ginning process to determine lint turnout, USDA-AMS fiber quality, and CCC loan value.

In 2009, a year characterized by early season drought with somewhat above average total heat unit accumulation (with above normal August, but below normal September and October heat units), yields were typically good at most locations. However, fiber quality was negatively impacted by the cool finish, and was below expectations in terms of staple, micronaire and bark contamination at some sites. Verticillium wilt pressure continues to build in the region. A total of three locations were included for stripper harvested comparisons in 2009. The Muleshoe site was destroyed by hail on June 4. Significant Verticillium wilt disease pressure was noted at Plains, and some at Blanco. The Plains site net value per acre ranged from a low of $266.03 for All-Tex Epic RF to a high of $604.66 for Deltapine 0924B2RF, a difference of $338.63. A total of 8 varieties were in the statistical upper tier at this location. The Blanco site test average net value/acre was $624.11 and ranged from a high of $696.58 for FiberMax 1740B2F to a low of $568.06 for Deltapine 0924B2RF, a difference of $128.52. At Blanco, four varieties were included in the statistical upper tier in terms of net value per acre. Results from the 2009 production season at varying locations in the Texas High Plains indicate that, in a year when early stand establishment was difficult, and a cool finish was encountered, yield and fiber quality were adversely affected at some sites. These data indicate that substantial differences can be observed in terms of net value/acre due to variety and technology selection. The differences in net value/acre, when comparing the top and bottom varieties were approximately $338 at Plains and $128 at Blanco. Additional multi-site and multi-year applied research is needed to evaluate varieties and harvester performance across a series of environments.

Agronomic and Economic Evaluation of Cotton Varieties

February, 2010

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Introduction

Small-plot cotton variety testing generally includes evaluation of genetic components but not genetics in concert with management programs. Characteristics commonly evaluated in small-plot testing include lint yield, turnout percentages, fiber quality, and earliness. Over the last several years, High Plains cotton producers have increased planted acres of transgenic cottons (glyphosate- and glufosinate-herbicide tolerant and Bt insect-resistant types) from approximately 300 thousand in 1997 to approximately 2.8 million in 2009. Transgenic varieties are now planted on approximately 85% of the total High Plains planted acreage. Industry continues to increase the number of herbicide-tolerant, insect-resistant, and "stacked gene" varieties. The proliferation of transgenic varieties in the marketplace is expected to continue over the next several years. New transgenic varieties continue to be marketed in the High Plains by All-Tex, Americot/NexGen, Croplan Genetics, Delta and Pine Land/Monsanto, Dyna-Gro, the Bayer CropScience FiberMax/Stoneville brands, and the Dow AgroSciences PhytoGen brand.

More transgenic varieties of both picker and stripper type cottons are expected to be released by these companies in the future. Liberty Link Ignite herbicide-tolerant varieties (from Bayer CropScience) were first marketed in 2004. The first commercial "stacked Bt gene" system (Bollgard II from Monsanto) was launched in 2004. Varieties containing Monsanto's Roundup Ready Flex gene system were increased in 2005, with commercialization in 2006. Many Roundup Ready Flex only types as well as those "stacked" with Bollgard II were available. Widestrike "stacked Bt gene" technology from Dow AgroSciences was available in some PhytoGen varieties in 2005, with additional Roundup Ready Flex "stacked" types in the market in 2006. Liberty Link with Bollgard II types were also commercialized in 2006. Additional cotton biotechnologies are also anticipated in the near future including the GlyTol glyphosate tolerance trait as well as GlyTol stacked with Liberty Link from Bayer CropScience.

Current small-plot variety testing programs are inadequate in scale and design to investigate the economic impact of new transgenic varieties with value-added traits. The objective of this project was to evaluate the profitability of cotton varieties in producers' fields in the Texas High Plains.

Materials and Methods

For scientific validity, three replications of each variety were included at the Muleshoe and Plains locations, with four replications included at Blanco (harvested 3 replications). Plots were of sufficient size to enable the combining of all replications of each individual variety into a single module at harvest. Each individual variety had at least three acres total (approximately one acre per plot with three replications equals three acres total). A randomized complete block design was used at all locations. Unfortunately, the Muleshoe location was hailed out on June 4. Preplant incorporated and/or preemergence herbicide applications were made at the discretion of the producer-cooperator. At all sites, varieties were either Roundup Ready Flex, or Roundup Ready Flex stacked with Bollgard II or Widestrike; therefore, no differential herbicide applications were made. Herbicide, insecticide and plant growth regulator applications were made by the

cooperator when and if needed. Weed species spectrum was determined by project personnel working with the cooperator. Harvest aids were applied by the cooperator as needed at remaining locations.

Nodes above white flower (NAWF) data were derived from 10 representative plants/plot for a total of 30 plants/variety (40 plants at Blanco). Plot weights were determined at harvest using a boll buggy with integral electronic scales. Variety specific modules were followed through the commercial ginning process and lint and seed turnouts were recorded to determine lint and seed yields. HVI classing data was obtained for each bale classed and averaged by variety. 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 available at: http://www.plainscotton.org/Seed/seedindex.html. Data were then converted to a per acre basis and appropriate statistical analyses were performed.

Location 1 – Muleshoe (Parmer County)

James Brown Farm, near Muleshoe (Parmer County)
Strip tillage in terminated wheat
Irrigation: Low elevation spray, straight rows
Plot size: 12 30-inch rows
Area: Variable (1.2 to 1.8 acres/plot), 3 replications of each variety
Planted: May 12 at 4.3 seed/per row-ft or ~75,600 seed/acre.
Site hailed out on June 4.

Varieties planted at this site included:

1. All-Tex Epic RF
2. Croplan Genetics 3035RF
3. NexGen 3348B2RF
4. FiberMax 1740B2F
5. FiberMax 9160B2F
6. FiberMax 9180B2F
7. NexGen 2549B2RF
8. Deltapine 0912B2RF
9. Dyna-Gro 2570B2RF
10. PhytoGen 375WRF

Location 2 – Plains (Yoakum County)

Rickey Bearden Farm, Plains (Yoakum County)
Clean-tillage following Roundup Ready soybeans
Irrigation: Low elevation spray, straight rows
Plot Size: 12 40-inch rows/plot (24 40-inch rows for varieties common with Acuff for picker vs. stripper comparisons)
Area: Variable (0.9 to 1.2 acres/plot), 3 replications of each variety and variety/harvest method
Planted: May 18 at 4 seed/per row-ft, or 52,272 seed/acre
Partially defoliated by high wind/blowing sand/hail event on July 17.

Varieties planted at this site included:

1. All-Tex Epic RF
2. Americot 1532B2RF*
3. NexGen 2549B2RF
4. NexGen 3348B2RF
5. FiberMax 1740B2F

6. FiberMax 9160B2F*
7. FiberMax 9170B2F*
8. FiberMax 9180B2F*
9. Stoneville 4288B2F
10. Stoneville 4498B2RF
11. Stoneville 5458B2RF
12. Croplan Genetics 3220B2RF
13. Deltapine 0912B2RF
14. Deltapine 0924B2RF
15. Dyna-Gro 2570B2RF
16. PhytoGen 375WRF

*denotes varieties common with Acuff location for picker/stripper comparison.

Ginning: Performed by NewTex Gin, Plains, TX.

Harvesters: Stripper John Deere 7460 with field cleaner

Weed Control Program: $29.91/acre

Dominant weed species: pigweed, silverleaf nightshade, golden crownbeard, and kochia

Blanket herbicide applications were made by the producer via ground rig at this location. A preplant incorporated application of 1.0 pt/acre trifluralin was made. An application of 4.0 oz/acre trifluralin and 0.5 oz/acre Staple was applied to a 10" band behind the presswheel at planting. An additional application of 32.0 oz/acre Roundup PowerMax with AMS was made on July 1.

Three cultivations were conducted during the early part of the growing season for wind erosion control. Also, a single cultivation was conducted on July 15 for control of weed escapes.

Insect Control Program: $15.25/acre

Temik was applied infurrow at planting at a rate of 5 lbs/acre. This location was in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Foundation.

PGR Program: $0.00/acre

No PGR applications were made at this site in 2009.

Harvest Aid Program: $41.25/acre

Harvest aids applied by the producer included, October 8, 1.0 qt/acre Finish 6 Pro with 7 oz/acre Ginstar EC followed by a sequential application of 16.0 oz/acre Gramoxone Inteon with 3.2 oz/acre non-ionic surfactant (NIS) on October 19.

Total input cost for this location was $86.41/acre and include all herbicide and insecticide costs and application costs, when applicable (Table 4). This cost is not reflected in the net value/acre means in Table 2.

Location 3 – Blanco (Crosby County)

Appling Farm, near Blanco (Crosby County)
Clean tillage following cotton

Irrigation: LEPA, circular rows
Plot Size: 8 40-inch rows/plot
Area: Variable (1.1 to 2.3 acres/plot), 3 replications harvested of each variety (planted 4 replications)
Planted: May 14 at 3.1 seed/per row-ft, or ~40,000 seed/acre
Harvested: November 5 and 6, 2009

Varieties planted at this site included:

1. All-Tex Epic RF
2. NexGen 2549B2RF
3. NexGen 3348B2RF
4. FiberMax 1740B2F
5. FiberMax 9160B2F
6. FiberMax 9180B2F
7. Stoneville 4288B2F
8. Croplan Genetics 3220B2RF
9. Deltapine 0924B2RF
10. Deltapine 0935B2RF
11. Dyna-Gro 2570B2RF
12. PhytoGen 375WRF
13. NexGen 3410RF
14. FiberMax 9058F

Ginning: Performed by Associated Cotton Growers Gin, Crosbyton, TX.

Harvester: John Deere 7455 stripper with field cleaner

Weed Control Program: $58.75/acre

Dominant weed species: pigweed, silverleaf nightshade, horseweed, kochia, lanceleaf sage, and volunteer Roundup Ready Flex cotton

Blanket herbicide applications were made by the producer via ground rig at this location. A preplant incorporated application of 1.0 qt/acre trifluralin was made. An application of 22.0 oz/acre Roundup PowerMax (glyphosate) with AMS was made on June 16 at 10 gal/acre spray volume (included Orthene for thrips control). Additional applications of 22.0 oz/acre Roundup PowerMax with AMS were made on July 15 and August 26 at 5 gal/acre spray volume.

A single cultivation was conducted on July 14 for control of volunteer Roundup Ready Flex cotton. No hoeing was conducted at this site for weed control.

Insect Control Program: $1.21/acre

Acephate was applied at 3.0 oz/acre with the June 16 application of Roundup PowerMax for thrips control. This location was in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Foundation.

PGR Program: $0.00/acre

No PGR applications were made at this site in 2009.

Harvest Aid Program: $29.87/acre

Harvest aids applied by the producer on October 8 included 32.0 oz/acre Finish 6 Pro and 6.0 oz/acre Ginstar EC. No sequential application was required.

Total input cost for this location was $83.81/acre and include all herbicide and insecticide costs and application costs, when applicable (Table 8). This cost is not reflected in the net value/acre means in Table 8.

Results

Agronomic and economic results by variety as well as summaries of expenses incurred at Plains, Blanco and Acuff are included in Tables 1 - 14.

Location 1 - Muleshoe

This site was destroyed by hail on June 4, 2009.

Location 2 – Plains

At this location, it should be noted that the picker harvested plot data was not included in the analysis for the following results but will be discussed later in the report. Plant population and NAWF data are presented in Table 1. Plant stands averaged 44,812 plants/acre on June 17. Significant differences were observed among varieties for plant stand with a range from a high of 49,832 for Deltapine 0912B2RF to a low of 39,814 for Americot 1532B2RF. NAWF counts were conducted on July 30, August 6, August 13, August 18, August 26, and August 31. Differences were observed for counts taken on August 6, August 18, and August 31, only. The test average on July 30 was 7.6 NAWF. On August 6, the test average was 7.0 with a high of 7.7 for All-Tex Epic RF, and a low of 6.5 for FiberMax 9170B2F and NexGen 3348B2RF. Average NAWF decreased to 6.5 on August 13. All-Tex Epic RF again had the highest NAWF on August 18 with 7.1 and FiberMax 9170B2F had the lowest with 5.6, and a test average of 6.2 was observed. By August 26 two varieties, FM 9160B2F (4.8, the lowest) and Stoneville 4498 B2RF (5.0), had reached cutout (NAWF=5) and the test average was 5.3. All-Tex Epic RF continued to have the highest on August 26 with 5.9 NAWF. By the final observation date (August 31), all varieties had reached cutout with a test average of 4.1. The lowest (3.6) was observed for FiberMax 1740B2F, FiberMax 9160B2F, and NexGen 3348B2RF, and the highest (4.7) was again observed for All-Tex Epic RF.

This site struggled during early stand establishment and was partially defoliated by a high wind/blowing sand/hail event on July 17. Significant Verticillium wilt pressure was eventually observed at this location which may have reduced yield and quality for some less tolerant varieties. At harvest, one of the variety modules (Croplan Genetics 3220B2RF) caught fire and was destroyed. As a result of this, the grab samples were ginned to determine lint and seed percents and the lint samples were submitted to the Fiber and Biopolymer Research Institute (FBRI) at Texas Tech University for HVI analysis. Furthermore, CCC loan values were determined from the HVI data from FBRI. It should be noted that bark contamination is not determined by the FBRI.

Turnouts of field-cleaned bur cotton averaged 26.6% with a high of 30.4% for PhytoGen 375WRF and a low of 22.4% for All-Tex Epic RF (Table 2). Bur cotton yields ranged from 4990 lb/acre for NexGen 2549B2RF to 3422 lb/acre for All-Tex Epic RF. Lint yields ranged from 1364 lb/acre for Deltapine 0924B2RF to 766 lb/acre for All-Tex Epic RF with a test average of 1183 lb/acre. Lint loan values derived from commercial bales for all varieties excluding Croplan Genetic 3220B2RF (determined from Texas Tech University FBRI HVI data) indicated that values ranged from $0.5184 for FiberMax 9180B2F to $0.4148 for All-Tex Epic RF. After totaling lint and seed value per acre and subtracting out ginning costs and seed and technology costs, the net value per acre ranged

from a low of $266.03 for All-Tex Epic RF to a high of $604.66 for Deltapine 0924B2RF, a difference of $338.63. A total of 8 varieties were in the statistical upper tier at this location.

Fiber data from commercial bales were averaged by variety (with exception of Croplan Genetics 3220 B2RF, see above) and reported in Table 3. Micronaire averages ranged from 3.1 for Deltapine 0912 B2RF to 2.5 for All-Tex Epic RF and Croplan Genetics 3220B2RF. Average staple was highest for FiberMax 9170B2F (36.1) and lowest for NexGen 2549B2RF (33.1). The highest average uniformity (80.4%) was observed in NexGen 3348B2RF and PhytoGen 375WRF had the lowest with 77.8%. Average fiber strength values ranged from a high of 28.9 g/tex for FiberMax 9180B2F and NexGen 3348B2RF to a low of 26.0 for Americot 1532B2RF. Color grades were predominately 11 and 21 with some 31. Reflectance (Rd) ranged from 84.5 (Croplan Genetics 3220B2RF) to 78.7 (Stoneville 5458B2F). The highest yellowness or +b value was observed for All-Tex Epic RF at 9.2 and the lowest of 7.0 for FiberMax 9180B2F.

Location 3 – Blanco

This site was moved from the location used in previous years to a larger center pivot and four replications were planted to insure adequate harvested material for moduling by variety. However, it was determined at harvest that three replications would be sufficient. The stand count and NAWF data are presented in Table 5. Plant populations averaged 33,193 plants/acre on June 12. No significant differences were observed among varieties for plant stand with a range from a high of 35,349 for FiberMax 9180B2F and NexGen 3348B2RF to a low of 28,227 for Deltapine 0924B2RF. Significant differences were observed among varieties for NAWF for all observation dates. The test average on July 27 was 6.2 NAWF with a high of 6.9 for Deltapine 0935B2RF and a low of 5.5 for FiberMax 9058F. On August 3, the test average was 5.9 and ranged from a high of 6.7 for Deltapine 0935B2RF to a low of 5.3 for FiberMax 9058F. By August 10 six varieties had reached cutout. Deltapine 0935B2RF had the highest NAWF with 5.7 while a low of 4.4 was observed for NexGen 3410RF and FiberMax 9058F and the test average was 5.1. All varieties had reached cutout by the final observation date on August 17 with a test average of 3.9. The lowest (3.4) was observed for NexGen 3410RF, and the highest (4.8) was observed for Deltapine 0935B2RF.

Some Verticillium wilt pressure was observed at this location and may have resulted in decreased yield and quality for some of the less tolerant varieties. Turnouts of field-cleaned bur cotton averaged 33.5% and ranged from a high of 36.7% for FiberMax 1740B2F to a low of 30.5% for FiberMax 9058F (Table 6). Bur cotton yields averaged 3498 and ranged from 3640 lb/acre for Dyna-Gro 2570B2RF to 3315 lb/acre for NexGen 3348 B2RF. Lint yields ranged from a high of 1303 lb/acre for FiberMax 1740B2F to a low of 1079 lb/acre for FiberMax 9058F with a test average of 1173 lb/acre. Average lint loan values derived from commercial bales indicated that Deltapine 0935B2RF had the highest with $0.5720/lb and Croplan Genetics 3220B2RF had the lowest with $0.5317/lb. After totaling lint and seed value per acre and subtracting out ginning costs and seed and technology costs, the test average net value per acre was $624.11 and ranged from a high of $696.58 for FiberMax 1740B2F to a low of $568.06 for Deltapine 0924B2RF, a difference of $128.52. At this location, four varieties were included in the statistical upper tier in terms of net value per acre.

Fiber data derived from commercially ginned bales were averaged by variety with results reported in Table 7. Stoneville 4288B2F had the highest average micronaire of 4.4 and All-Tex Epic RF had the lowest with 3.8. Average staple was highest for NexGen 3410RF (37.0) and lowest for Croplan Genetics 3220B2RF (33.6). The highest average uniformity (82.3%) was observed for NexGen 3348B2RF and Croplan Genetics 3220B2RF had the lowest with 80.0%. Fiber strength average values ranged from a high of 31.5 g/tex for NexGen 3410RF to a low of 28.0 g/tex for Croplan Genetics 3220B2RF. Color grades were mostly 11 and 21, with a few 31. Average reflectance (Rd) ranged from a high of 83.5 (FiberMax 9180B2F and Deltapine 0935B2RF) to a low of 79.7

(NexGen 3410RF). The highest +b (yellowness) value was observed for Croplan Genetics 3220B2RF (8.5) and the lowest for FiberMax 9180B2F (6.9).

Summary and Conclusions

In 2009 (a year characterized by early season drought, somewhat above average total heat unit accumulation, with above normal August, but below normal September and October heat units) yields were typically good at most locations. However, fiber quality was negatively impacted by the cool finish, and was below expectations in terms of staple, micronaire and bark contamination at some sites. Verticillium wilt pressure continues to build in the region. A total of three locations were established for stripper harvesting in 2009. Muleshoe, Blanco were designated for stripper harvesting comparisons. Picker and stripper harvesting comparisons were obtained at Plains, Acuff, and Ralls (see below). The Muleshoe site was destroyed by hail on June 4, 2009.

The Plains site struggled during early stand establishment and was partially defoliated by a high wind/blowing sand/hail event on July 17. **Significant Verticillium wilt pressure was eventually observed at this location which may have reduced yield and quality for some less tolerant varieties.** Turnouts of field-cleaned bur cotton averaged 26.6% with a high of 30.4% for PhytoGen 375WRF and a low of 22.4% for All-Tex Epic RF. Lint yields ranged from 1364 lb/acre for Deltapine 0924B2RF to 766 lb/acre for All-Tex Epic RF with a test average of 1183 lb/acre. Net value per acre ranged from a low of $266.03 for All-Tex Epic RF to a high of $604.66 for Deltapine 0924B2RF, a difference of $338.63. A total of 8 varieties were in the statistical upper tier at this location.

Some verticillium wilt pressure was observed at the Blanco location and may have resulted in decreased yield and quality for some of the less tolerant varieties. Turnouts of field-cleaned bur cotton averaged 33.5% and ranged from a high of 36.7% for FiberMax 1740B2F to a low of 30.5% for FiberMax 9058F. Lint yields ranged from a high of 1303 lb/acre for FiberMax 1740B2F to a low of 1079 lb/acre for FiberMax 9058F with a test average of 1173 lb/acre. The test average net value per acre was $624.11 and ranged from a high of $696.58 for FiberMax 1740B2F to a low of $568.06 for Deltapine 0924B2RF, a difference of $128.52. At this location, four varieties were included in the statistical upper tier in terms of net value per acre.

Results from the 2009 production season at varying locations in the Texas High Plains indicate that, in a year when early stand establishment was difficult, and a cool finish was encountered, yield and fiber quality were adversely affected at some sites. These data indicate that substantial differences can be observed in terms of net value/acre due to variety and technology selection. The differences in net value/acre, when comparing the top and bottom varieties were approximately $338 at Plains and $128 at Blanco. Additional multi-site and multi-year applied research is needed to evaluate varieties and harvester performance across a series of environments.

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Table 1. Stand count and NAWF results from the irrigated large plot replicated systems variety trial, Rickey Bearden Farm, Plains, TX, 2009.

	Plant Population		Nodes Above White Flower (NAWF) for Week of					
Variety	no/row ft	no/acre	30-Jul	6-Aug	13-Aug	18-Aug	26-Aug	31-Aug
Americot 1532B2RF	3.1	39,814	7.6	6.6	6.4	6.2	5.2	3.9
All Tex Epic RF	3.2	42,602	7.3	7.7	6.8	7.1	5.9	4.7
Croplan Genetics 3220B2RF	3.6	46,783	8.0	7.0	6.6	6.4	5.1	4.6
Dyna-Gro 2570B2RF	3.1	40,772	8.0	7.4	6.6	6.7	5.6	3.9
Deltapine 0912B2RF	3.8	49,832	7.6	6.9	6.4	6.4	5.5	4.3
Deltapine 0924B2RF	3.6	47,219	7.7	7.1	6.5	6.3	5.3	4.1
FiberMax 1740B2F	3.5	46,087	7.7	7.4	5.9	6.2	5.5	3.6
FiberMax 9160B2F	3.1	41,121	7.3	7.0	6.3	5.7	4.8	3.6
FiberMax 9170B2F	3.3	43,211	7.6	6.5	5.9	5.6	5.3	4.3
FiberMax 9180B2F	3.2	42,166	7.4	6.6	6.5	5.9	5.2	4.0
NexGen 2549B2RF	3.6	46,522	7.6	7.1	6.2	6.3	5.2	3.7
NexGen 3348B2RF	3.4	44,605	7.2	6.5	6.6	5.9	5.2	3.6
PhytoGen 375WRF	3.7	47,829	8.0	7.1	6.6	6.3	5.5	3.9
Stoneville 4288B2F	3.4	44,083	7.6	6.9	6.4	6.2	5.4	4.6
Stoneville 4498B2RF	3.6	47,045	7.5	6.8	6.8	6.0	5.0	4.5
Stoneville 5458B2RF	3.6	47,306	7.4	7.1	6.9	6.6	5.5	4.3
Test avg	3.4	44,812	7.6	7.0	6.5	6.2	5.3	4.1
CV, %	6.1	5.9	8.5	6.5	7.4	6.5	10.4	12.6
OSL	0.0011	0.0011	0.9558	0.0830†	0.4144	0.0097	0.7239	0.0979†
LSD 0.05	0.3	4,406	NS	0.6	NS	0.7	NS	0.7

NAWF numbers represent an average of 10 plants per rep per variety for a total of 30 plants per variety.
CV - coefficient of variation, percent.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level, †denotes significance at the 0.10 level, NS - not significant.

Table 2. Harvest results from the irrigated large plot replicated systems variety trial, Rickey Bearden Farm, Plains, TX, 2009.

Variety	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 ----------						
Deltapine 0924B2RF	30.3	49.1	4498	1364	2206	0.4634	632.07	176.50	808.57	134.95	68.96	604.66	a
FiberMax 9170B2F	28.0	46.5	4597	1288	2139	0.4821	620.87	171.11	791.98	137.91	69.50	584.57	ab
FiberMax 9180B2F	25.7	44.5	4658	1198	2075	0.5184	620.92	165.97	786.89	139.72	69.50	577.67	abc
NexGen 3348B2RF	26.4	45.4	4707	1244	2139	0.4849	603.01	171.09	774.10	141.20	68.16	564.74	abcd
Stoneville 4288B2F	25.6	45.9	4968	1273	2278	0.4617	587.64	182.25	769.89	149.05	69.50	551.35	abcd
FiberMax 9160B2F	26.6	45.2	4492	1195	2031	0.4906	586.32	162.49	748.81	134.77	69.50	544.55	abcd
Dyna-Gro 2570B2RF	29.0	48.6	4349	1260	2114	0.4543	572.39	169.11	741.50	130.47	67.70	543.33	abcd
PhytoGen 375WRF	30.4	49.3	4081	1240	2012	0.4548	563.90	160.93	724.82	122.44	67.68	534.70	abcd
NexGen 2549B2RF	26.2	44.2	4990	1307	2206	0.4277	559.17	176.44	735.61	149.69	68.16	517.76	bcde
Americot 1532B2RF	25.9	49.1	4436	1148	2179	0.4584	526.05	174.36	700.40	133.09	68.16	499.15	cdef
Deltapine 0912B2RF	23.6	39.5	4886	1155	1930	0.4786	552.51	154.36	706.87	146.59	68.96	491.32	def
FiberMax 1740B2F	27.1	40.2	4320	1171	1734	0.4688	549.04	138.75	687.79	129.59	69.50	488.70	def
Stoneville 5458B2RF	26.1	45.0	4250	1111	1913	0.4376	485.96	153.05	639.01	127.50	69.50	442.01	ef
Stoneville 4498B2RF	25.1	44.4	4252	1065	1887	0.4557	485.47	150.92	636.40	127.54	69.50	439.35	ef
Croplan Genetics 3220B2RF*	27.9	52.4	4117	1149	2157	0.4693	539.08	172.59	711.67	123.51	67.48	428.78	f
All Tex Epic RF	22.4	39.4	3422	766	1347	0.4148	317.71	107.79	425.49	102.67	56.79	266.03	g
Test average	26.6	45.5	4439	1183	2022	0.4638	550.13	161.73	711.86	133.17	68.03	504.92	
CV, %	--	--	8.9	8.9	9.0	--	8.8	9.0	8.8	8.9	--	9.9	
OSL	--	--	0.0061	<0.0001	0.0001	--	<0.0001	0.0001	<0.0001	0.0061	--	<0.0001	
LSD	--	--	661	176	302	--	80.74	24.19	104.88	19.84	--	83.31	

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 bales classed (except Croplan Genetics 3220B2RF

*** for CG 3220B2RF, no bale classing data was available due to module fire. Instead, HVI results, used to determine CCC loan values, were obtained from grab samples ginned at the Texas AgriLife Research and Extension Center near Lubbock and lint samples submitted to the Texas Tech University Fiber and Biopolymer Research Institute.**

Table 3. USDA-AMS classing results of commercially ginned bales from the irrigated large plot replicated systems variety trial, Rickey Bearden Farm, Plains, TX, 2009.

Variety		Color 1	Color 2	Staple	Leaf	Micronaire	Remarks	rd	+b	Length	Strength	Uniformity	Loan
		units	units	32nds	units	units	bales	units	units	inches	g/tex	%	$/lb
Americot 1532B2RF	Mean	2.0	1.0	35.5	3.0	2.7	8/8	82.2	7.4	1.11	26.0	78.4	0.4584
	Std Dev	0.00	0.00	0.53	0.00	0.1		0.51	0.20	0.01	0.79	0.81	0.0113
All Tex Epic RF	Mean	2.0	1.0	34.2	3.0	2.5	5/5	78.9	9.2	1.07	26.4	78.2	0.4148
	Std Dev	0.00	0.00	0.84	0.00	0.1		0.45	0.26	0.02	1.21	0.96	0.0213
Croplan Genetics 3220B2RF*	Mean	1.0	1.0	35.2	2.0	2.5	--	84.5	8.9	1.10	28.2	79.8	0.4693
	Std Dev	0.00	0.00	0.85	1.7	0.2	--	0.59	0.36	0.03	0.62	1.05	0.0366
Dyna-Gro 2570B2RF	Mean	2.0	1.0	34.5	2.9	2.7	7/8	81.6	8.4	1.07	27.1	78.4	0.4543
	Std Dev	0.00	0.00	0.53	0.35	0.0		0.81	0.29	0.02	0.87	1.14	0.0119
Deltapine 0912B2RF	Mean	1.7	1.0	34.2	3.1	3.1	8/10	80.8	8.7	1.07	27.2	79.0	0.4786
	Std Dev	0.48	0.00	0.63	0.32	0.1		1.28	0.45	0.01	0.95	1.26	0.0187
Deltapine 0924B2RF	Mean	1.9	1.0	34.3	3.0	2.9	4/7	81.7	8.2	1.07	27.3	79.1	0.4634
	Std Dev	0.38	0.00	0.49	0.00	0.1		0.31	0.23	0.01	0.56	0.85	0.0201
FiberMax 1740B2F	Mean	1.8	1.0	33.9	2.3	2.9	1/8	83.4	7.3	1.05	27.4	78.2	0.4688
	Std Dev	0.46	0.00	0.35	0.46	0.1		0.73	0.18	0.01	0.62	0.92	0.0209
FiberMax 9160B2F	Mean	2.0	1.0	36.0	2.5	2.7	2/8	83.9	7.2	1.12	28.5	80.0	0.4906
	Std Dev	0.00	0.00	0.76	0.53	0.0		0.21	0.16	0.02	0.98	0.67	0.0108
FiberMax 9170B2F	Mean	1.9	1.0	36.1	2.7	2.7	4/9	83.2	7.5	1.12	28.3	78.8	0.4821
	Std Dev	0.33	0.00	0.60	0.50	0.0		0.80	0.31	0.02	1.19	0.87	0.0144
FiberMax 9180B2F	Mean	2.0	1.0	35.6	2.5	3.0	1/8	83.9	7.0	1.11	28.9	79.9	0.5184
	Std Dev	0.00	0.00	0.52	0.53	0.1		0.31	0.12	0.02	0.97	0.43	0.0177
NexGen 2549B2RF	Mean	2.6	1.0	33.1	3.7	2.8	8/9	80.3	8.0	1.03	27.8	80.2	0.4277
	Std Dev	0.53	0.00	0.60	0.71	0.1		0.70	0.11	0.01	0.82	0.67	0.0191
NexGen 3348B2RF	Mean	2.9	1.0	35.4	4.1	3.0	6/8	79.8	7.9	1.10	28.9	80.4	0.4849
	Std Dev	0.35	0.00	0.52	0.35	0.1		0.69	0.08	0.01	0.58	0.89	0.0181
PhytoGen 375WRF	Mean	1.8	1.0	34.0	2.6	2.8	2/8	82.6	7.8	1.06	26.2	77.8	0.4548
	Std Dev	0.46	0.00	0.76	0.52	0.1		0.56	0.22	0.02	0.93	1.21	0.0183
Stoneville 4288B2F	Mean	2.0	1.0	35.2	3.2	2.7	4/9	79.9	8.6	1.10	28.2	78.4	0.4617
	Std Dev	0.00	0.00	0.67	0.44	0.1		0.47	0.18	0.01	0.90	0.90	0.0195
Stoneville 4498B2RF	Mean	2.3	1.0	35.1	4.0	2.7	1/7	79.7	8.5	1.09	28.0	79.5	0.4557
	Std Dev	0.49	0.00	1.35	1.00	0.2		1.71	0.39	0.04	1.03	1.01	0.0414
Stoneville 5458B2RF	Mean	2.4	1.0	35.0	4.0	2.7	6/8	78.7	8.7	1.09	28.2	78.0	0.4376
	Std Dev	0.52	0.00	0.53	0.00	0.1		0.80	0.26	0.01	0.91	0.60	0.0211

*** for CG 3220B2RF, no bale classing data was available due to module fire. Instead, HVI results, used to determine CCC loan values, were obtained from grab samples ginned at the Texas AgriLife Research and Extension Center near Lubbock and lint samples submitted to the Texas Tech University Fiber and Biopolymer Research Institute.**

Table 4. Total blanket inputs costs from the irrigated large plot replicated systems variety trial, Rickey Bearden Farm, Plains, TX, 2009.

Weed control program		Application method	Chemical cost $/acre	Application $/acre	Total cost $/acre
15-Mar	1 pt/acre trifluralin	Ground	$2.19	$5.00	$7.19
18-May	4 oz/acre trifluralin (10" band)	At planting	$0.55	N/A	$3.97
	0.5 oz/acre Staple (10" band)	At planting	$3.43	N/A	
1-Jul	1 qt/acre Roundup PowerMax	Ground	$13.75	$5.00	$18.75
Total Blanket Base Weed Control Program					$29.91
Insecticide program					
18-May	5 lbs/acre Temik	In-furrow	$15.25	N/A	$15.25
Total Blanket Insecticide Program					$15.25
PGR program					
None					$0.00
Total Blanket PGR program					$0.00
Harvest aid program					
8-Oct	1 qt/acre Finish	Ground	$15.75	$5.00	$31.39
	7 oz/acre Ginstar		$10.64		
19-Oct	16.0 oz/acre Gramoxone Inteon	Ground	$4.25	$5.00	$9.86
	3.2 oz/acre NIS		$0.61		
Total Blanket Harvest Aid Program					$41.25
Total blanket input cost ($/acre)					$86.41

Table 5. Stand count and NAWF results from the irrigated large plot replicated systems variety trial, Appling Farm, Blanco, TX, 2009.

Variety	Plant Population		Nodes Above White Flower (NAWF) for Week of			
	no/row ft	no/acre	27-Jul	3-Aug	10-Aug	17-Aug
FiberMax 1740B2F	2.7	34,304	6.0	5.8	5.0	3.8
All Tex Epic RF	2.6	33,650	6.5	6.3	5.3	4.3
FiberMax 9160B2F	2.6	33,585	6.4	5.9	5.1	3.8
FiberMax 9180B2F	2.7	35,349	5.8	5.7	4.9	3.5
NexGen 3348B2RF	2.7	35,349	5.9	5.8	5.0	4.0
Stoneville 4288B2F	2.4	31,363	6.1	5.7	5.0	3.5
Deltapine 0935B2RF	2.5	32,866	6.9	6.7	5.7	4.8
Croplan Genetics 3220B2RF	2.4	31,036	6.5	6.0	5.3	4.3
Dyna-Gro 2570B2RF	2.5	32,213	5.9	6.1	5.3	4.1
PhytoGen 375WRF	2.6	33,912	6.7	6.2	5.5	4.1
NexGen 2549B2RF	2.7	34,957	6.2	5.9	5.1	4.1
NexGen 3410RF	2.6	33,389	5.9	5.5	4.4	3.4
FiberMax 9058F	2.7	34,500	5.5	5.3	4.4	3.5
Deltapine 0924B2RF	2.2	28,227	6.3	5.9	5.4	3.9
Test average	2.5	33,193	6.2	5.9	5.1	3.9
CV, %	11.8	11.7	7.7	6.2	7.8	11.1
OSL	0.5016	0.4461	0.0108	0.0011	0.0010	0.0013
LSD 0.05	NS	NS	0.7	0.5	0.6	0.6

NAWF numbers represent an average of 10 plants per rep per variety for a total of 30 plants per variety.
CV - coefficient of variation, percent.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level, NS - not significant.

Table 6. Harvest results from the irrigated large plot replicated systems variety trial, Appling Farm, Blanco, TX, 2009.

Variety	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 1740B2F	36.7	46.6	3550	1303	1655	0.5556	723.84	132.42	856.26	106.50	53.18	696.58 a
All Tex Epic RF	35.3	45.1	3552	1253	1602	0.5609	702.71	128.15	830.86	106.56	43.45	680.84 ab
FiberMax 9160B2F	35.4	49.3	3453	1223	1703	0.5689	695.54	136.25	831.79	103.58	53.18	675.03 ab
FiberMax 9180B2F	33.8	48.7	3506	1187	1707	0.5712	677.80	136.58	814.38	105.18	53.18	656.02 abc
NexGen 3348B2RF	34.8	48.8	3315	1154	1618	0.5706	658.30	129.40	787.69	99.44	52.16	636.10 bcd
Stoneville 4288B2F	33.8	46.7	3468	1174	1620	0.5622	659.90	129.59	789.49	104.05	53.18	632.26 bcd
Deltapine 0935B2RF	33.6	42.6	3410	1145	1451	0.5720	654.95	116.06	771.01	102.29	52.77	615.96 cde
Croplan Genetics 3220B2RF	35.1	42.0	3479	1220	1461	0.5317	648.48	116.87	765.35	104.36	51.63	609.36 cde
Dyna-Gro 2570B2RF	31.7	41.7	3640	1154	1517	0.5622	648.75	121.33	770.09	109.18	51.81	609.09 cde
PhytoGen 375WRF	32.2	39.4	3610	1162	1422	0.5553	645.37	113.79	759.16	108.31	51.79	599.05 de
NexGen 2549B2RF	33.1	46.4	3513	1162	1632	0.5369	623.82	130.54	754.36	105.39	52.16	596.81 de
NexGen 3410RF	31.1	45.3	3537	1099	1601	0.5578	613.14	128.11	741.25	106.09	43.44	591.71 de
FiberMax 9058F	30.5	37.8	3540	1079	1339	0.5709	615.87	107.13	722.99	106.21	46.18	570.60 e
Deltapine 0924B2RF	32.3	43.1	3406	1101	1467	0.5500	605.63	117.37	723.00	102.17	52.77	568.06 e
Test average	33.5	44.5	3498	1173	1557	0.5590	655.29	124.54	779.83	104.95	50.78	624.11
CV, %	--	--	4.6	4.7	4.6	--	4.6	4.6	4.6	4.6	--	5.0
OSL	--	--	0.6178	0.0019	<0.0001	--	0.0012	<0.0001	0.0016	0.6173	--	0.0002
LSD	--	--	NS	92	120	--	50.92	9.59	60.50	NS	--	52.38

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 bales classed

Table 7. USDA-AMS classing results of commercially ginned bales from the irrigated large plot replicated systems variety trial, Appling Farm, Blanco, TX, 2009.

Variety		Color 1	Color 2	Staple	Leaf	Micronaire	Remarks	rd	+b	Length	Strength	Uniformity	Loan
		units	units	32nds	units	units	bales	units	units	inches	g/tex	%	$/lb
FiberMax 1740B2F	Mean	1.9	1.0	34.8	1.9	4.3	0/12	83.1	7.4	1.09	29.4	80.7	0.5556
	Std Dev	0.51	0.00	0.45	0.29	0.1		0.93	0.21	0.01	0.56	0.60	0.0092
All-Tex Epic RF	Mean	1.8	1.0	34.9	2.0	3.8	0/12	81.4	8.2	1.09	29.3	81.3	0.5609
	Std Dev	0.45	0.00	0.29	0.00	0.1		0.19	0.14	0.01	0.53	0.48	0.0062
FiberMax 9160B2F	Mean	1.6	1.0	35.8	1.8	4.2	0/12	82.7	7.9	1.11	29.4	81.4	0.5689
	Std Dev	0.51	0.00	0.62	0.39	0.1		0.76	0.14	0.02	1.20	0.81	0.0055
FiberMax 9180B2F	Mean	2.0	1.0	36.2	2.2	4.3	0/12	83.5	6.6	1.13	30.9	81.1	0.5712
	Std Dev	0.00	0.00	0.72	0.39	0.1		0.63	0.18	0.02	0.57	0.92	0.0040
NexGen 3348B2RF	Mean	2.0	1.0	36.0	2.4	4.3	0/12	80.7	8.1	1.12	30.6	82.3	0.5706
	Std Dev	0.00	0.00	0.43	0.51	0.1		0.11	0.17	0.01	0.71	0.56	0.0046
Stoneville 4288B2RF	Mean	2.0	1.0	35.3	2.0	4.4	0/12	81.7	8.1	1.10	29.3	81.0	0.5622
	Std Dev	0.43	0.00	0.65	0.00	0.1		0.99	0.26	0.02	0.78	0.70	0.0090
Deltapine 0935B2RF	Mean	2.0	1.0	36.0	2.1	4.0	0/11	83.5	7.3	1.12	30.5	81.7	0.5720
	Std Dev	0.00	0.00	0.45	0.54	0.0		0.47	0.16	0.01	0.51	0.52	0.0036
Croplan Genetics 3220B2RF	Mean	1.2	1.0	33.6	1.9	4.0	0/10	82.5	8.5	1.05	28.0	80.0	0.5317
	Std Dev	0.42	0.00	0.70	0.32	0.1		0.46	0.22	0.02	0.62	0.83	0.0149
Dyna-Gro 2570B2RF	Mean	2.0	1.0	35.1	2.0	4.3	0/12	81.8	8.0	1.09	29.8	81.7	0.5622
	Std Dev	0.00	0.00	0.51	0.43	0.1		0.19	0.12	0.02	1.06	1.12	0.0103
PhytoGen 375WRF	Mean	2.0	1.0	34.7	2.0	4.2	0/11	82.3	7.6	1.08	28.7	80.7	0.5553
	Std Dev	0.00	0.00	0.47	0.00	0.1		0.73	0.07	0.01	0.86	0.73	0.0094
NexGen 2549B2RF	Mean	2.0	1.0	33.8	2.7	4.2	0/12	80.9	7.8	1.05	29.2	81.5	0.5369
	Std Dev	0.00	0.00	0.58	0.49	0.1		0.30	0.14	0.01	0.97	0.83	0.0108
NexGen 3410RF	Mean	2.9	1.0	37.0	3.3	3.9	2/12	79.7	7.8	1.16	31.5	81.6	0.5578
	Std Dev	0.29	0.00	0.00	0.49	0.1		0.21	0.19	0.01	0.81	0.69	0.0114
FiberMax 9058F	Mean	2.1	1.0	36.7	2.3	4.0	0/11	82.8	7.1	1.14	29.7	80.6	0.5709
	Std Dev	0.30	0.00	0.47	0.47	0.1		0.33	0.10	0.01	1.31	0.47	0.0036
Deltapine 0924B2RF	Mean	1.6	1.0	34.5	2.1	4.2	0/11	82.3	7.9	1.07	29.0	81.2	0.5500
	Std Dev	0.50	0.00	0.69	0.30	0.1		0.48	0.13	0.02	0.66	0.54	0.0136

Table 8. Total blanket inputs costs from the irrigated large plot replicated systems variety trial, Appling Farm, Blanco, TX, 2009.

Weed control program		Application method	Chemical cost $/acre	Application $/acre	Total cost $/acre
Pre-plant	1 qt/acre trifluralin	Ground	$4.38	$5.00	$9.38
16-Jun	22 oz/acre Roundup PowerMax	Ground	$9.45	$5.00	$14.45
15-Jul	22 oz/acre Roundup PowerMax	Ground	$9.45	$5.00	$14.45
26-Aug	22 oz/acre Roundup PowerMax	Ground	$9.45	$5.00	$14.45
Total Blanket Base Weed Control Program					$52.73
Insecticide program					
16-Jun	3.0 oz/acre acephate	Ground	$1.21	Applied w/ R-up	$1.21
Total Blanket Insecticide Program					$1.21
PGR program					
None					$0.00
Total Blanket PGR program					$0.00
Harvest aid program					
8-Oct	1 qt/acre Finish 6 oz/acre Ginstar	Ground	$15.75 $9.12	$5.00	$29.87
Total Blanket Harvest Aid Program					$29.87
Total blanket input cost ($/acre)					$83.81

Replicated Large Plot Picker vs. Stripper Harvester Comparisons

2009 Picker vs. Stripper Harvester Comparisons

In 2007 Case-IH first commercialized the Module Express 625 spindle picker with on-board moduling. This same year, John Deere tested the 7760 prototype spindle picker in several regions in the U.S. Cotton Belt. With the commercialization of these module-building pickers, many High Plains producers are questioning the harvesting efficiency of these machines when compared to brush roll stripper harvesters. In addition to the harvesting efficiency, many producers are asking about ultimate fiber quality. In 2009, picker vs. stripper harvester comparisons were established within the Systems Variety Test at Plains (Bearden Farm), Acuff (Mimms Farm), and Ralls (Verett Farm) to help address these questions. These trials were established to facilitate commercial harvest, module construction, and commercial ginning of both picker and stripper harvested plots. At Plains plot sizes of four entries were doubled to facilitate both picker and stripper harvesting. The Acuff site included the same four entries and design. **At these sites, three replicates from the field were combined into a single module for each variety/harvester combination.** An additional site was established at Ralls and utilized a field planted to a single commercial variety. **At this site, the experimental units were module sized and replicated four times therefore, each treatment consisted of four modules.** Dr. John Wanjura, with USDA-Agricultural Research Service (ARS) Cotton Production and Processing Unit at Lubbock provided vital logistical and harvesting support for the John Deere 9996 basket picker used in these trials. This picker was available per a lease agreement with John Deere and the USDA-ARS at Lubbock. The objectives of these trials were to compare picker and stripper harvesting methods in commercial, large-scale settings to determine subsequent yield, fiber quality (HVI, AFIS), and yarn quality in the Texas High Plains. Results from this project should help answer producer questions concerning some components of harvester type economics and could determine potential quality improvements to make High Plains cotton more competitive in the export market.

Materials and Methods

Plains (Yoakum County)

Rickey Bearden Farm (J.W. Wagner, CEA-ANR)

Clean-tillage following Roundup Ready soybeans

Irrigation: Low elevation spray, straight rows

Plot Size: 24 40-inch rows for varieties; 12 each for picker and stripper

Experimental design: Split plot, varieties as main plot, harvester type as subplot, 3 replications, all replicates combined for each variety/harvester module

Area: Variable (0.9 to 1.2 acres/plot), 3 replications of each variety and variety/harvest method

Planted: May 18 at 4 seed/per row-ft, or 52,272 seed/acre

Partially defoliated by high wind/blowing sand/hail event on July 17.

Harvested: November 19-20

Varieties planted at this site included:

1. Americot 1532B2RF
2. FiberMax 9160B2F
3. FiberMax 9170B2F
4. FiberMax 9180B2F

Ginning: Differential ginning for picked cotton was performed by NewTex Gin, Plains, TX. One stick machine was bypassed in pre-cleaning and one lint cleaner was bypassed for picker harvested modules. Stripper harvested modules encountered two stage of lint cleaning.

Harvesters: Picker - John Deere 9996
Stripper John Deere 7460 with field cleaner

Temik was applied infurrow at planting at a rate of 5 lbs/acre. This location was in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Foundation.

No PGR applications were made at this site in 2009.

Harvest Aid Program: Harvest aids applied by the producer included, October 8, 1.0 qt/acre Finish 6 Pro with 7 oz/acre Ginstar EC followed by a sequential application of 16.0 oz/acre Gramoxone Inteon with 3.2 oz/acre non-ionic surfactant (NIS) on October 19.

Since the picker vs. stripper harvesting component was embedded in the overall Plains Systems Variety trial, it should be noted that this site struggled during early stand establishment and was partially defoliated by a high wind/blowing sand/hail event on July 17. Significant verticillium wilt pressure was eventually observed at this location which may have reduced yield and quality for some less tolerant varieties.

Acuff (Lubbock County)

Mimms Farm (Mark Brown, CEA-ANR)

Minimum tillage with terminated rye in alternate rows

Irrigation: SDI (sub-surface drip irrigation, alternate furrow 80-inch tape)

Plot Size: 16 40-inch rows/plot (8 rows harvested with picker and 8 harvested with stripper)

Experimental design: Split plot, varieties as main plot, harvester type as subplot, 3 replications, all replicates combined for each variety/harvester module

Area: 1.44 acres/plot

Planted: May 11 at 4.1 seed/per row-ft, or ~53,500 seed/acre

Harvested: November 2

Varieties planted at this site included:

1. Americot 1532B2RF
2. FiberMax 9160B2F
3. FiberMax 9170B2F
4. FiberMax 9180B2F

Ginning: Performed by Rex Tomlinson, Acuff-McClung Co-op Gin, Acuff, TX. No differential ginning was performed at this site. All modules were ginned as stripper cotton with two stages of lint cleaning. Therefore, all fiber quality differences can be directly attributed to the picker harvester.

Harvesters: Picker - John Deere 9996
Stripper - John Deere 7460 with field cleaner

Temik was applied infurrow at planting at a rate of 3.5 lbs/acre. This location was in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Foundation.

PGR Program: An application of 2.0 oz/acre Stance was applied with Roundup PowerMax on June 26 and an additional application of 3.0 oz/acre Stance was applied on July 28.

Harvest Aid Program: Harvest aids applied by the producer on October 15 included 21.0 oz/acre Prep and 0.6 oz/acre Blizzard. No sequential application was required.

Ralls (Crosby County)

Steve, Kris, Eddie, and Heath Verett (Tyler Hawthorne, CEA-ANR)

Minimum tillage (stalks cut, disk bedder, rod weeder)

Irrigation: SDI (sub-surface drip irrigation, alternate furrow 80-inch tape)

Plot Size: Stripper - 16 40-inch rows/plot in replicates 1-3, 24 rows in replicate 4; Picker with picker ginning - 20 rows/plot in replicates 1-3, 24 rows in replicate 4; Picker with stripper ginning - 20 rows/plot in replicates 1-3, 24 rows in replicate 4.

Experimental design: Randomized complete block design with 4 replicates, each individual plot was a module.

Area: Stripper - 3.335 and 4.525 acres/plot for replicates 1-3 and 4, respectively; Picker with picker ginning - 4.193 and 4.525 acres/plot for replicates 1-3 and 4, respectively; Picker with stripper ginning - 4.193, 4.024, and 4.525 acres/plot for replicates 1-2, 3, and 4, respectively.

Planted on May 15 to FiberMax 9180B2F

Harvested on November 16

Treatments harvested at this site included:

1. Stripper harvesting and stripper ginning (Stripper System)
2. Picker harvesting and picker ginning (Picker System)
3. Picker harvesting and stripper ginning

Ginning: Differential ginning was performed at this site by Steve Newton, Owens Co-op Gin, Ralls, TX. For Picker System modules, a combination bur and 3-saw stick machine and one lint cleaner was bypassed. Picker harvested with stripper ginning received the same ginning sequence as Stripper System which included two stages of lint cleaning.

Harvesters: Picker - John Deere 9996
Stripper - John Deere 7460 with field cleaner

Seed was Cruiser treated. This location was in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Foundation.

PGR Program: No PGR products were applied at this site.

Harvest Aid Program: No harvest aid products were applied at this site.

In order to more fully determine fiber quality and spinning characteristics, one bale per module from each site was purchased by the Texas Tech University Fiber and Biopolymer Institute (FBRI). Fiber quality will be analyzed in a detailed manner using Advanced Fiber Information System (AFIS) testing and spinning tests will be conducted.

Commodity Credit Corporation (CCC) 2009 loan values were determined based on the average USDA-AMS classing results for all bales in each respective module. In 2009 ginning costs were established at $3.00/cwt and seed values were set at $160/ton. For harvesting cost comparisons, custom harvesting rates of $0.10/lint-lb for spindle picking and $0.08/lint-lb for stripper harvesting were used. Since this does not include the overall cost of ownership, possible increased farm operation efficiencies, etc, this overall comparison must be used with caution. Data were subjected to analysis of variance where applicable.

Results and Discussion

Plains Site

Results from the picker vs. stripper comparison across varieties at Plains are presented in Tables 1 and 2. Due mostly to field variability, significant variety by harvest method interactions were observed at this location. When comparing harvest method within variety, stripper harvesting resulted in significantly greater lint yield for Americot 1532B2RF and FiberMax 9160B2F when compared to picker harvesting but not for FiberMax 9170B2F or FiberMax 9180B2F (Table 1). The same relationship was observed in seed yield, lint value, seed value, total value, harvest cost and net value/acre.

When averaged across varieties and replications for main effect of harvest method, lint turnout was increased by 4.8%, and seed turnout increased by 6.7% with picker harvesting (Table 1). Picker harvesting reduced by 1010 lb/acre the amount of harvested material taken to the gin, and this is reflected in higher lint and seed turnout and lower lint yield. Lint yield was reduced by 96 lb/acre by picker harvesting (1111 lb/acre) when compared to stripper harvesting (1207 lb/acre). Due to the reduction in the amount of seed cotton harvested, seed yield was also reduced by 227 lb/acre by the picker harvester. Differences were observed in CCC loan value for lint when comparing harvester methods and the overall loan value was increased at this site by $0.0287/lb by picker harvesting. Although not statistically significant, when combining lint and seed values into total value, picker harvesting resulted numerically in $29.74/acre less income. Reduced ginning cost

associated with the picker was $30.30/acre. When custom harvesting cost is assumed at $0.10/lint-lb for picking and $0.08/lint-lb for stripper harvesting, the overall net value per acre was not statistically different for picker harvesting when compared to stripper harvesting at this site.

When picker harvesting, the fiber data indicated improvements in some fiber quality characteristics when averaged across commercially ginned and classed bales by variety at this location (Table 2). Micronaire was improved on average by 0.3 units by picking compared to stripping. Staple was slightly improved by picking by about 0.5 32nd of an inch. Strength was not greatly affected by harvester method. However, uniformity and leaf grade were slightly improved. Color grades were similar with the majority 21. Bark contamination was present in about 45% of the stripper harvested bales and was present in only 3% of the picker harvested bales. Level 1 bark contamination was a 225 point discount in the loan chart in 2009. At this site, benefits from picker harvesting provided significant improvements in quality and thus loan value in 2009.

Acuff Site

Four varieties common to the Plains location picker vs. stripper comparison were planted at this site. Unlike the Plains location, no significant interactions were observed and therefore, main effect means for variety and harvest method will be exclusively discussed. Plant population and nodes above white flower (NAWF) data are presented in Table 3 by variety. Plant stands averaged 45,194 plants/acre on June 12 and no significant differences were observed among varieties. Plants/acre ranged from a high of 47,176 for Americot 1532B2RF to a low of 42,602 for FiberMax 9180B2F. Four observations of NAWF were performed. Field averages on July 20, July 27, August 3 and August 10 were 7.6, 5.8, 4.3, and 2.9 NAWF, respectively. Significant differences were observed only on July 27 with a high of 6.2 for FiberMax 9160B2F and a low of 5.4 for FiberMax 9170B2F. All varieties had reached cutout (< NAWF 5) by the August 3 observation date.

When averaged across replication and harvest method, lint turnout was highest for FiberMax 9160B2F (34.6%) and lowest for Americot 1532B2RF (31.9%) (Table 4). Bur cotton yields ranged from 4647 lb/acre for FiberMax 9180B2F to 4215 lb/acre for Americot 1532B2RF. Lint yields ranged from 1551 lb/acre for FiberMax 9180B2F to 1325 lb/acre for Americot 1532B2RF. Lint loan values ranged from $0.5634 for FiberMax 9160B2F to $0.5403 for FiberMax 9170B2F. After totaling lint and seed value per acre and subtracting out ginning costs, seed and technology costs, and harvest cost, the net value per acre ranged from a low of $564.58 for Americot 1532B2RF to a high of $675.87 for FiberMax 9180B2F, a difference of $111.29. FiberMax 9180B2F and FiberMax 9160B2F were similar in terms of net value.

For main effect of harvest method (averaged across replication and variety), lint turnout was increased by 6.4%, and seed turnout increased by 7.8% with picker harvesting. Picker harvesting reduced by 1187 lb/acre the amount of harvested material taken to the gin, and this is reflected in higher lint and seed turnout and lower lint yield. Lint yield was reduced by 116 lb/acre by picker harvesting (1402 lb/acre) when compared to stripper harvesting (1518 lb/acre). Due to the reduction in the amount of seed cotton harvested, seed yield was also reduced by 175 lb/acre by the picker harvester. Differences were observed in CCC loan value for lint when comparing harvester methods and loan value was increased at this site by $0.0256/lb by picker harvesting. When combining lint and seed values into total value, picker harvesting resulted in $40.75/acre less income. Reduced ginning cost associated with the picker was $35.62/acre. When custom harvesting cost is assumed at $0.10/lint-lb for picking and $0.08/lint-lb for stripper harvesting, the overall net value per acre is $23.92 statistically lower for picker harvesting than stripper harvesting at this site.

Fiber quality data derived from commercially ginned bales were averaged by variety by harvest method with results reported in Table 5. Americot 1532B2RF (Picker) had the highest average

micronaire of 3.9 and FiberMax 9170B2F (Stripper) had the lowest with 3.2. The highest average staple was observed for stripper harvested FiberMax 9180B2F (38.2) and lowest for picker harvested Americot 1532B2RF (36.9). Leaf was improved by an average of 1.2 units when picker harvesting. Average uniformity ranged from a high of 82.0% (FiberMax 9180B2F-stripper) to a low of 80.1% (FiberMax 9170 B2F-picker). Fiber strength average values ranged from a high of 31.8 g/tex for picker harvested FiberMax 9160B2F to a low of 27.7 g/tex for both harvest methods of Americot 1532B2RF. Color grades were predominantly 21 and 31. Average reflectance (Rd) ranged from a high of 84.4 (FiberMax 9170B2F picker harvested) to a low of 80.9 (Americot 1532B2RF stripper harvested). The highest +b (yellowness) value of 7.6 was observed for stripper harvested Americot 1532B2RF and the lowest value of 6.5 was observed for picker harvested FiberMax 9180B2F. When based on loan value, picker harvesting improved fiber quality at this site. When comparing harvest method some minor differences were observed, however, bark contamination was substantially reduced by picker harvesting. None of the picker harvested bales contained bark contamination compared to 56% of the stripper harvested bales.

Ralls Site

Results from the Ralls site are presented in Tables 6 and 7. This site was very uniform due to subsurface drip irrigation and more standardized plot sizes. Picker System and Stripper System comparisons will be discussed, as the Picker with stripper ginning component will have a fiber and yarn quality emphasis by the Fiber and Biopolymer Research Institute. Lint turnout was increased by 6.6%, and seed turnout increased by 6.5% with the Picker System (Table 6). The Picker System reduced by 1113 lb/acre the amount of harvested material taken to the gin, and this is reflected in higher lint and seed turnout and lower lint yield. Lint yield was reduced by 121 lb/acre with the Picker System (1040 lb/acre) when compared to Stripper System (1161 lb/acre). Due to the reduction in the amount of seed cotton harvested, seed yield was also reduced by 293 lb/acre by the Picker System. Significant differences were observed in CCC loan value for lint when comparing harvester systems and loan value was increased at this site by $0.0549/lb by the Picker System. When combining lint and seed values into total value, picking resulted in about $28/acre less income. Reduced ginning cost associated with the picker was about $33/acre. When custom harvesting cost is assumed at $0.10/lint-lb for picking and $0.08/lint-lb for stripper harvesting, the overall net value per acre is not statistically different, and is numerically about $6 lower for the Picker System than the Stripper System at this site.

When comparing the USDA-AMS commercial classing data for the Picker System and the Stripper System improvements in some fiber quality characteristics were noted. Results for commercially ginned and classed bales at this location can be found in Table 7. Micronaire was significantly improved at this site (0.5 unit above stripper for picker). Staple and strength were unaffected by harvesting system. Uniformity was improved by 1% by the Picker System. Color grades were similar with the majority 21 and 31 color. Bark contamination was present in about 96% of the Stripper System bales and none was noted in the Picker System bales. At this site, benefits from the Picker System provided significant improvements in quality when compared to the Stripper System, especially for micronaire, uniformity, and bark contamination.

Summary and Conclusions

In September and October 2009, cool temperatures resulted in poor heat unit accumulation which had a detrimental impact on fiber maturity in many fields. Exhibiting marginal micronaire and high bark contamination potential, 2009 was a year where fiber quality improvements should be observed when picking compared to stripping. Differential ginning of spindle picked cotton was utilized at two sites (Plains and Ralls) and was not used at Acuff. At the sites where differential ginning was used, somewhat less pre-cleaning (bypass of a stick machine) and only one stage of

lint cleaning was used (instead of the normal two stages for stripper harvested cotton). Therefore, the two sites where differential ginning was employed should be considered the entire "Picker System" compared to the "Stripper System." Any potential differences between picking and stripping at the Acuff site should be fully attributed to the picker harvester only.

Improvements in commercial classing quality and subsequent CCC loan value were observed at all sites due to picking when compared to stripper harvesting. Micronaire was improved with picking by 0.3, 0.1, and 0.5 units at the three sites. Staple was improved by picking at two sites, and ranged from 0.3 to 0.5 32nd inch longer. Higher uniformity was observed due to picking at two sites and ranged from a difference of 0.8 to 1%. Strength was essentially unaffected by harvesting methods at all sites. Leaf grades were slightly better due to picker harvest at two of three sites and ranged from a difference of 0.3 to 0.5 units. Color grades were generally similar or slightly better at all sites with picker harvesting. Color grades of 11, 21 and 31 were predominant at all locations. Bark contamination was substantially reduced due to picker harvesting at all sites (3%, 0%, and 0%) when compared to stripper harvesting (45, 56, and 96%). Gains in lint loan value were $0.0286, $0.0256, and $0.0549 per pound at Plains, Acuff, and Ralls, respectively.

When compared to stripper harvesting, lint yield was reduced by picking by 96, 116, and 121 lb/acre, respectively at Plains, Acuff, and Ralls. Corresponding reductions in seed yields on a per acre basis were also observed at all sites. Field and plot area variability affected the outcome of data analysis at one site (Plains). Picker harvesting exhibited a positive impact on gin turnouts. At the three sites where field cleaners were utilized on the stripper harvester, lint turnouts were substantially increased by picking (4.8%, 6.4%, and 6.6% for an average of 5.9%). This results in fewer pounds of harvested cotton (modules) having to be transported to the gin when picker harvesting compared to stripper harvesting, however more lint and seed would also be left in the field. When factoring these components into the analysis where uniform sub-surface drip irrigated trials were established (Acuff and Ralls), the overall net value/acre (when using custom harvest rates of $0.10 for picking and $0.08 for stripping) did not indicate any advantage to picker harvesting. The Acuff site's results indicate about $24/acre difference to the advantage of the stripper when using loan value as lint value and the other assumptions. The Ralls site was statistically equivalent for the picker and stripper in terms of net value/acre when these assumptions are used. Since this custom harvest cost does not include direct ownership, and the value of potential increased farm operation efficiencies, etc, this comparison must be used with caution. Although picker harvesters are more expensive to purchase and maintain, some advantages can be obtained. These advantages could include less expense for some inputs such as plant growth regulators (pickers can harvest larger cotton easier than strippers), and reduced harvest aid costs (no terminating paraquat application after ethephon treatment is required for picker as opposed to stripper harvest). None of these potential management changes were addressed in this work due to the lateness of the fields utilized. It should be noted that at the Plains site, due to the lateness of harvest (November 20), brittle stalks resulted in plugging of the picker row units in some entries during plot harvest. This substantially increased harvest difficulty for the picker. Picker harvesting can many times be initiated earlier and conclude later in the day than stripper harvesting. This in turn could reduce the length of the harvest window on a large operation. The value of this across sizeable high yielding irrigated acreage is difficult to establish. The overall economics of the entire package of improved farm operation efficiency must be weighed heavily by producers in the Texas High Plains when considering the purchase of module-building pickers. Picker harvesting of high yielding fields may play a role in helping to develop strategies to produce fiber that is more competitive in the global market. Subsequent detailed AFIS and spinning testing by the FBRI should provide more information to producers concerning the potential impacts of both picker harvesting and differential ginning when compared to the Stripper System.

Acknowledgments

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Table 1. Harvest results from the irrigated large plot replicated systems variety by harvest method trial, Rickey Bearden Farm, Plains, TX, 2009.

	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	Harvest cost	Net value	
	-------- % --------		---------- lb/acre ----------			$/lb	---------- $/acre ----------							
Variety														
FiberMax 9180B2F	29.0	49.6	4266	1224	2097	0.5354	655.61	167.73	823.34	127.97	69.50	110.39	515.48	a
FiberMax 9170B2F	32.1	52.3	4068	1284	2097	0.5050	648.42	167.73	816.14	122.03	69.50	115.55	509.06	a
FiberMax 9160B2F	28.0	47.2	3960	1100	1857	0.4959	545.14	148.57	693.71	118.78	69.50	98.08	407.36	b
Americot 1532B2RF	26.7	49.7	3870	1027	1919	0.4706	481.89	153.52	635.41	116.10	68.16	91.25	359.90	b
OSL	--	--	0.3634	0.0228	0.1469	--	0.0047	0.1472	0.0093	0.3634	--	0.0203	0.0041	
LSD (0.05)	--	--	NS	154	NS	--	79.98	NS	101.06	NS	--	14.32	71.26	
Harvest method														
Picker	31.3	53.0	3536	1111	1879	0.5160	576.99	150.29	727.28	106.07	69.17	111.07	440.98	
Stripper	26.6	46.4	4546	1207	2106	0.4874	588.54	168.48	757.02	136.37	69.17	96.56	454.92	
Difference (picker - stripper)	4.8	6.7	-1010	-96	-227	0.0287	-11.55	-18.19	-29.74	-30.30	--	14.51	-13.94	
OSL	--	--	<0.0001	0.0066	0.0008	--	0.4264	0.0008	0.1228	<0.0001	--	0.0004	0.2904	
LSD (0.05)	--	--	192	61	100	--	NS	7.99	NS	5.76	--	5.81	NS	
Variety x harvest method														
OSL	--	--	0.5009	0.0122	0.0069	--	0.0050	0.0068	0.0055	0.4996	--	0.0067	0.0022	
CV, %	--	--	5.1	5.6	5.3	--	5.8	5.3	5.7	5.0	--	5.9	6.7	
FiberMax 9180B2F (Picker)	32.3	54.7	3874	1250	2119	0.5524	690.30	169.49	859.79	116.21	69.50	124.97	549.11	a
FiberMax 9170B2F (Picker)	36.2	58.1	3539	1281	2054	0.5278	675.96	164.34	840.30	106.16	69.50	128.08	536.57	a
FiberMax 9180B2F (Stripper)	25.7	44.5	4658	1198	2075	0.5184	620.92	165.97	786.89	139.72	69.50	95.81	481.85	ab
FiberMax 9170B2F (Stripper)	28.0	46.5	4597	1288	2139	0.4821	620.87	171.11	791.98	137.91	69.50	103.02	481.55	ab
FiberMax 9160B2F (Stripper)	26.6	45.2	4492	1195	2031	0.4906	586.32	162.49	748.81	134.77	69.50	95.60	448.94	bc
Americot 1532B2RF (Stripper)	25.9	49.1	4436	1148	2179	0.4584	526.05	174.36	700.40	133.09	68.16	91.81	407.33	cd
FiberMax 9160B2F (Picker)	29.3	49.1	3427	1005	1683	0.5012	503.96	134.65	638.61	102.80	69.50	100.55	365.77	de
Americot 1532B2RF (Picker)	27.5	50.2	3304	907	1658	0.4827	437.73	132.68	570.42	99.11	68.16	90.69	312.46	e
Test avg	28.9	49.7	4041	1159	1992	0.5017	582.76	159.39	742.15	121.22	69.17	103.82	447.95	
CV, %	--	--	7.1	7.5	7.3	--	7.7	7.3	7.6	7.1	--	7.8	9.0	
OSL	--	--	<0.0001	0.0008	0.0025	--	<0.0001	0.0025	0.0002	<0.0001	--	0.0002	<0.0001	
LSD (0.05)			502	151	256		78.80	20.49	99.25	15.05		14.20	70.28	

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.
$0.08/lb lint for stripper and $0.10/lb lint for picker.
Value for lint based on CCC loan value from bales classed

Table 2. USDA-AMS classing results of commercially ginned bales from the irrigated large plot replicated systems variety by harvest method trial, Rickey Bearden Farm, Plains, TX, 2009.

Variety	Harvest method		Color 1	Color 2	Staple	Leaf	Micronaire	Remarks	rd	+b	Length	Strength	Uniformity	Loan
			units	units	32nds	units	units	bales	units	units	inches	g/tex	%	$/lb
Americot 1532B2RF	Picker	Mean	2.2	1.0	35.8	3.0	2.9	0/6	83.5	6.9	1.11	25.8	79.3	0.4827
		Std Dev	0.41	0.00	0.41	0.00	0.0		0.38	0.15	0.01	1.02	0.88	0.0105
FiberMax 9160B2F	Picker	Mean	2.0	1.0	36.3	2.0	2.9	0/7	84.7	6.6	1.13	28.5	80.3	0.5012
		Std Dev	0.00	0.00	0.49	0.58	0.0		0.24	0.15	0.02	0.97	0.76	0.0036
FiberMax 9170B2F	Picker	Mean	2.0	1.0	36.7	2.1	3.2	0/9	84.6	6.7	1.14	27.6	79.2	0.5278
		Std Dev	0.00	0.00	0.50	0.33	0.5		0.72	0.22	0.02	1.78	0.71	0.0108
FiberMax 9180B2F	Picker	Mean	2.1	1.0	36.5	2.6	3.6	1/8	83.8	6.5	1.14	28.7	81.5	0.5524
		Std Dev	0.35	0.00	0.53	0.52	0.4		0.83	0.21	0.01	1.52	1.00	0.0120
Picker Mean			2.1	1.0	36.3	2.4	3.1	3%	84.1	6.7	1.1	27.6	80.1	0.5160
Americot 1532B2RF	Stripper	Mean	2.0	1.0	35.5	3.0	2.7	8/8	82.2	7.4	1.11	26.0	78.4	0.4584
		Std Dev	0.00	0.00	0.53	0.00	0.1		0.51	0.20	0.01	0.79	0.81	0.0113
FiberMax 9160B2F	Stripper	Mean	2.0	1.0	36.0	2.5	2.7	2/8	83.9	7.2	1.12	28.5	80.0	0.4906
		Std Dev	0.00	0.00	0.76	0.53	0.0		0.21	0.16	0.02	0.98	0.67	0.0108
FiberMax 9170B2F	Stripper	Mean	1.9	1.0	36.1	2.7	2.7	4/9	83.2	7.5	1.12	28.3	78.8	0.4821
		Std Dev	0.33	0.00	0.60	0.50	0.0		0.80	0.31	0.02	1.19	0.87	0.0144
FiberMax 9180B2F	Stripper	Mean	2.0	1.0	35.6	2.5	3.0	1/8	83.9	7.0	1.11	28.9	79.9	0.5184
		Std Dev	0.00	0.00	0.52	0.53	0.1		0.31	0.12	0.02	0.97	0.43	0.0177
Stripper Mean			2.0	1.0	35.8	2.7	2.8	45%	83.3	7.3	1.1	27.9	79.3	0.4874
Difference (picker - stripper)			0.1	0.0	0.5	-0.2	0.3	-42%	0.9	-0.6	0.0	-0.3	0.8	0.0286

Table 3. Stand count and NAWF results from the irrigated large plot replicated cotton systems variety by harvest method trial, Brady Mimms Farm, Acuff, TX, 2009.

Variety	Plant Population		Nodes Above White Flower (NAWF) for Week of			
	no/row ft	no/acre	20-Jul	27-Jul	3-Aug	10-Aug
Americot 1532B2RF	3.6	47,176	7.6	5.8	4.3	2.8
FiberMax 9160B2F	3.5	45,389	7.7	6.2	4.8	3.6
FiberMax 9170B2F	3.5	45,608	7.6	5.4	4.0	2.5
FiberMax 9180B2F	3.3	42,602	7.7	5.6	3.9	2.6
Test average	3.5	45,194	7.6	5.8	4.3	2.9
CV, %	6.0	6.4	3.6	5.6	16.2	19.1
OSL	0.1196	0.1432	0.4914	0.0962	0.4245	0.1870
LSD 0.05	NS	NS	NS	0.5†	NS	NS

NAWF numbers represent an average of 10 plants per rep per variety for a total of 30 plants per variety.
CV - coefficient of variation, percent.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level, †denotes significance at the 0.10 level, NS - not significant.

Table 4. Harvest results from the irrigated large plot replicated cotton systems variety by harvest method trial, Brady Mimms Farm, Acuff, TX, 2009.

	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	Harvest cost	Net value
	-------- % --------		---------- lb/acre ----------			$/lb	---------- $/acre ----------						
Variety													
FiberMax 9180B2F	33.9	45.0	4647	1551	2058	0.5555	860.86	164.61	1025.48	139.40	71.13	139.08	675.87 a
FiberMax 9160B2F	34.6	44.4	4335	1483	1905	0.5634	835.15	152.42	987.57	130.06	71.13	132.87	653.51 ab
FiberMax 9170B2F	33.9	42.0	4425	1481	1840	0.5403	799.29	147.16	946.44	132.76	71.13	132.63	609.92 bc
Americot 1532B2RF	31.9	42.7	4215	1325	1779	0.5569	737.26	142.31	879.58	126.45	69.76	118.78	564.58 c
OSL	--	--	0.0816	0.0088	0.0126	--	0.0087	0.0125	0.0097	0.0818	--	0.0092	0.0062
LSD (0.05)	--	--	261†	103	139	--	57.57	11.13	68.69	7.84†	--	9.33	49.51
Harvest method													
Picker	36.8	47.4	3812	1402	1808	0.5668	794.77	144.62	939.39	114.36	70.79	140.23	614.01 b
Stripper	30.4	39.7	4999	1518	1983	0.5412	821.52	158.63	980.14	149.98	70.79	121.45	637.93 a
Difference (picker - stripper)	6.4	7.8	-1187	-116	-175	0.0256	-26.75	-14.01	-40.75	-35.62	--	18.78	-23.92
OSL	--	--	<0.0001	<0.0001	<0.0001	--	0.0053	<0.0001	0.0012	<0.0001	--	<0.0001	0.0042
LSD (0.05)	--	--	88	30	37	--	16.29	2.96	19.23	2.64	--	2.91	13.93
Variety x harvest method													
OSL	--	--	0.3610	0.6282	0.6679	--	0.5347	0.6696	0.5867	0.3612	--	0.5910	0.2840
CV, %	--	--	2.1	2.2	2.1	--	2.1	2.1	2.1	2.1	--	2.4	2.4
FiberMax 9180B2F (Stripper)	30.2	40.2	5299	1602	2127	0.5423	868.71	170.20	1038.92	158.97	71.13	128.15	680.66 a
FiberMax 9160B2F (Stripper)	31.7	40.9	4887	1547	1999	0.5538	856.94	159.96	1016.90	146.62	71.13	123.79	675.36 ab
FiberMax 9180B2F (Picker)	37.6	49.8	3994	1500	1988	0.5687	853.02	159.01	1012.04	119.84	71.13	150.00	671.08 ab
FiberMax 9160B2F (Picker)	37.5	47.9	3783	1419	1811	0.5730	813.36	144.88	958.24	113.50	71.13	141.94	631.66 bc
FiberMax 9170B2F (Stripper)	31.0	38.6	5004	1550	1933	0.5250	813.66	154.61	968.27	150.13	71.13	123.98	623.03 c
FiberMax 9170B2F (Picker)	36.7	45.4	3846	1413	1746	0.5556	784.91	139.70	924.61	115.39	71.13	141.27	596.82 cd
Americot 1532B2RF (Stripper)	28.6	38.9	4806	1373	1872	0.5438	746.75	149.73	896.47	144.19	69.76	109.86	572.67 d
Americot 1532B2RF (Picker)	35.2	46.5	3624	1277	1686	0.5699	727.78	134.89	862.68	108.71	69.76	127.70	556.50 d
Test avg	33.6	43.5	4406	1460	1895	0.5540	808.14	151.62	959.77	132.17	70.79	130.84	625.97
CV, %	--	--	3.8	3.7	3.7	--	3.7	3.7	3.7	3.8	--	3.8	4.1
OSL	--	--	<0.0001	<0.0001	<0.0001	--	0.0003	<0.0001	0.0002	<0.0001	--	<0.0001	0.0001
LSD (0.05)	--	--	294	94	124	--	52.03	9.94	61.95	8.83	--	8.60	44.70

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, †denotes significance at the 0.10 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.
$0.08/lb lint for stripper and $0.10/lb lint for picker.
Value for lint based on CCC loan value from bales classed

Table 5. USDA-AMS classing results of commercially ginned bales from the irrigated large plot replicated cotton systems variety by harvest method trial, Brady Mimms Farm, Acuff, TX, 2009.

Variety	Harvest Method		Color 1	Color 2	Staple	Leaf	Micronaire	Remarks	rd	+b	Length	Strength	Uniformity	Loan
			units	units	32nds	units	units	bales	units	units	inches	g/tex	%	$/lb
Americot 1532B2RF	Picker	Mean	2.2	1.0	36.9	1.6	3.9	0/12	82.4	7.3	1.15	27.7	80.3	0.5699
		Std Dev	0.39	0.00	0.29	0.67	0.12		0.50	0.14	0.01	1.52	0.65	0.0037
FiberMax 9160B2F	Picker	Mean	2.1	1.0	37.6	1.8	3.5	0/13	83.5	6.9	1.18	31.8	81.4	0.5730
		Std Dev	0.28	0.00	0.51	0.44	0.09		0.46	0.14	0.01	1.57	0.57	0.0027
FiberMax 9170B2F	Picker	Mean	1.9	1.0	37.5	1.8	3.4	0/13	84.4	6.7	1.17	30.9	80.1	0.5556
		Std Dev	0.28	0.00	0.52	0.44	0.07		0.62	0.17	0.01	1.67	0.65	0.0066
FiberMax 9180B2F	Picker	Mean	2.8	1.0	38.0	2.3	3.8	0/13	82.9	6.5	1.19	31.6	81.9	0.5687
		Std Dev	0.41	0.00	0.29	0.46	0.11		0.68	0.11	0.01	0.99	0.74	0.0042
Picker Mean			2.2	1.0	37.5	1.9	3.6	0%	83.3	6.8	1.2	30.5	81.0	0.5668
Americot 1532B2RF	Stripper	Mean	2.5	1.0	37.2	3.0	3.8	10/12	80.9	7.6	1.16	27.7	81.0	0.5438
		Std Dev	0.52	0.00	0.39	0.43	0.11		0.73	0.11	0.01	1.25	0.69	0.0123
FiberMax 9160B2F	Stripper	Mean	2.5	1.0	37.7	2.9	3.5	3/14	82.0	7.2	1.19	31.6	81.9	0.5538
		Std Dev	0.52	0.00	0.73	0.36	0.12		0.46	0.23	0.02	1.61	0.59	0.0139
FiberMax 9170B2F	Stripper	Mean	2.0	1.0	37.6	3.1	3.2	7/14	82.6	7.3	1.18	30.8	80.3	0.5250
		Std Dev	0.00	0.00	0.74	0.36	0.07		0.55	0.18	0.02	0.71	0.82	0.0191
FiberMax 9180B2F	Stripper	Mean	3.0	1.0	38.2	3.3	3.8	10/14	81.1	6.7	1.20	31.5	82.0	0.5423
		Std Dev	0.28	0.00	0.71	0.49	0.13		0.72	0.18	0.02	0.90	0.61	0.0109
Stripper Mean			2.5	1.0	37.7	3.1	3.6	56%	81.7	7.2	1.2	30.4	81.3	0.5412
Difference (Picker - Stripper)			-0.3	0.0	-0.2	-1.2	0.1	-56%	1.6	-0.3	0.0	0.1	-0.3	0.0256

Table 6. Harvest results from the replicated picker vs. stripper harvester demonstration, Eddie and Steve Verett Farm, Ralls, TX, 2009.

Harvest/ginning method	Lint turnout	Seed turnout	Bur or seed cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Harvest cost* cost	Net value	
	-------- % --------		---------- lb/acre ----------			$/lb	---------- $/acre ----------						
Picker system	35.0	50.2	2971	1040	1493	0.5679	590.51	119.41	709.92	89.14	103.99	516.80	a
Picker with stripper ginning	34.7	50.2	2956	1026	1485	0.5705	585.20	118.81	704.01	88.69	102.59	512.74	a
Stripper system	28.4	43.7	4084	1161	1785	0.5130	595.78	142.79	738.57	122.50	92.86	523.21	a
Difference (Picker system - Stripper system)	6.6	6.5	-1113	-121	-293	0.0549	-5.27	-23.39	-28.66	-33.36	11.13	-6.42	
CV, %	3.5	5.1	2.4	4.3	5.9	1.2	4.8	5.9	4.9	2.4	4.5	5.8	
OSL	0.0003	0.0139	<0.0001	0.0118	0.0063	<0.0001	0.8732	0.0062	0.3929	<0.0001	0.0242	0.8865	
LSD (0.05)	2.0	4.2	138	80	162	0.0112	NS	12.98	NS	4.15	7.73	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, NS - not significant.
Note: some columns may not add up due to rounding error.

Assumes:
$3.00/cwt ginning cost.
$160/ton for seed.
***Harvest cost = Picker at $0.10/lint lb ; Stripper at $0.08/lint lb.**

Table 7. Commercial classing results from the replicated picker vs. stripper harvester demonstration, Eddie and Steve Verett Farm, Ralls, TX, 2009.

Harvest/ginning method	Micronaire	Staple	Uniformity	Strength	Leaf	Bark	Color grade	
	units	32nds inches	%	g/tex	grade	%	color 1	color 2
Picker system	3.7	37.3	81.6	30.0	2.7	0.0	2.4	1.0
Picker with stripper ginning	3.7	37.0	81.3	30.0	2.4	0.0	2.1	1.0
Stripper system	3.2	37.0	80.6	30.4	3.0	95.8	2.5	1.0
Difference (P system - S System)	0.5	0.3	1.0	-0.4	-0.3	-95.8	-0.2	0.0
CV, %	1.1	0.8	0.4	1.0	7.6	15.1	--	--
OSL	<0.0001	0.4650	0.0064	0.1457	0.0125	<0.0001	--	--
LSD (0.05)	0.1	NS	0.5	NS	0.4	8.3	--	--

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level, NS - not significant.

Total Picker system bales classed = 38 from 17.10 acres
Total Picker with stripper ginning bales classed = 38 from 16.94 acres
Total Stripper system bales classed = 36 from 14.59 acres

Table 8. 2008-2009 Commercial yield and economic differences between picker harvested and stripper harvested cotton in the Texas High Plains.

Year/location	Gin turnout	Seed/bur cotton	Lint yield	Seed yield	Loan value	Lint + seed value	Ginning cost	Harvest cost	Net value
	%	---------- $/acre ----------			$/lb	---------- $/acre ----------			
2008									
Acuff - FM 1880B2F	5.0	-1160	-123	-199	0.0465	-3.45	-34.79	42.15	-10.82
Ralls - FM 9180B2F	5.6	-1275	-122	-311	0.0170	-67.61	-38.24	44.72	-74.08
Plains - FM 9180B2F	6.0	-1235	-156	-324	0.0491	-59.21	-37.02	19.24	-41.43
Assumed $200/ton seed, $3/cwt gin cost custom harvest $0.10 picker, $0.07 stripper									
2009									
Acuff - AM 1532B2RF, FM 9160, 9170, 9180B2F	6.4	-1187	-116	-175	0.0256	-40.75	-35.62	18.78	-23.92
Ralls - FM 9180B2F	6.6	-1113	-121	-293	0.0549	-28.66	-33.36	11.13	-6.42
Plains - AM 1532B2RF, FM 9160, 9170, 9180B2F	4.8	-1010	-96	-227	0.0287	-29.74	-30.30	14.51	-13.94
Assumed $160/ton seed, $3/cwt gin cost custom harvest $0.10 picker, $0.08 stripper									
Mean	5.7	-1163	-122	-255	0.0370	-38.24	-34.89	25.09	-28.44

Data represent picker harvested values minus stripper harvested values.

Table 9. 2008-2009 Commercial fiber quality differences between picker harvested and stripper harvested cotton in the Texas High Plains.

Year/location	Color 1	Color 2	Micronaire	Staple	Strength	Uniformity	Leaf	Bark
	---------- units ----------			32nds	g/tex	%	units	%
2008								
Acuff - FM 1880B2F	-0.3	0	0.3	0.0	-0.4	0.5	-0.6	-75.6
Ralls - FM 9180B2F	0.4	0	0.0	0.0	0.0	0.3	-0.1	-70.5
Plains - FM 9180B2F	-0.6	0	0.3	0.4	1.1	0.6	-0.2	-86.9
2009								
Acuff - AM 1532B2RF, FM 9160, 9170, 9180B2F	-0.3	0	0.1	-0.2	0.1	-0.3	-1.2	-56.0
Ralls - FM 9180B2F	-0.2	0	0.5	0.3	-0.4	1.0	-0.3	-95.8
Plains - AM 1532B2RF, FM 9160, 9170, 9180B2F	0.1	0	0.3	0.5	-0.3	0.8	-0.2	-42.0
Mean	-0.2	0.0	0.3	0.2	0.0	0.5	-0.4	-71.1

Data represent picker harvested values minus stripper harvested values.

HARVEST TIMING AND TECHNIQUES TO OPTIMIZE FIBER QUALITY – INITIAL FINDINGS

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Abstract

Production conditions typical to the Texas High Plains region can produce cotton crops with high short fiber and nep content, both of which have a detrimental impact on ring spinning performance. Since Texas now produces nearly 50% of the US cotton crop annually, it is critical that research focuses on finding ways to maximize fiber quality in order to improve the competitiveness of US cotton on the world market. The objectives of this work are to:

- Document the within-plant distribution of yield, fiber quality, and value for a well irrigated High Plains cotton crop,
- Investigate differences in fiber quality from cotton harvested with conventional equipment applied at different levels of final crop maturity, and
- Evaluate the economic feasibility of using new techniques with conventional harvesting equipment to maximize fiber quality.

Four harvesting treatments were investigated in this work: 1) picker harvest at 80% open bolls followed by a second picker harvest once all bolls were open, 2) picker harvest at 80% open bolls followed by a subsequent stripper harvest once all bolls were open, 3) conventional picking, and 4) conventional stripping. The findings of this work indicate that non-color fiber quality parameters can be improved through using a spindle picker at approximately 80% open bolls prior to defoliation. Lint value was decreased for these treatments due to poor color grades resulting from the presence of green leaf trash with high moisture content. A basic economic comparison of harvesting treatments indicated the highest net return for conventional picking but no significant difference was observed between conventional picking, conventional stripping, or the treatment using the picker at 80% open bolls prior to defoliation and then again once 100% open bolls were achieved. The harvest treatment using a picker at 80% open bolls prior to defoliation and then a brush-roll stripper at 100% open bolls after crop desiccation returned the lowest net value and was significantly lower than the conventional pick treatment.

Introduction

Cotton produced in the Texas High Plains has exhibited substantial improvements in terms of yield and fiber quality over the last decade. These improvements are due primarily to new cultivars, improved irrigation practices, and utilization of harvest-aid chemical products. However, cotton produced in the region continues to receive larger price discounts from buyers compared to cotton of equal grade and classification produced in other areas of the US. Foreign mills attribute inferior ring spinning performance of west Texas cotton to increased levels of neps and short fibers, both of which are not reported in fiber testing results from the USDA Agricultural Marketing Service using the high volume instrument (HVI) classification system.

The amount of neps and short fiber contained in ginned lint is influenced by many factors including: variety, fiber maturity, harvest-aid product and timing, harvest method, and ginning practice. Inclement weather, periods of excessive soil moisture from rainfall or irrigation, and limited heat unit accumulation (< 2500 DD60's) are production conditions experienced on the High Plains that tend to produce immature fiber with low micronaire (MIC). Cotton harvest on the High Plains is traditionally accomplished using brush-roll strippers that indiscriminately harvest seed cotton from bolls regardless of physiological maturity. Consequently, MIC for stripper harvested cotton has been shown to be reduced by 0.3 units compared to spindle picker harvested cotton of the same variety (Faulkner et al., 2009). Spindle pickers employ a selective harvesting mechanism which harvests

seed cotton only from open bolls, leaving seed cotton in less-open/less mature bolls. Moreover, aggressive ginning practices that expose seed cotton to excessive mechanical action tend to break fibers and cause fiber entanglements (i.e. neps) (Anthony et al., 1986).

Fiber quality has been shown to vary by field location, boll location on the plant, and location on the seed (Ge et al., 2008; Johnson et al., 1998; Bednarz et al., 2007; Bradow et al., 1997; Bradow and Davidonis, 2000). Naturally, fiber quality and maturity increases for older bolls found at inside fruiting positions on branches located lower on the main stem. These findings support the idea that it may be possible to develop methods or technology that harvest cotton by position resulting in fiber segregation by quality. However, market conditions continue to reward producers for total production more so than quality. To that end, new harvesting methods must maximize the amount of total production gathered from the field in order to maximize producer returns.

The goal of this work is to improve fiber quality and value of cotton produced in the Texas High Plains through new harvesting techniques utilizing conventional harvesting equipment applied at various stages of final crop maturity. The specific objectives are:

- Quantify the within-plant distribution of yield, quality, and value for a well irrigated High Plains cotton crop,
- Investigate differences in fiber quality and maturity of cotton harvested using conventional equipment (e.g. a spindle picker and a brush-roll stripper with field cleaner) at different levels of final crop maturity, and
- Evaluate the economic feasibility of using these new harvesting techniques on irrigated High Plains cotton.

Materials and Methods

One variety of cotton, FiberMax 9180 B2F, was grown in a sub-surface drip irrigated field at the USDA - ARS Plant Stress Lab in Lubbock, TX. The crop was planted May 6, 2009 on rows spaced 40 in apart with drip lines under each row. A seeding rate of 5 seed/row-ft (65,000 seed/acre) was used and subsequent plant stand counts indicated an average population of 4 plants/row-ft (55,500 plants/acre). The field was divided into sixteen plots each six rows wide and approximately 540 ft long (~0.25 acres/plot). Soil sampling was conducted in each plot prior to planting to a depth of 24 in to determine residual fertility levels. Test results indicated an average of 28.4 lb NO_3-N/acre remaining in the soil across all plots. Accounting for residual N, approximately 175 lb-N/acre was applied through the irrigation system for a yield goal of 4 bales/acre (Lemon et al., 2009). No supplemental phosphorous, potassium, or trace minerals were applied. Early season irrigation was conducted by an automated irrigation controller at a rate of 0.2 acre-in/day. However, cut-out (defined as < 4 nodes above white flower) was observed earlier than expected on July 28, 2009 due to heat stress and daily irrigation was increased to 0.31 acre-in/day to help retain fruit load. Total irrigation amount was 17.5 acre-in with an additional 5.9 acre-in from rainfall.

Harvesting treatments evaluated in the study consisted of applying a conventional six-row cotton picker (John Deere model 9996) and a conventional six-row brush-roll stripper with field cleaner (John Deere model 7445) in various sequences at different levels of final crop maturity. Treatments included:

1. Pick then Pick: Picker harvest (~80% open bolls) prior to application of crop harvest-aid chemicals followed by a second picking (~100% open bolls) after crop defoliation,
2. Pick then Strip: Picker harvest (~80% open bolls) prior to application of crop harvest-aid chemicals followed by stripper harvesting (~100% open bolls) after defoliation and desiccation,
3. Conventional Pick: Once over picker harvest (~100% open bolls) after crop defoliation, and
4. Conventional Strip: Once over stripper harvest (~100% open bolls) after crop defoliation and desiccation.

Finish 6 Pro and Ginstar were applied at 24 oz/acre and 8 oz/acre, respectively over all plots to defoliate the crop and open bolls the day after the initial picking event for the Pick then Pick and Pick then Strip treatments. The day after the second picking event for the Pick then Pick treatment and once over picking for the Conventional Pick treatment, Gramoxone Inteon was applied at 32 oz/acre to the remaining plots to desiccate the crop for stripper harvesting. The timeline of events during the 2009 harvest season is shown in table 1.

The field was sub-divided into four blocks to which each treatment was randomly applied once (table 2). The blocks, serving as replications, each contained four plots (24 rows/block). Statistical analyses were performed according to a randomized complete block design with field replicates serving as blocks. Statistical analysis was conducted using the general linear model in SAS (SAS v. 9.1, SAS Institute, Cary, NC).

Prior to machine harvest for the first and second harvest events, box mapping was conducted on 100 plants from each field replicate according to the procedure described by McCarty et al. (1975). Before the initial harvest event, 50 plants were collected from the two plots per replicate to be harvested with the picker whereas 100 plants were collected from each of the four plots to be harvested under the conventional pick treatment prior to the second harvest event. The crop had an average of 81.3% open bolls prior to the first harvest event and 100% open bolls prior to the second harvest event. The process used to box map the plant samples consisted of hand harvesting each open boll individually from the plant and placing it in a specially made box that maintained the separation of bolls by fruiting position. The box (figure 1) was constructed with internal dividers that created individual spaces indexed by main-stem node number and boll position on the fruiting branch. All bolls harvested from vegetative branches were grouped together. The number of bolls harvested from each fruiting position was recorded and seed cotton weight was measured and recorded once the boll samples were hand de-burred. These data were collected to provide information on the within-plant distribution of yield and quality for the crop at approximately 80% and 100% open bolls. Ginning of the samples by fruiting position is in progress.

Table 1. Timeline for field activities conducted during the 2009 harvest.

Date	Event	Operation
9/21/09	Box Map 1	Box mapping of plots prior to initial picker harvest, 80% open bolls
9/22/09	1st Harvest Event	Initial picker harvest for Pick then Pick and Pick then Strip treatments
9/23/09	Defoliation	Finish 6 Pro and Ginstar applied to all plots
10/14/09	Box Map 2	Box mapping of conventional picking plots, 100% open bolls
10/15/09	2nd Harvest Event	Second picker harvest for Pick then Pick treatment and once over harvest for Conventional Pick treatment
10/16/09	Desiccation	Gramoxone Inteon applied to plots to be stripper harvested
11/3/09	3rd Harvest Event	Stripper harvest for Pick then Strip and Conventional Strip treatments

Table 2. Field layout and treatment assignments.

Rep #	Treatment Assignment	Plot #
Rep 1	Treatment #3 - Conventional Pick	1
	Treatment #4 - Conventional Strip	2
	Treatment #1 - Pick then Pick	3
	Treatment #2 - Pick then Strip	4
Rep 2	Treatment #2 - Pick then Strip	5
	Treatment #4 - Conventional Strip	6
	Treatment #3 - Conventional Pick	7
	Treatment #1 - Pick then Pick	8
Rep 3	Treatment #2 - Pick then Strip	9
	Treatment #3 - Conventional Pick	10
	Treatment #1 - Pick then Pick	11
	Treatment #4 - Conventional Strip	12
Rep 4	Treatment #2 - Pick then Strip	13
	Treatment #1 - Pick then Pick	14
	Treatment #4 - Conventional Strip	15
	Treatment #3 - Conventional Pick	16

Figure 1. Box constructed to facilitate box-mapping of plant samples.

Prior to machine harvest, seed cotton samples were hand harvested for gravimetric moisture content analysis and measurements were conducted in each plot to determine the harvesting efficiency of the machine. For each harvesting efficiency measurement, two 10 ft sections of a single row separated by a 5 ft buffer were marked off at a random distance in the field. For the first 10 ft row section (as would be encountered by the machine), the two row middles were swept clear of fallen seed cotton and plant material. The seed cotton from the second 10 ft row section was hand harvested. The seed cotton left on the plants and that forced to the ground by the harvester on one side of the first 10 ft row section were gathered and weighed. Harvesting efficiency was calculated according to equation 1.

$$E_H = 100 \times \left(1 - \frac{P+G}{H}\right) \quad (1)$$

where:

E_H = harvesting efficiency for the picker or stripper (%),
P = weight of seed cotton left on plants after machine harvest (g),
G = weight of seed cotton gleaned from the ground after machine harvest (g), and
H = weight of seed cotton hand harvested from plants in second 10 ft section of row (g).

After each plot was machine harvested, the burr-cotton was weighed and a 250 lb sample was collected for ginning at the USDA – ARS Cotton Production and Processing Research Unit in Lubbock, TX. Each burr-cotton sample was weighed and processed through commercial scale ginning equipment according to the following machine sequence: suction, green boll/rock trap, steady-flow feed control, first stage tower drier, first stage inclined cleaner, first stage extractor (combination burr/stick machine), second stage tower drier, second stage inclined cleaner, second stage extractor (stick machine), extractor-feeder, 93-saw gin stand, and two stages of saw-type lint cleaning. Heated air was used in the ginning process to dry the seed cotton harvested during all three harvest events but was especially needed after harvest event one to help remove large green leaf material with high moisture content. Seed cotton samples were collected at the suction telescope and feeder apron for gravimetric moisture content analysis and fractionation analysis according to Shepherd (1972). The weight of trash removed by the seed cotton cleaning machines and both lint cleaners was recorded for one sample from each treatment during ginning and photographs were taken to document the physical makeup of the material rejected by each machine. Lint samples were collected after the second stage lint cleaner and sent for HVI and advanced fiber information system (AFIS) fiber analysis at the Fiber and Biopolymer Research Institute in Lubbock, TX. Commodity Credit Corporation (CCC) loan values for the fiber samples were calculated according to the 2009 loan chart (USDA, 2009) using HVI fiber classification results. Total lint and seed weights were recorded for each sample and used to calculate lint and seed turnout values.

Results and Discussion

Seed cotton yield distributions for field replicate four from harvest events one and two are presented in figures 2 and 3, respectively. The distribution data from harvest event one (figure 2) indicate that approximately 95% of the crop was located below main stem node 14 when the crop had 79.5% open bolls. When the crop had 100% open bolls at harvest event two, approximately 82% of the crop was located below main stem node 14. The 20% additional crop yield observed for harvest event 2 was primarily due to the opening of bolls found at node 14 and above. First position bolls accounted for 78.6 and 78.5% of the crop yield for harvest events one and two, respectively while second position bolls contained 13.2 and 14.4%, respectively. Vegetative bolls contained approximately 7.9 and 7.1% of the crop yield for harvest events one and two, respectively. Third position bolls accounted for approximately 0.3% of the crop yield at harvest event one and 0% for harvest event two. Similar data were observed for all four field replicates. Additional quality and value distribution data are being analyzed.

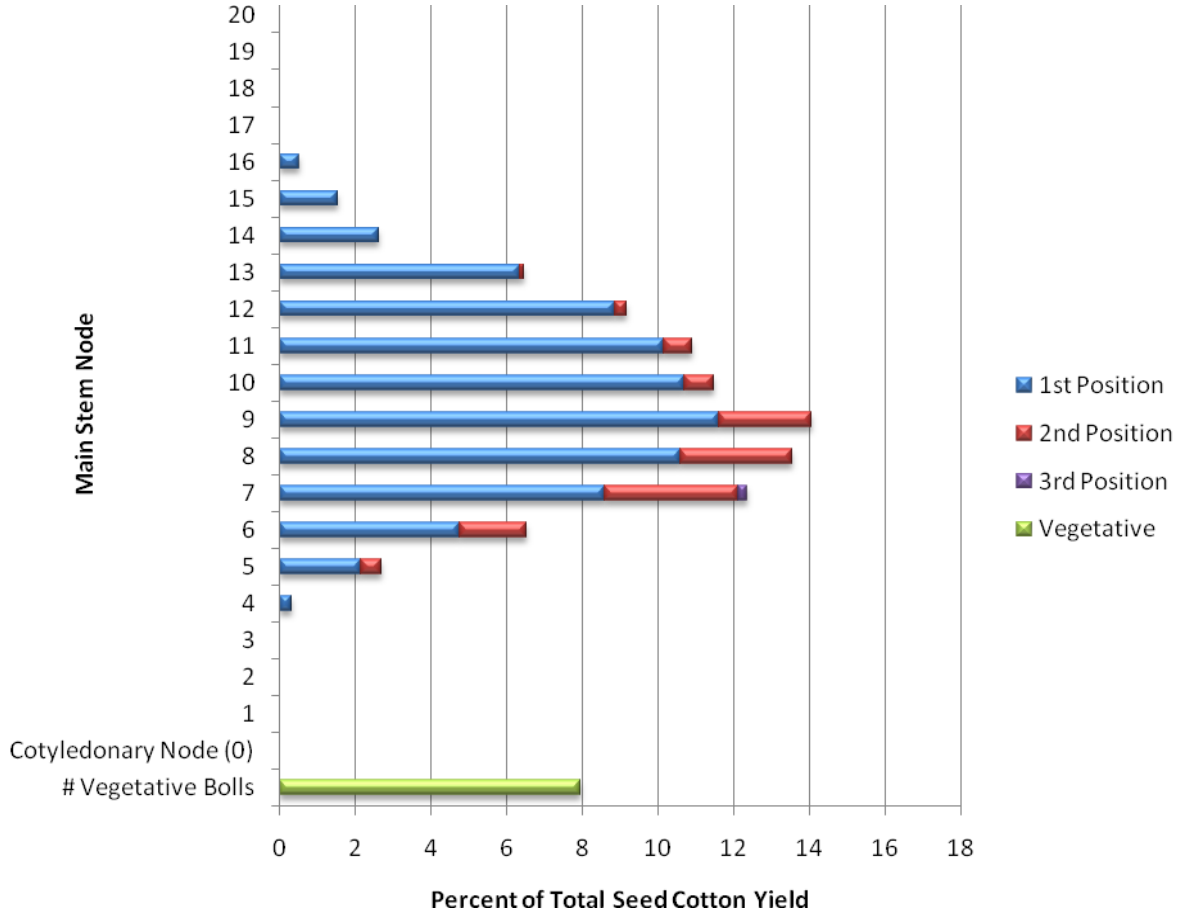

Figure 2. Harvest event 1 distribution of seed cotton yield by main stem node and fruiting position for field rep 4 (data from plots 13 and 14 combined, 79.5% open bolls).

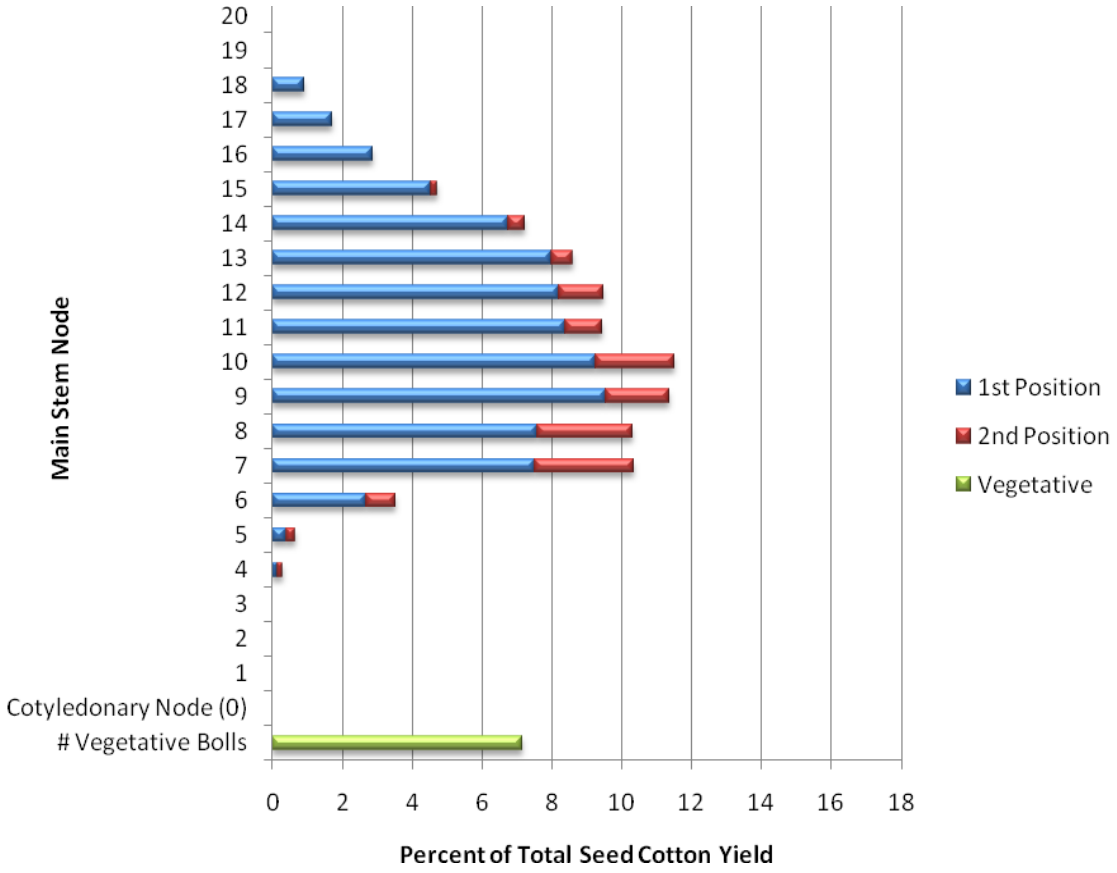

Figure 3. Harvest event 2 distribution of seed cotton yield by main stem node and fruiting position for field rep 4 (data from plot 16, 100% open bolls).

Total burr cotton, lint, and seed yields are shown by harvest treatment in table 3. Total burr cotton yields were different by harvesting treatment ($p = 0.0086$). Tukey's HSD test indicates that the pick then strip and conventional stripping treatments yielded more burr cotton per acre than the conventional picking treatment. The burr cotton yield for the pick then pick treatment was not different than any of the other treatments. These results were expected and are indicative of differences in trash level by harvesting method. No differences were observed in total lint yield or seed yield by harvest treatment and averaged 1645 lb/ac (3.4 bales/acre) and 3082 lb/acre, respectively across all treatments.

Table 3. Total burr cotton, lint, and seed yields by treatment.

	Conventional Picking	Conventional Stripping	Pick then Pick	Pick then Strip	MSD**
Burr Cotton Yield (lb/ac)	5227^{B*}	6057^{A}	5816^{AB}	6140^{A}	694.7
Lint Yield (lb/ac)	1652	1632	1685	1611	157.8
Seed Yield (lb/ac)	2957	3011	3158	3203	394.9

*Means by row with similar letters are not different according to Tukey's HSD test ($\alpha = 0.05$)
**MSD = minimum significant difference calculated according to Tukey's HSD test.

Although no differences were observed in total lint yields by harvest treatment, the lint yield for the twice over harvest treatments (pick then pick and pick then strip) varied by harvest date. Lint yields for the initial harvest (figure 4) accounted for approximately 70% of the total yield for both twice over harvest methods. This result is consistent with the percent open boll and harvest efficiency measurements considering that the crop was 80.3% open

on average at the initial harvest event and the picker had an observed harvest efficiency of 88% (table 4) (e.g. 80.3% of total yield available for harvest x 88% harvest efficiency = 70.7% of total yield harvested).

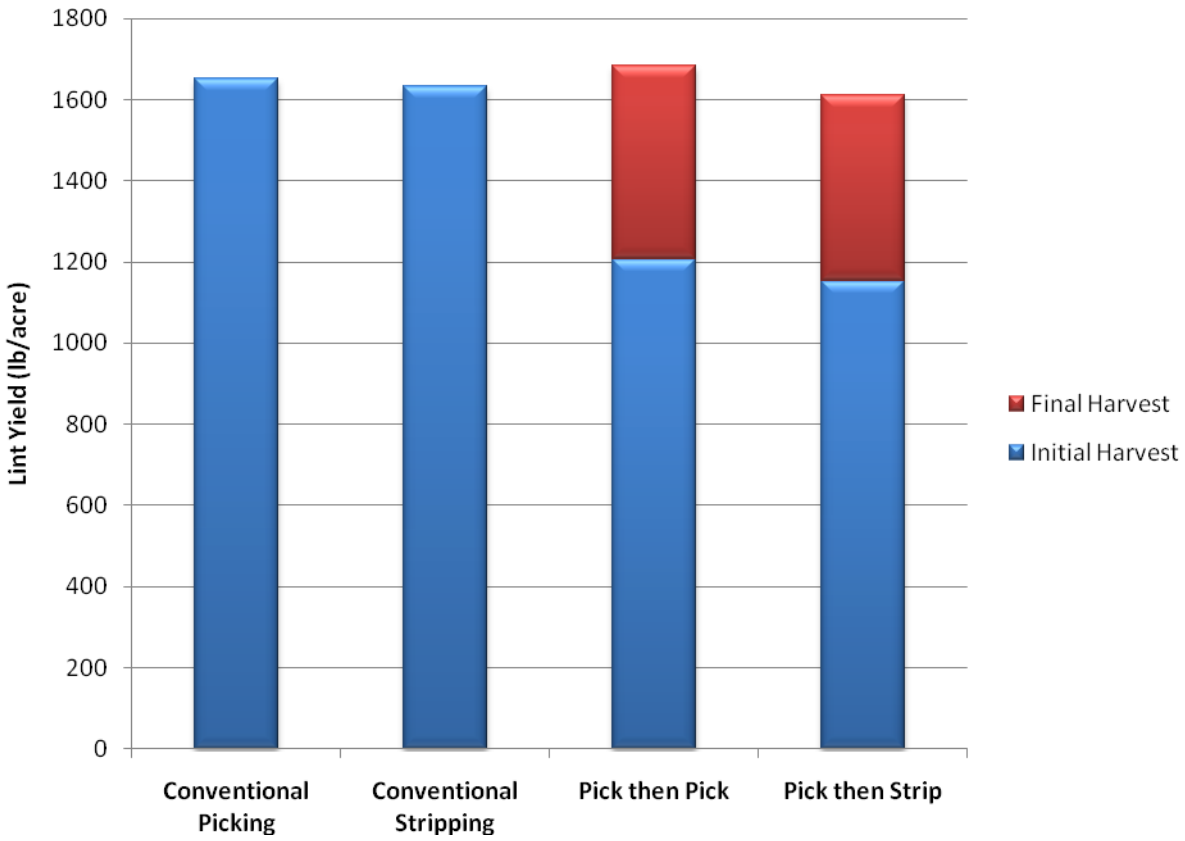

Figure 4. Lint yield by harvest treatment showing contribution by harvest date.

Table 4. Harvest efficiency measurement results and ginning performance parameters by harvest treatment.

			Pick then Pick		**Pick then Strip**			
Measurement	**Conv. Picking**	**Conv. Strip**	Initial Harvest	Final Harvest	Initial Harvest	Final Harvest	p>F	MSD**
Harvest Efficiency (%)	96.5^{A*}	99.9^{A}	88.0^{B}	89.9^{B}	88.2^{B}	97.0^{A}	<0.0001	***
Seed Cotton Cleaner Trash (lbs/bale)	157.5^{D}	388.1^{B}	290.6^{C}	181.5^{D}	306.8^{BC}	513.2^{A}	<0.0001	91.799
Lint Cleaner #1 Trash (lbs/bale)	16.2^{A}	20.1^{BC}	21.9^{CD}	17.5^{AB}	24.5^{D}	29.0^{E}	<0.0001	***
Lint Cleaner #2 Trash (lbs/bale)	6.1	6.8	6.5	6.8	7.0	7.5	0.2752	-
Seed Cotton Cleaning Rate (bales/hr-ft)	2.3^{A}	1.3^{C}	2.1^{AB}	1.8^{ABC}	2.5^{A}	1.4^{BC}	0.0002	0.7262
Ginning Rate (bales/hr)	4.8^{AB}	4.3^{BC}	4.3^{BC}	5.0^{A}	4.3^{BC}	4.0^{C}	0.0006	0.6015
Harvest Moisture Content (%)	5.42^{B}	5.52^{B}	9.41^{A}	5.32^{B}	9.19^{A}	6.09^{B}	<0.0001	1.0931
Suction Moisture Content (%)	7.48^{B}	6.67^{B}	23.95^{A}	6.78^{B}	20.06^{A}	9.09^{B}	<0.0001	6.0388
Ext. Feeder Apron Moisture Content (%)	5.83^{B}	5.52^{B}	13.77^{A}	5.35^{B}	13.24^{A}	5.37^{B}	<0.0001	1.3341
Lint Turnout (%)	31.6^{A}	27.0^{B}	28.0^{B}	31.6^{A}	27.0^{B}	24.5^{C}	<0.0001	1.6291
Seed to Lint Ratio	1.79^{C}	1.84^{BC}	1.93^{AB}	1.74^{C}	2.01^{A}	1.93^{AB}	<0.0001	0.1247

*Means by row with similar letters are not different according to Tukey's HSD test ($\alpha = 0.05$)
**MSD = minimum significant difference calculated according to Tukey's HSD test.
***Means seperation by Tukey-Kramer pairwise comparison test.

Harvest efficiency (see table 4) for both harvest events for the pick then pick treament and initial harvest for the pick then strip treatment were not different and averaged 88.7%. However, the harvesting efficiency of the picker was significantly higher for the conventional picking treatment (96.5%) than the other treatments where the picker was used. The harvesting efficiency of the picker was likely hindered during harvest event one due to the thick green condition of the crop. Harvest efficiency for the final harvest event for the pick then pick treatment was 89.9% and was lower than the conventional pick treatment. Low yield (478 lb/acre average) and tight boll conformations during the final harvest of the pick then pick treatment explain the low harvesting efficiency of the picker. The stripper harvesting efficiency was 99.9% for the conventional strip treatment but reduced to 97% for the final harvest event of the pick then strip treatment.

Differences by harvest treatment were observed for the seed cotton cleaner trash ($p < 0.0001$) and lint cleaner #1 trash ($p < 0.0001$). However, no differences by harvest method were observed in the lint cleaner #2 data ($p = 0.2752$). Excessive seed cotton cleaner trash (lb/bale) was observed for the initial harvest of the pick then pick and pick then strip treatments. This result was not expected and translated into reduced lint turnout values for the initial picker harvest for these two treatments. Further investigation of the harvest, suction, and extractor feeder apron moisture content data indicates a substantial increase in moisture content for the initial harvest events for the twice over harvest treatments. We believe that excessive moisture (20 – 24% moisture content at the suction telescope, table 4) contained in the trash in the ginning samples is the cause of the high seed cotton cleaner trash weights and low lint turnout values. Seed cotton cleaning rates were different by harvest treatment ($p = 0.0002$) as a consequence of trash level but were held within the recommended cleaning rate for the machinery used (< 2.5 bales/hr-ft). Ginning rate was also different by harvesting treatment ($p = 0.0006$). All ginning rates were within manufacturer recommended rates (5-6 bales/hr) and the small variation in ginning rate among treatments is not expected to influence fiber quality results.

HVI fiber quality analysis results for lint samples collected after two stages of lint cleaning are presented in table 5. MIC was different by harvest treatment ($p < 0.0001$) and was significantly higher for earlier harvest events for the twice over harvest treatments. The initial picker harvest for the pick then pick and pick then strip treatments had the highest MIC values of 4.5 and 4.4, respectively, since the machine was harvesting naturally opened cotton prior to the application of defoliant and boll opening chemicals. MIC was significantly higher for samples from the initial picker harvest event of the twice over harvest treatments than any of the stripper harvested samples. MIC decreased to 4.3 for the conventional pick treatment but was not different than the MIC for the conventional strip (4.2), final harvest of pick then pick (4.12), or initial harvest of the pick then strip treatments. Differences by treatment were observed for length ($p = 0.0043$) and uniformity ($p = 0.0012$) and favored picking. No differences were observed by treatment for the strength data. Differences were observed in the elongation data by treatment ($p = 0.0367$) but the magnitude of the differences is likely of little practical significance. Leaf grade differences by treatment were significant ($p = 0.0006$) but Tukey's HSD test inicated that only the final harvest event for the pick then strip treatment was higher (leaf grade = 2.3) than the other treatments (leaf grade range 1.0 – 1.3). Reflectance (Rd) values differed by harvest treatment ($p < 0.0001$) and were highest for the conventional pick (82.03%), conventional strip (81.55%), and pick then pick – final harvest treatments (81.10%) which were not different. Rd was lowest for the pick then pick (74.75%) and pick then strip (75.45%) initial harvest treatments due to the presence of high moisture content green leaf trash. Rd for the final harvest of the pick then pick treatment was intermediate to the other treatments at 78.95%. Plus b (yellowness) values trended similarly to the Rd values due to the presence of high moisture content trash. Yellowness values were highest for the initial picker harvest events of the pick then pick (10.13%) and pick then strip (10.05%) treatments. Yellowness decreased significantly from the first to the second harvest event and was 7.48% and 7.43% for the conventional pick and final harvest for the pick then pick treatments, respectively. The stripper harvested treatments occuring during the third harvest event had the lowest +b values and were both 6.65%. The Rd and +b values for the initial harvest events for the twice over harvest treatments translated into poorer predominate color grades than other treatments and resulted in decreased lint loan values. Loan values were different by harvest treatment ($p < 0.0001$) and means separation tests indicated that the mean loan values for samples harvested during the first harvest event and final harvest for the pick then strip treatments were significantly lower than samples collected from all other treatments.

Table 5. HVI fiber quality anlaysis results for lint samples collected after two stages of saw-type lint cleaning.

	Conventional Picking	Conventional Stripping	Pick then Pick		Pick then Strip			
HVI Parameter	-	-	Initial Harvest	Final Harvest	Initial Harvest	Final Harvest	p>F	MSD*
Predominate Color Grade	21	31	32	31	32 & 22	41		
MIC	4.3 ^{BC}	4.2 ^{CD}	4.5 ^{A}	4.12 ^{CD}	4.4 ^{AB}	4.05 ^{D}	<0.0001	0.1935
Length (in)	1.205 ^{A}	1.175 ^{B}	1.203 ^{A}	1.193 ^{AB}	1.205 ^{A}	1.180 ^{AB}	0.0043	0.0262
Uniformity (%)	82.8 ^{A}	81.6 ^{CD}	82.7 ^{AB}	82.0 ^{ABC}	82.9 ^{A}	81.7 ^{CB}	0.0012	1.0092
Strength (g/tex)	32.5	31.6	31.3	32.1	32.0	31.8	0.0605	-
Elongation (%)	6.3 ^{AB}	6.6 ^{A}	6.3 ^{AB}	6.2 ^{B}	6.3 ^{AB}	6.4 ^{AB}	0.0367	0.32
Leaf Grade	1.0 ^{B}	1.3 ^{B}	1.3 ^{B}	1.0 ^{B}	1.0 ^{B}	2.3 ^{A}	0.0006	0.7945
Rd (%)	82.03 ^{A}	81.55 ^{A}	74.75 ^{C}	81.10 ^{A}	75.45 ^{C}	78.95 ^{B}	<0.0001	1.2961
+b (%)	7.48 ^{B}	6.65 ^{C}	10.13 ^{A}	7.43 ^{B}	10.05 ^{A}	6.65 ^{C}	<0.0001	0.3865
Loan Value ($/lb)	0.5746 ^{A}	0.5683 ^{A}	0.5365 ^{B}	0.5711 ^{A}	0.5458 ^{B}	0.5503 ^{B}	<0.0001	0.0158

*MSD calculated according to Tukey's HSD test. Means in the same row followed by similar letters are not different at the 0.05 level of significance.

The results of AFIS fiber quality analysis for lint samples collected after two stages of saw-type lint cleaning are presented in table 6. Nep size was different by harvest method ($p = 0.0054$) and was generally smaller for picked samples and earlier harvest events. Nep content was different by harvest method ($p = 0.0005$) and showed a 22% average decrease for picker harvested samples compared to stripper harvested samples. Nep content was also lower for the initial harvest event for the pick then pick treatment than the final harvest event. Mean length by weight [l(w)] was different by harvest method ($p < 0.0001$) and was longer for the initial harvest of the twice over treatments and the conventional pick treatment. Harvesting treatment differences for both length by weight coefficient of variation [l(w) CV] ($p < 0.0001$) and upper quartile length (UQL) by weight ($p < 0.0001$) were observed and tended to favor the picker harvested samples from the first harvest event and the conventional pick treatment. Short fiber content by weight [SFC(w)] was lowest for the picker harvested samples from the first harvest event and the conventional pick treatment. SFC(w) was reduced by approximatley 25% on average for picked compared to stripped samples. Differences were observed by treatment for mean length by number [l(n)] ($p < 0.0001$), l(n) CV ($p < 0.0001$), and SFC(n) ($p < 0.0001$) and trends in the data followed that of the weight based length measurements. Differences by harvest method were observed in the total foreign material content ($p = 0.0001$) and dust content data ($p = 0.0001$). Trends for these two parameters were identical with lower foreign levels generally observed in picker harvested samples. Although not significantly different, the total foreign material and dust content levels for the initial harvest of the pick then pick treatment are considerably higher than those of samples from the initial harvest event of the pick then strip treatment. There is no currently known logical reason for this difference as it seems to be an anomoly in the data. No differences were observed by harvest treatment in the trash size data. Significant differences were observed by harvest method for the visible foreign material (VFM) data ($p = 0.001$). Although no differences were observed in the seed coat nep size (SCN size) data, SCN content was different by harvest treatment ($p = 0.0031$). Harvest date had a significant effect on the SCN content data as the amount of SCN approximately doubled between the initial and final harvest dates for the pick then pick treatment (initial harvest = 7.8 /g, final harvest = 15.3 /g). Fineness (Fine), immature fiber content (IFC), and maturity ratio were not different by harvest treatment and averaged 163.4 mTex, 7.66%, and 0.87, respectively. The result for fineness was expected as fineness is a genetic trait and only one variety (FiberMax 9180 B2F) was used. However, IFC and maturity ratio indicate that the fiber produced was quite mature.

Table 6. AFIS fiber quality analysis results for lint samples collected after two stages of saw-type lint cleaning.

AFIS Parameter	Conventional Picking	Conventional Stripping	Pick then Pick		Pick then Strip		p>F	MSD*
			Initial Harvest	Final Harvest	Initial Harvest	Final Harvest		
Nep size (um)	678 ^{AB}	691 ^{A}	673 ^{AB}	694 ^{A}	663 ^{B}	689 ^{A}	0.0054	24.241
Neps per Gm	315 ^{BC}	377 ^{AB}	293 ^{C}	375 ^{AB}	306 ^{BC}	415 ^{A}	0.0005	79.673
L(w) [in]	1.038 ^{A}	0.980 ^{B}	1.053 ^{A}	1.000 ^{B}	1.048 ^{A}	0.973 ^{B}	<0.0001	0.0363
L(w) CV [%]	34.2 ^{B}	37.5 ^{A}	33.4 ^{B}	36.6 ^{A}	33.4 ^{B}	37.5 ^{A}	<0.0001	1.7722
UQL (w) [in]	1.270 ^{AB}	1.225 ^{C}	1.280 ^{A}	1.245 ^{BC}	1.275 ^{AB}	1.218 ^{C}	<0.0001	0.0317
SFC (w) [%]	7.98 ^{B}	10.80 ^{A}	7.23 ^{B}	9.78 ^{A}	7.33 ^{B}	11.05 ^{A}	<0.0001	1.6308
L(n) [in]	0.818 ^{A}	0.738 ^{B}	0.840 ^{A}	0.765 ^{B}	0.835 ^{A}	0.730 ^{B}	<0.0001	0.0466
L(n) CV [%]	52.15 ^{B}	56.98 ^{A}	50.25 ^{B}	55.88 ^{A}	50.18 ^{B}	57.65 ^{A}	<0.0001	2.8481
SFC (n) [%]	26.15 ^{B}	32.25 ^{A}	24.13 ^{B}	30.45 ^{A}	24.23 ^{B}	33.00 ^{A}	<0.0001	3.5343
L5% (n) [in]	1.435 ^{A}	1.390 ^{B}	1.445 ^{A}	1.415 ^{AB}	1.443 ^{A}	1.385 ^{B}	<0.0001	0.0312
Total Cnt/g	172 ^{C}	273 ^{BC}	281 ^{ABC}	299 ^{AB}	178 ^{BC}	402 ^{A}	0.0001	121.84
Trash Size [um]	348	333	323	345	339	354	0.0875	-
Dust Cnt/g	141 ^{C}	224 ^{BC}	233 ^{ABC}	243 ^{AB}	147 ^{BC}	326 ^{A}	0.0001	99.871
Trash Cnt/g	31 ^{B}	49 ^{B}	48 ^{B}	56 ^{AB}	31 ^{B}	76 ^{A}	0.0003	26.388
VFM [%]	0.68 ^{B}	0.77 ^{B}	0.91 ^{AB}	1.07 ^{AB}	0.63 ^{B}	1.38 ^{A}	0.001	0.4849
SCN Size (um)	1077	1102	1228	1134	1099	1010	0.3725	-
SCN (Cnt/g)	9.3 ^{ABC}	9.0 ^{ABC}	7.8 ^{C}	15.3 ^{A}	8.3 ^{BC}	14.3 ^{AB}	0.0031	6.2616
Fine [mTex]	164.5	161.8	165.3	162.8	164.5	161.5	0.0547	-
IFC [%]	7.33	8.10	7.23	7.83	7.43	8.08	0.0212	0.9262
Mat Ratio	0.88	0.86	0.87	0.87	0.87	0.86	0.0649	-

*MSD calculated according to Tukey's HSD test.
Means in the same row followed by the same letter are not significantly different at the 0.05 level of significance.

A basic economic comparison (table 7) of the harvesting treatments was developed based on lint and seed revenue as well as harvest-aid application, harvesting, and ginning costs. Lint value per acre, calculated from lint yield and loan value (table 5), was not different by harvest method ($p = 0.1851$) and averaged $919.60/acre across treatments. Similarly, seed value was not different ($p = 0.2464$) by treatment and averaged $246.58/acre. Cotton seed was valued at $160 per ton for this comparison. Total revenue was not different by harvest treatment ($p = 0.6438$) and averaged $1166.18/ac. Harvest aid costs were different since additional chemicals were applied to stripper harvested plots to desiccate the crop. Harvest aid costs for the conventional pick and pick then pick treatments were $29/acre (Finish Pro @ 24 oz/acre: $11.81/ac + Ginstar @ 8 oz/acre: $12.19/acre + $5/acre application cost) while the conventional strip and pick then strip treatments incurred an additional $14.89 /acre for desiccant application (Gramoxone Inteon @ 32 oz/acre: $9.89/acre + $5.00/acre application cost). Harvesting costs were calculated using $0.10 /lint lb for picked cotton and $0.08 /lint lb for stripped cotton and differences were observed by harvest treatment ($p = 0.004$). Harvest cost for the conventional strip ($130.56/acre) treatment was lower than all other treatments. Ginning costs were calculated using $3/cwt incoming seed cotton weight and differences were observed by harvest treatment ($p = 0.0086$). Ginning costs were not different for the conventional strip ($181.70/acre) and pick then strip ($184.20/acre) treatments but were higher than the conventional pick treatment ginning cost ($156.80/acre). Ginning cost for the pick then pick treatment was not different than any other treatment ($174.47/acre). Total harvest and ginning cost was different by harvest method ($p = 0.0344$) and ranged from $342.96/acre for the conventional pick treatment to $389.16/acre for the pick then strip treatment. Total harvest and ginning costs for the conventional strip ($356.15/acre) and pick then pick ($371.97/acre) treatments were not different than the conventional pick or pick then strip treatments, which were different. Net income was highest for the conventional picking treatment ($842.66/acre) which was not different than the conventional strip ($812.11/acre) or pick then pick ($801.36/acre) treatments. The pick then strip treatment had the lowest net income of $748.36/acre and was only significantly different than the conventional pick treatment.

Table 7. Basic economic comparison of harvest treatments.

	Conventional Picking		Conventional Stripping		Pick then Pick		Pick then Strip		p>F	MSD
Income										
Lint Value ($/ac)	$ 949.05		$ 927.40		$ 920.69		$ 881.27		0.1851	-
Seed Value ($/ac)	$ 236.57		$ 240.85		$ 252.63		$ 256.25		0.2464	-
Total Revenue ($/ac)	$ 1,185.62		$ 1,168.26		$ 1,173.32		$ 1,137.52		0.6438	-
Expenses										
Harvest Aids ($/ac)	$ 29.00	A	$ 43.89	B	$ 29.00	A	$ 43.89	B	<0.0001	$ -
Harvesting ($/ac)	$ 157.15	A	$ 130.56	B	$ 168.50	A	$ 161.07	A	0.004	$ 25.09
Ginning ($/ac)	$ 156.80	B	$ 181.70	A	$ 174.47	AB	$ 184.20	A	0.0086	$ 20.83
Total Harvest & Ginning ($/ac)	$ 342.96	B	$ 356.15	AB	$ 371.97	AB	$ 389.16	A	0.0344	$ 41.88
Net Income ($/ac)	**$ 842.66**	A	**$ 812.11**	AB	**$ 801.36**	AB	**$ 748.36**	B	0.0242	$ 77.54

Summary

One variety of cotton (FiberMax 9180 B2F) was produced on a drip irrigated field in Lubbock, TX and harvested using conventional harvesting equipment applied at different levels of final crop maturity defined by percent open bolls. Box mapping was conducted to document the within-plant distribution of yield and fiber quality for the crop at 80% and 100% open bolls. Seed cotton yield distribution data indicates that approximately 95% of the crop yield is located below main stem node 14 at 80% open bolls but decreases to approximately 82% at 100% open bolls. The majority of the crop yield is located in first position bolls. We are in the process of developing distributions for fiber quality and lint value based on HVI and AFIS analyses of ginned lint samples.

Lint yield for the crop was not observed to be different between harvest treatments. The harvesting efficiency of the spindle type cotton picker was reduced to approximately 90% for initial harvest events when the crop was still green prior to defoliation. After defoliation, harvesting efficiency for the picker increased substantially to over 96% for the conventional picking treatment while low yields and tight boll conformations kept picking efficiency low for the final harvest event of the pick then pick treatment. Harvesting efficiency for the stripper harvester remained high (~97 - 99%) as seen in previous work.

HVI fiber analysis indicated differences by harvest treatment for most parameters except strength and tended to favor picking and earlier harvest events. MIC values ranged from 4.1 to 4.5 indicating that the fiber was mature but was highest for the initial harvest event using the spindle picker. However, lint loan value for the initial harvest event for the twice over harvest treatments using the picker was lower than other treatments due to poor color grades caused by the presence of green leaf trash with high moisture content. AFIS fiber analyses indicated improvements in terms of nep content and short fiber content for picked cotton harvested earlier.

Economic comparison of the harvest treatments under the conditions experienced during the 2009 growing season with regard to net value per acre indicates that the conventional pick treatment was not significantly different than the conventional strip or pick then pick treatments but returned more per acre than the pick then strip treatment. These findings were based on agronomic comparisons assuming equal production costs up to the time of harvest, consistent harvest costs regardless of yield (i.e. cost to pick remains at $0.10/lint lb for 1 bale/acre or 3 bale/acre yield), and there is no price premium above CCC loan value for high quality cotton.

The findings presented in this manuscript are representative of a crop with relatively high fiber maturity. Additional work planned for the 2010 crop year will focus on documenting yield and fiber quality distributions as well as harvest treatment effects on fiber quality and net return for a crop with higher yield, lower average MIC, and wider fiber maturity distribution.

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Disclaimer

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Additional Replicated Irrigated Large Plot Demonstrations

AgriLIFE EXTENSION
Texas A&M System

Replicated Sub-Surface Drip Irrigated Cotton Variety Demonstration, Ralls, TX - 2009

Cooperator: David Crump

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CEA-ANR Crosby County, EA-IPM Crosby/Floyd Counties,
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Crosby County

Summary: Significant differences were observed for all yield and economic parameters measured with exception of lint loan value. Lint turnout ranged from a low of 30.2% to a high of 34.5% for FiberMax 9160B2F and All-Tex Epic RF, respectively. Lint yields varied with a low of 1121 lb/acre (FiberMax 9160B2F) and a high of 1442 lb/acre (Deltapine 0912B2RF). Lint loan values averaged $0.5456/lb and ranged from a low of $0.4912/lb (Croplan Genetics 3220B2RF) to a high of $0.5668/lb (NexGen 3348B2RF). Net value/acre among varieties ranged from a high of $781.69 (Deltapine 0912B2RF) to a low of $563.10 (FiberMax 9160B2F), a difference of $218.59. Fiber quality data indicated significant differences among varieties for most parameters measured. Micronaire values ranged from a low of 3.0 for FiberMax 9160B2F to a high of 4.0 for Deltapine 0912B2RF. Staple averaged 37.0 across all varieties with a low of 35.6 for Croplan Genetics 3220B2RF and a high of 38.0 for FiberMax 9160B2F. The highest percent uniformity was observed for NexGen 3348B2RF (84.2%) and Croplan Genetics 3220B2RF had the lowest (79.5%). Strength values averaged 28.6 g/tex with a high of 30.3 g/tex for NexGen 3348B2RF and a low of 27.0 g/tex for Croplan Genetics 3220B2RF. Color grades of mostly 11 and 21 were observed at this location. 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 sub-surface drip irrigated production in the Texas High Plains.

Materials and Methods:

Varieties: All-Tex Epic RF, Croplan Genetics 3220B2RF, Deltapine 0912B2RF, Dyna-Gro 2570B2RF, FiberMax 9160B2F, NexGen 3348B2RF, PhytoGen 375WRF, Stoneville 4288B2F

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3.7 seeds/row-ft in 40-inch row spacing (John Deere 1700 vacuum planter)

Plot size: 8 rows by length of field (~1626 ft long)

Planting date: 13-May (lost to hail event), replant 2-June

Weed management: Plots were sprayed with trifluralin at 1 qt/acre preplant incorporated and 3 applications of Roundup PowerMax at 22.0 oz/acre rate with ammonium sulfate on 20-May, 17-June and 30-July.

Irrigation: The field had a 4 gpm/acre irrigation capacity. This provided for 0.21 acre-inches/day. From June to end of August, a total of approximately 19.3 inches of irrigation were applied.

Rainfall: Based on the nearest Texas Tech University - West Texas Mesonet station at Ralls, rainfall amounts were:

April:	0.90"	July:	3.01"
May:	1.31"	August:	0.18"
June:	2.96"	September:	2.81"

Total rainfall: 11.17"

Insecticides: No insecticides were applied by the producer at this site. This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.

Fertilizer management: 60 lbs N/acre was applied using composted manure in March, and 50 lbs N/acre using 32-0-0 was applied via fertigation during the growing season.

Harvest aids: No harvest aids were applied at this location.

Harvest: Plots were harvested on 4-November using a commercial John Deere 7455 with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to record individual plot weights. Plot weights were subsequently converted to lb/acre basis.

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 (3.7 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 among varieties for plant population on 12-June (Table 1). Plant stands averaged 38,779 and ranged from a high of 43,037 plants/acre for PhytoGen 375WRF to a low of 34,674 for Dyna-Gro 2570B2RF. Nodes above white flower (NAWF) counts were taken on a weekly basis beginning 3-August to 25-August. Significant differences were observed among varieties for all NAWF observation dates except for the 10-August. On 3-August, NAWF values ranged from a low of 6.0 for Stoneville 4288B2F to a high of 7.0 for All-Tex Epic RF. The test average on 10-August was 6.2 and ranged from 5.9 (NexGen 3348B2RF and Stoneville 4288B2F) to a high of 6.6 (All-Tex Epic RF). By 17-August two varieties, Stoneville 4288B2F and NexGen 3348B2RF, had reached cutout (NAWF=5) and values ranged from a high of 5.8 for All-Tex Epic RF to a low of 4.8 for NexGen 3348B2RF. On 25-August, values ranged from a high of 4.0 (All-Tex Epic RF) to a low of 2.8 (Stoneville 4288B2F) and all varieties had reached cutout.

Significant differences were observed for all yield and economic parameters measured with exception of lint loan value (Table 2). Lint turnout ranged from a low of 30.2% to a high of 34.5% for FiberMax 9160B2F and All-Tex Epic RF, respectively. Bur cotton yields averaged 3975 lb/acre with a high of 4219 lb/acre for Deltapine 0912B2RF, to a low of 3711 lb/acre for FiberMax 9160B2F. Lint yields varied with a low of 1121 lb/acre (FiberMax 9160B2F) and a high of 1442 lb/acre (Deltapine 0912B2RF). Average lint loan values averaged $0.5456/lb and ranged from a low of $0.4912/lb (Croplan Genetics 3220B2RF) to a high of $0.5668/lb (NexGen 3348B2RF). After adding lint and seed value, total value/acre for varieties ranged from a low of $738.25 for FiberMax 9160B2F to a high of $971.59 for Deltapine 0912B2RF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $781.69 (Deltapine 0912B2RF) to a low of $563.10 (FiberMax 9160B2F), a difference of $218.59.

Fiber quality data indicated significant differences among varieties for most parameters measured (Table 3.) Micronaire values ranged from a low of 3.0 for FiberMax 9160B2F to a high of 4.0 for Deltapine 0912B2RF. Staple length averaged 37.0 across all varieties with a low of 35.6 for Croplan Genetics 3220B2RF and a high of 38.0 for FiberMax 9160B2F. The highest percent uniformity was observed for NexGen 3348B2RF (84.2%) and Croplan Genetics 3220B2RF had the lowest (79.5%). Strength values averaged 28.6 g/tex with a high of 30.3 g/tex for NexGen 3348B2RF and a low of 27.0 g/tex for Croplan Genetics 3220B2RF. Elongation averaged 11.0% and ranged from a high of 11.9 for All-Tex Epic RF to a low of 9.6 for FiberMax 9160B2F. No significant differences were observed among varieties for leaf (2.6 avg), Rd or reflectance (81.1 avg), or +b or yellowness (8.9 avg). Color grades of mostly 11 and 21 were observed at this location.

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 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:

Appreciation is expressed to David Crump for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

Disclaimer Clause:

Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Table 1. Plant stand and NAWF results from the replicated irrigated RACE variety demonstration, David Crump Farm, Ralls, TX, 2009.

	Plant Population 12-Jun		Nodes Above White Flower (NAWF) for Week of			
Entry	plants/row ft	plants/acre	3-Aug	10-Aug	17-Aug	25-Aug
All-Tex Epic RF	3.0	39,988	7.0	6.6	5.8	4.0
Croplan Genetics 3220B2RF	3.1	40,511	6.3	6.4	5.3	3.5
Deltapine 0912B2RF	3.0	39,030	6.4	6.2	5.4	3.4
Dyna-Gro 2570B2RF	2.6	34,674	6.6	6.1	5.2	3.4
FiberMax 9160B2F	3.0	38,943	6.8	6.0	5.2	3.5
NexGen 3348B2RF	2.7	35,283	6.1	5.9	4.8	3.4
PhytoGen 375WRF	3.3	43,037	6.7	6.3	5.6	3.6
Stoneville 4288B2F	3.0	38,768	6.0	5.9	4.9	2.8
Test average	3.0	38,779	6.5	6.2	5.3	3.4
CV, %	6.5	6.1	3.7	6.2	4.3	7.9
OSL	0.0187	0.0131	0.0019	0.2785	0.0011	0.0115
LSD 0.05	0.3	4,124	0.4	NS	0.4	0.5

NAWF numbers represent an average of 10 plants per rep per variety for a total of 30 plants per variety.
CV - coefficient of variation, percent.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level, NS - not significant.

Table 2. Harvest results from the replicated irrigated RACE variety demonstration, David Crump Farm, Ralls, 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 ----------						
Deltapine 0912B2RF	34.2	50.6	4219	1442	2137	0.5552	800.64	170.95	971.59	126.58	63.32	781.69	a
Dyna-Gro 2570B2RF	34.0	51.1	3943	1343	2017	0.5645	757.89	161.35	919.24	118.30	62.17	738.76	ab
All-Tex Epic RF	34.5	49.3	3920	1351	1931	0.5565	751.96	154.45	906.40	117.60	52.15	736.66	ab
Stoneville 4288B2F	31.4	52.8	4125	1296	2179	0.5615	727.90	174.35	902.25	123.75	63.82	714.68	b
NexGen 3348B2RF	31.7	50.0	3982	1262	1992	0.5668	715.57	159.35	874.92	119.47	62.59	692.86	bc
PhytoGen 375WRF	32.2	49.7	3918	1260	1947	0.5442	685.89	155.76	841.65	117.54	62.15	661.96	c
Croplan Genetics 3220B2RF	31.9	51.5	3982	1271	2053	0.4912	624.44	164.21	788.64	119.45	61.96	607.24	d
FiberMax 9160B2F	30.2	50.3	3711	1121	1867	0.5252	588.91	149.33	738.25	111.33	63.82	563.10	d
Test average	32.5	50.7	3975	1293	2015	0.5456	706.65	161.22	867.87	119.25	61.50	687.12	
CV, %	3.8	2.2	3.7	3.8	3.7	6.4	3.9	3.7	3.9	3.7	--	4.2	
OSL	0.0075	0.0350	0.0317	0.0001	0.0023	0.2093	<0.0001	0.0022	<0.0001	0.0318	--	<0.0001	
LSD	2.2	2.0	257	87	131	NS	48.19	10.43	58.62	7.72	--	50.91	

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 3. HVI fiber property results from the replicated irrigated RACE variety demonstration, David Crump Farm, Ralls, 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
All-Tex Epic RF	3.5	36.7	82.1	27.7	11.9	2.0	81.3	9.3	1.0	1.0
Croplan Genetics 3220B2RF	3.1	35.6	79.5	27.0	10.6	2.7	80.6	8.6	1.7	1.0
Dyna-Gro 2570B2RF	3.7	36.7	82.0	28.3	11.7	1.3	81.8	9.3	1.0	1.0
Deltapine 0912B2RF	4.0	36.7	82.7	29.2	11.3	4.0	80.2	9.2	1.7	1.0
FiberMax 9160B2F	3.0	38.0	83.0	29.8	9.6	2.7	82.4	8.5	1.0	1.0
NexGen 3348B2RF	3.7	37.6	84.2	30.3	10.8	2.7	80.5	8.4	2.3	1.0
PhytoGen 375WRF	3.4	36.8	81.5	27.3	10.7	2.3	82.1	8.8	1.0	1.0
Stoneville 4288B2F	3.9	37.9	82.8	29.4	10.9	3.3	79.5	9.1	1.7	1.0
Test average	3.5	37.0	82.2	28.6	11.0	2.6	81.1	8.9	1.4	1.0
CV, %	7.4	2.2	1.8	3.0	5.5	45.2	1.5	5.1	--	--
OSL	0.0025	0.0470	0.0573†	0.0023	0.0104	0.2874	0.1318	0.1196	--	--
LSD	0.5	1.4	2.1	1.5	1.1	NS	NS	NS	--	--

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.

AgriLIFE EXTENSION
Texas A&M System

Replicated Sub-Surface Drip Irrigated Cotton Variety Demonstration, Lockney, TX - 2009

Cooperator: Boyd Jackson

J. D. Ragland, Randy Boman, Mark Kelley and Chris Ashbrook
CEA-ANR Floyd County, Extension Agronomist - Cotton, Extension Program Specialist II - Cotton, and Extension Assistant - Cotton

Floyd County

Summary: **This site experienced delayed emergence and was damaged by an early June hail event. Also, some Verticillium wilt pressure was observed**. Significant differences were observed for all yield and most fiber quality parameters measured. Lint turnout ranged from a low of 25.7% to a high of 28.8% for Stoneville 4288B2F and Deltapine 0912B2RF, respectively. Lint yields varied with a low of 955 lb/acre (All-Tex Epic RF) and a high of 1188 lb/acre (FiberMax 9180B2F). Average lint loan values ranged from a low of $0.4012/lb (Deltapine 0912B2RF) to a high of $0.4747/lb (FiberMax 9180B2F). When subtracting ginning and seed and technology fee costs, the net value/acre among varieties ranged from a high of $526.61 (FiberMax 9180B2F) to a low of $378.02 (Deltapine 0912B2RF), a difference of $148.60. Micronaire values ranged from a low of 2.2 for All-Tex Epic RF, Dyna-Gro 2570B2RF and FiberMax 9160B2F to a high of 2.5 for NexGen 3348B2RF and FiberMax 9180B2F. Staple averaged 35.8 across all varieties with a low of 34.2 for Deltapine 0912B2RF and a high of 38.5 for FiberMax 9160B2F. The highest percent uniformity was observed for FiberMax 9160B2F (81.8%) and Deltapine 0912B2RF had the lowest (78.6%). Strength values averaged 27.8 g/tex with a high of 31.3 g/tex for FiberMax 9180B2F, and a low of 25.5 g/tex for Deltapine 0912B2RF. Leaf grades averaged 3.6 at this location. Values for reflectance (Rd) and yellowness (+b) averaged 83.0 and 8.7, respectively. Color grades of 11 were observed across all varieties. 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 sub-surface drip irrigated production in the Texas High Plains.

Materials and Methods:

Varieties: All-Tex Epic RF, Croplan Genetics 3220B2RF, Deltapine 0912B2RF, Dyna-Gro 2570B2RF, FiberMax 9160B2F, FiberMax 9180B2F, NexGen 3348B2RF, PhytoGen 375WRF, Stoneville 4288B2F

Experimental design: Randomized complete block with 3 replications

Seeding rate: 4.0 seeds/row-ft in 40-inch row spacing (International Harvester 1200 vacuum planter)

Plot size: 8 rows by length of field (~1704 ft long)

Planting date: 8-May (delayed emergence 21-May)

Weed management: Roundup PowerMax at 22.0 oz/acre was applied preplant on 1-May with ammonium sulfate (AMS) and Interlock. Plots were sprayed with 1.3 pts/acre Dual and 1.0 qt/acre diuron pre-emerge. During the growing season the producer made 2 applications of glyphosate at 32.0 oz/acre with ammonium sulfate on 10-June and 22-July. This location was cultivated once in July.

Irrigation and rainfall: According to personal correspondence with the producer, approximately 12.5 inches of rainfall accumulated during the growing season in addition to 13.5 inches of irrigation for a total on 26.0 inches of moisture.

Insecticides: No insecticides were applied by the producer at this site. This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.

Fertilizer management: 100 lb/acre 32-0-0 was broadcast applied preplant. Also, 35 gallons/acre 24-11-05 was applied via coulter rig and an additional 9.4 gallons/acre 32-0-0 was applied via fertigation during the growing season.

Plant growth regulators: On 30-June, 10 oz/acre of Pentia was applied by producer across all varieties.

Harvest aids: Harvest aids included 1.5 pt/acre Prep and 0.5 pt/acre Def applied by producer at this location.

Harvest: Plots were harvested on 4-November using a commercial John Deere 7455 with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to record individual plot weights. Plot weights were subsequently converted to lb/acre basis.

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 $200/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:

This site experienced delayed emergence and was damaged by an early June hail event. Also, some Verticillium wilt pressure was observed. Significant differences were observed among varieties for plant population on 18-June (Table 1). Plant stands averaged 23,474 and ranged from a high of 30,579 plants/acre for Croplan Genetics 3220B2RF to a low of 16,466 for Dyna-Gro 2570B2RF. Nodes above white flower (NAWF) counts were taken on a weekly basis beginning 3-August to 25-August. Significant differences were observed among varieties for all NAWF for the 17-August observation only. On 3-August, NAWF values ranged from a low of 7.6 for All-Tex Epic RF and Stoneville 4288B2F to a high of 8.3 for Croplan Genetics 3220B2RF and Dyna-Gro 2570B2RF. The test average on 10-August was 7.0 and ranged from 6.4 (FiberMax 9180B2F) to a high of 7.5 (PhytoGen 375WRF). By 17-August two varieties, Stoneville 4288B2F and NexGen 3348B2RF, had reached cutout (NAWF=5) and values ranged from a high of 6.1 for PhytoGen 375WRF to a low of 4.8 for Stoneville 4288B2F. On 25-August, values ranged from a high of 4.7 (Dyna-Gro 2570B2RF and NexGen 3348B2RF) to a low of 4.0 (Stoneville 4288B2F) and all varieties had reached cutout.

Significant differences were observed for all yield and most fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from a low of 25.7% to a high of 28.8% for Stoneville 4288B2F and Deltapine 0912B2RF, respectively. Bur cotton yields averaged 3815 lb/acre with a high of 4224 lb/acre for FiberMax 9180B2F, to a low of 3383 lb/acre for All-Tex Epic RF. Lint yields varied with a low of 955 lb/acre

(All-Tex Epic RF) and a high of 1188 lb/acre (FiberMax 9180B2F). Average lint loan values ranged from a low of $0.4012/lb (Deltapine 0912B2RF) to a high of $0.4747/lb (FiberMax 9180B2F). After adding lint and seed value, total value/acre for varieties ranged from a low of $548.09 for Alll-Tex Epic RF to a high of $723.14 FiberMax 9180B2F. When subtracting ginning and seed and technology fee costs, the net value/acre among varieties ranged from a high of $526.61 (FiberMax 9180B2F) to a low of $378.02 (Deltapine 0912B2RF), a difference of $148.60.

Micronaire values ranged from a low of 2.2 for All-Tex Epic RF, Dyna-Gro 2570B2RF and FiberMax 9160B2F to a high of 2.5 for NexGen 3348B2RF and FiberMax 9180B2F. Staple averaged 35.8 across all varieties with a low of 34.2 for Deltapine 0912B2RF and a high of 38.5 for FiberMax 9160B2F. The highest percent uniformity was observed for FiberMax 9160B2F (81.8%) and Deltapine 0912B2RF had the lowest (78.6%). Strength values averaged 27.8 g/tex with a high of 31.3 g/tex for FiberMax 9180B2F, and a low of 25.5 g/tex for Deltapine 0912B2RF. Elongation ranged from a high of 11.7% for All-Tex Epic RF to a low of 9.3% for FiberMax 9160B2F. Leaf grades averaged 3.6 at this location. Values for reflectance (Rd) and yellowness (+b) averaged 83.0 and 8.7, respectively. Color grades of 11 were observed across all varieties.

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:

Appreciation is expressed to Boyd Jackson for the use of his land, equipment and labor for this project. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Plant stand and NAWF results from the replicated drip irrigated RACE variety demonstration, Boyd Jackson Farm, Lockney, TX, 2009.

	Plant Population		Nodes Above White Flower (NAWF) for Week of		
Entry	plants/row ft	plants/acre	3-Aug	10-Aug	17-Aug
All-Tex Epic RF	1.5	19,428	7.6	7.2	5.7
Croplan Genetics 3220B2RF	2.3	30,579	8.3	7.1	5.7
Dyna-Gro 2570B2RF	1.2	16,466	8.3	7.3	5.8
Deltapine 0912B2RF	1.5	20,125	8.0	6.7	5.5
FiberMax 9160B2F	2.1	27,094	8.0	6.9	5.3
FiberMax 9180B2F	2.2	28,837	7.8	6.4	5.1
NexGen 3348B2RF	1.6	20,822	8.2	6.8	4.9
PhytoGen 375WRF	1.7	22,390	7.7	7.5	6.1
Stoneville 4288B2F	2.0	25,526	7.6	6.8	4.8
Test average	1.8	23,474	7.9	7.0	5.4
CV, %	15.7	15.9	6.5	8.0	6.2
OSL	0.0024	0.0034	0.5572	0.4060	0.0023
LSD 0.05	0.5	6,456	NS	NS	0.6

NAWF numbers represent an average of 10 plants per rep per variety for a total of 30 plants per variety.
CV - coefficient of variation, percent.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level, NS - not significant.

Table 2. Harvest results from the replicated drip irrigated RACE variety demonstration, Boyd Jackson Farm, Lockney, 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 ----------					
FiberMax 9180B2F	28.1	47.2	4224	1188	1992	0.4747	563.74	159.39	723.14	126.72	69.80	526.61 a
FiberMax 9160B2F	26.8	46.8	4187	1123	1960	0.4622	519.06	156.82	675.88	125.60	69.80	480.48 b
NexGen 3348B2RF	27.6	46.5	3953	1089	1838	0.4425	481.78	147.00	628.78	118.58	68.46	441.75 c
Stoneville 4288B2F	25.7	48.0	4106	1055	1968	0.4472	472.04	157.48	629.52	123.16	69.80	436.55 cd
Croplan Genetics 3220B2RF	27.6	48.7	3663	1009	1784	0.4625	466.80	142.76	609.55	109.87	67.77	431.91 cd
PhytoGen 375WRF	26.6	48.0	3747	999	1798	0.4447	444.14	143.86	588.00	112.39	67.98	407.64 cde
Dyna-Gro 2570B2RF	27.8	49.0	3458	960	1694	0.4578	439.39	135.48	574.88	103.72	68.00	403.16 de
All-Tex Epic RF	28.2	47.6	3383	955	1611	0.4392	419.19	128.89	548.09	101.48	57.03	389.58 e
Deltapine 0912B2RF	28.8	47.5	3616	1043	1718	0.4012	418.29	137.46	555.75	108.47	69.26	378.02 e
Test average	27.5	47.7	3815	1047	1818	0.4480	469.38	145.46	614.84	114.44	67.54	432.86
CV, %	3.8	1.3	4.1	4.2	4.1	5.2	4.2	4.1	4.1	4.1	--	4.8
OSL	0.0618†	0.0025	<0.0001	0.0001	<0.0001	0.0628†	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001
LSD	1.5	1.1	271	76	128	0.0333	33.97	10.21	44.15	8.12	--	36.04

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, †indicates significance at the 0.10 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 3. HVI fiber property results from the replicated drip irrigated RACE variety demonstration, Boyd Jackson Farm, Lockney, 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
All-Tex Epic RF	2.2	34.7	78.0	26.6	11.7	3.3	82.6	8.9	1.0	1.0
Croplan Genetics 3220B2RF	2.4	35.6	79.0	26.8	11.4	2.0	83.6	8.8	1.0	1.0
Dyna-Gro 2570B2RF	2.2	35.1	78.9	26.7	11.6	3.0	83.5	8.8	1.0	1.0
Deltapine 0912B2RF	2.4	34.2	78.6	25.5	11.0	5.0	82.1	9.3	1.0	1.0
FiberMax 9160B2F	2.2	38.5	81.8	30.5	9.3	4.0	84.0	8.1	1.0	1.0
FiberMax 9180B2F	2.5	37.7	81.2	31.3	10.1	3.0	84.2	8.1	1.0	1.0
NexGen 3348B2RF	2.5	36.2	81.5	29.9	10.7	4.7	81.8	8.6	1.0	1.0
PhytoGen 375WRF	2.3	35.1	78.8	25.6	10.9	3.3	82.7	8.9	1.0	1.0
Stoneville 4288B2F	2.4	35.5	79.0	27.3	10.7	4.0	82.5	9.0	1.0	1.0
Test average	2.3	35.8	79.6	27.8	10.8	3.6	83.0	8.7	1.0	1.0
CV, %	3.7	2.1	1.3	3.7	3.2	37.6	0.4	2.5	--	--
OSL	0.0016	<0.0001	0.0012	<0.0001	<0.0001	0.2682	<0.0001	<0.0001	--	--
LSD	0.1	1.3	1.7	1.8	0.6	NS	0.5	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.

AgriLIFE EXTENSION
Texas A&M System

Replicated LESA Irrigated Cotton Variety Demonstration, Muleshoe, TX - 2009

Cooperator: Chris Bass

Curtis Preston, Monti Vandiver, Randy Boman, Mark Kelley and Chris Ashbrook
CEA-ANR Bailey County, EA-IPM Bailey/Parmer Counties, Extension Agronomist - Cotton, Extension Program Specialist II - Cotton, and Extension Assistant - Cotton

Bailey County

Summary: Significant differences were observed for all yield and economic parameters measured with the exception of lint turnout. Lint turnout from grab samples averaged 25.6%. Lint yields varied with a low of 1351 lb/acre (Croplan Genetics 3520B2RF) and a high of 1543 lb/acre (Deltapine 0912B2RF). Lint loan values ranged from a low of $0.4812/lb (All-Tex Epic RF) to a high of $0.5437/lb (PhytoGen 375WRF). When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $761.05 (Deltapine 0912B2RF) to a low of $586.65 (Croplan Genetics 3520B2RF), a difference of $174.40. Significant differences were observed among varieties for micronaire (alpha=0.10), strength, elongation, and plus b only. Micronaire ranged from a low of 2.8 for All-Tex Epic RF to a high of 3.6 for PhytoGen 375WRF. Staple averaged 35.8 across all varieties and percent uniformity averaged 81.5%. Strength values averaged 31.0 g/tex with a high of 33.3 g/tex for FiberMax 9180B2F, and a low of 29.5 g/tex for All-Tex Epic RF and PhytoGen 375WRF. Elongation averaged 8.8 with a high of 9.6 for All-Tex Epic RF and a low of 7.3 FiberMax 9058F. Leaf grades were high with mostly 3s, 4s, and 5s at this location. Color grades of mostly 21 and 31 were observed across varieties. 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 the Texas High Plains.

Materials and Methods:

Varieties: All Tex Epic RF, Croplan Genetics 3520B2RF, Deltapine 0912B2RF, FiberMax 9058F, FiberMax 9180B2F, NexGen 2549B2RF, PhytoGen 375WRF, Stoneville 4288B2F

Experimental design:	Randomized complete block with 3 replications
Seeding rate:	4.0 seeds/row-ft in 30-inch row spacing or approximately 69,500 seed/acre (John Deere 7300 vacuum planter)
Plot size:	6 rows by variable length of field (2411-2580 ft long)
Planting date:	6-May
Weed management:	A burndown application of glyphosate at 1.5 qt/acre was applied prior to planting (23-March) with 3.5 oz/acre of Citron. Four applications of glyphosate were applied during the growing season. Glyphosate was applied at 32 oz/acre with 3.5 oz/acre of Citron on 19-May, at 48 oz/acre with 6 oz/acre of Dual and 3.2 oz/acre Preference on 2-June, at 32 oz/acre with 2 oz/acre Staple and 32 oz/acre of Class Act on 23-June, and at 32 oz/acre with 32 oz/acre of Class Act.
Irrigation:	This location was under a LESA center pivot, however total irrigation amounts were not readily available.
Rainfall:	Based on recorded precipitation measurements from two weather stations near the location, rainfall amounts at this location were between 7.2 and 11.4" for the time period of May thru August.
Insecticides:	Temik was applied infurrow at planting at 3.5 lb/acre. An application of 3.2 oz/acre Orthene was applied with the 19-May application of glyphosate. This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.
Fertilizer management:	70 lbs N, 12 lbs P_2O_5, 11 lbs S and 1 lb Zn/acre were applied in a strip- till band and approximately 75 lbs N/acre were applied via fertigation during the growing season.
Plant growth regulators:	A single application of 18.0 oz/acre mepiquat chloride was made across all varieties at this location on 27-July.
Harvest aids:	Prep was applied at 32 oz/acre with 1 oz/acre Aim and 4 oz/acre crop oil concentrate on 6-October. A sequential application of Gramoxone Inteon was applied at 32 oz/acre on 17-October.

Harvest: Plots were harvested on 28-October using a commercial John Deere 7450 stripper harvester without 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: Gin turnouts for lint and seed were determined from grab samples taken by plot at harvest and ginned at the Texas AgriLife Research and Extension Center at Lubbock.

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 30-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 among varieties for plant population on 28-May (Table 1). Plant stands ranged from a high of 56,711 for NexGen 2549B2RF to a low of 44,144 for Deltapine 0912B2RF. On 30-July, significant differences were observed for plant height but not for nodes above white flower (NAWF). Plant measurement values reported represent averages from 10 plants per plot or 30 plants per variety. Plant height averaged 26.8" across all varieties and ranged from a high of 29.1" for PhytoGen 375WRF to a low of 25.5" for Croplan Genetics 3520B2RF. The test average for NAWF was 7.5. Significant differences were observed for NAWF on 5-August and ranged from a high of 5.6 for All-Tex Epic RF to a low of 3.9 for FiberMax 9180B2F with a test average of 4.6. Only two varieties had not reached physiological cutout (NAWF = 5) by the 5-August observation. However, all varieties had reached cutout by the final observation date on 19-August. The test average for the final NAWF observation (19-August) was 2.2 with a high of 2.8 for All-Tex Epic RF to a low of 1.9 for Deltapine 0912B2RF, FiberMax 9058F, and NexGen 2549B2RF. No significant differences were observed among varieties on 19-August for plant height (28.4" test average).

Significant differences were observed for most yield and economic parameters measured (Table 2). Lint turnout from grab samples averaged 25.6%. Bur cotton yields averaged 5724 lb/acre with a high of 5861 lb/acre for NexGen 2549B2RF,

and a low of 5381 lb/acre for All-Tex Epic RF. Lint yields varied with a low of 1351 lb/acre (Croplan Genetics 3520B2RF) and a high of 1543 lb/acre (Deltapine 0912B2RF). Lint loan values ranged from a low of $0.4812/lb (All-Tex Epic RF) to a high of $0.5437/lb (PhytoGen 375WRF). After adding lint and seed value, total value/acre for varieties ranged from a low of $845.44 for Croplan Genetics 3520B2RF to a high of $1026.19 for Deltapine 0912B2RF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $761.05 (Deltapine 0912B2RF) to a low of $586.65 (Croplan Genetics 3520B2RF), a difference of $174.40.

Significant differences were observed among varieties for micronaire (alpha=0.10), strength, elongation, and plus b only (Table 3). Micronaire ranged from a low of 2.8 for All-Tex Epic RF to a high of 3.6 for PhytoGen 375WRF. Staple averaged 35.8 across all varieties and percent uniformity averaged 81.5%. Strength values averaged 31.0 g/tex with a high of 33.3 g/tex for FiberMax 9180B2F, and a low of 29.5 g/tex for All-Tex Epic RF and PhytoGen 375WRF. Elongation averaged 8.8 with a high of 9.6 for All-Tex Epic RF and a low of 7.3 FiberMax 9058F. Leaf grades were high with mostly 3s, 4s, and 5s at this location. Color grades of mostly 21 and 31 were observed across varieties.

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.

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Table 1. Plant stand, plant height and NAWF results from the replicated irrigated RACE variety demonstration, Chris Bass Farm, Muleshoe, TX, 2009.

	Plant Population 28-May	Plant height (inches)		Nodes Above White Flower (NAWF) for Week of		
Entry	plants/acre	30-Jul	19-Aug	30-Jul	5-Aug	19-Aug
All-Tex Epic RF	50,267	27.8	29.7	8.3	5.6	2.8
Croplan Genetics 3520B2RF	53,167	25.5	28.5	6.6	4.4	2.0
Deltapine 0912B2RF	44,144	26.8	28.3	7.3	4.3	1.9
FiberMax 9058F	54,456	26.7	26.6	6.7	4.2	1.9
FiberMax 9180B2F	56,067	25.6	28.0	8.3	3.9	2.4
NexGen 2549B2RF	56,711	27.4	29.5	8.2	4.7	1.9
PhytoGen 375WRF	54,456	29.1	30.0	7.5	5.1	2.3
Stoneville 4288B2F	52,522	25.7	26.9	7.1	4.6	2.1
Test average	52,724	26.8	28.4	7.5	4.6	2.2
CV, %	6.7	3.0	5.9	12.2	10.0	11.6
OSL	0.0148	0.0008	0.1898	0.1864	0.0166	0.0008
LSD 0.05	6,183	1.4	NS	NS	0.8	0.4

NAWF numbers represent an average of 10 plants per rep per variety for a total of 30 plants per variety.
CV - coefficient of variation, percent.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level, NS - not significant.

Table 2. Harvest results from the replicated irrigated RACE variety demonstration, Chris Bass Farm, Muleshoe, 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 ----------					
Deltapine 0912B2RF	26.7	43.4	5782	1543	2508	0.5350	825.54	200.65	1026.19	173.45	91.68	761.05 a
PhytoGen 375WRF	26.1	39.9	5803	1514	2318	0.5437	823.15	185.42	1008.57	174.08	89.99	744.51 a
Stoneville 4288B2F	25.6	44.6	5813	1490	2591	0.5133	765.06	207.25	972.31	174.39	92.40	705.51 b
FiberMax 9058F	25.9	41.4	5792	1499	2398	0.5105	765.12	191.80	956.92	173.75	80.24	702.93 b
NexGen 2549B2RF	25.4	45.6	5861	1487	2671	0.4832	718.43	213.66	932.09	175.82	90.62	665.64 c
FiberMax 9180B2F	24.7	43.3	5726	1415	2480	0.5108	722.78	198.43	921.21	171.77	92.40	657.03 c
All-Tex Epic RF	26.1	42.5	5381	1405	2289	0.4812	676.27	183.13	859.40	161.44	75.50	622.46 d
Croplan Genetics 3520B2RF	24.0	41.8	5636	1351	2354	0.4863	657.15	188.29	845.44	169.07	89.72	586.65 e
Test average	25.6	42.8	5724	1463	2451	0.5080	744.19	196.08	940.27	171.72	87.82	680.72
CV, %	4.1	3.3	2.4	2.4	2.3	6.7	2.5	2.3	2.5	2.4	--	2.8
OSL	0.1183	0.0055	0.0143	0.0001	<0.0001	0.2708	<0.0001	<0.0001	<0.0001	0.0143	--	<0.0001
LSD	NS	2.5	236	62	100	NS	32.54	8.03	40.54	7.08	--	33.47

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 3. HVI fiber property results from the replicated irrigated RACE variety demonstration, Chris Bass Farm, Muleshoe, 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
All-Tex Epic RF	2.8	35.0	80.9	29.5	9.6	3.3	79.7	8.7	2.0	1.0
Croplan Genetics 3520B2RF	3.2	36.3	81.9	29.6	9.4	5.0	77.8	7.7	3.0	1.0
Deltapine 0912B2RF	3.5	35.4	81.4	31.3	9.1	4.0	79.4	7.7	3.0	1.0
FiberMax 9058F	3.1	36.6	81.0	31.7	7.3	3.7	80.1	7.2	3.0	1.0
FiberMax 9180B2F	3.2	36.8	81.7	33.3	8.2	4.3	80.1	7.2	3.0	1.0
NexGen 2549B2RF	3.3	35.4	82.2	31.9	8.8	5.7	78.4	7.6	3.3	1.0
PhytoGen 375WRF	3.6	35.2	81.9	29.5	8.7	3.7	79.6	8.2	2.7	1.0
Stoneville 4288B2F	3.2	35.7	81.2	30.9	9.1	4.3	78.7	8.2	2.7	1.0
Test average	3.2	35.8	81.5	31.0	8.8	4.3	79.2	7.8	2.8	1.0
CV, %	8.1	2.9	0.8	2.8	3.4	24.4	1.9	3.9	--	--
OSL	0.0671†	0.3374	0.2579	0.0006	<0.0001	0.1969	0.4724	0.0004	--	--
LSD	0.4	NS	NS	1.5	0.5	NS	NS	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, †indicates significance at the 0.10 level, NS - not significant.

AgriLIFE EXTENSION
Texas A&M System

Replicated LESA Irrigated Cotton Variety Demonstration, Silverton, TX - 2009

Cooperator: Gary Weaks

Nathan Carr, Randy Boman, Mark Kelley and Chris Ashbrook
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Briscoe County

Summary: Significant differences were observed for most yield and economic and some HVI fiber quality parameters measured. Lint turnout ranged from a low of 29.9% to a high of 34.6% for Croplan Genetics 3520B2RF and All-Tex Epic RF, respectively. Lint yields varied with a low of 1282 lb/acre (Croplan Genetics 3520B2RF) and a high of 1494 lb/acre (PhytoGen 375WRF). Lint loan values ranged from a low of $0.5415/lb (FiberMax 9160B2F) to a high of $0.5680/lb (Dyna-Gro 2570B2RF). When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $808.21 (Dyna-Gro 2570B2RF) to a low of $671.28 (Croplan Genetics 3520B2RF), a difference of $136.93. Micronaire values ranged from a low of 3.4 for FiberMax 9160B2F to a high of 3.9 for Deltapine 0912B2RF and NexGen 3348B2RF. Staple averaged 36.0 across all varieties with a low of 35.0 for Deltapine 0912B2RF and a high of 37.1 for FiberMax 9160B2F. No differences were observed for percent uniformity and values ranged from a high of 82.5% to a low of 81.0%. Strength values averaged 27.8 g/tex with a high of 29.0 g/tex for NexGen 3348B2RF and a low of 25.9 g/tex for Croplan Genetics 3520B2RF. 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 the Texas High Plains.

Materials and Methods:

Varieties: All-Tex Epic RF, Croplan Genetics 3520B2RF, Deltapine 0912B2RF, Dyna-Gro 2570B2RF, FiberMax 9160B2F, NexGen 3348B2RF, PhytoGen 375WRF, Stoneville 4288B2RF

Experimental design: Randomized complete block with 3 replications

Seeding rate: 4.0 seeds/row-ft in 40-inch row spacing (Case IH 1200 vacuum planter)

Plot size: 8 rows by variable length of field (777-3038 ft long)

Planting date: 13-May on the flat in terminated wheat

Weed management: An preplant application included glyphosate (1.0 qt/acre) + diuron (1.0 lb ai/acre). Two applications of Roundup PowerMax were applied during the growing season. On 29-May 22 oz/acre was applied and in late June, 32 oz/acre was applied with 3.2 oz/acre LI 700.

Irrigation: This location was under a LESA center pivot and 11.0" of total irrigation was applied during the growing season.

Rainfall: Based on personal correspondence with the grower, 17.07" of rainfall was accumulated at this location.

Insecticides: Acephate was applied at 4.0 oz/acre with the 29-May Roundup PowerMax application for thrips control. This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.

Fertilizer management: 3 tons/acre composted manure was applied pre-plant.

Plant growth regulators: A single application of 10.0 oz/acre mepichlor was made across all varieties at this location during the growing season.

Harvest aids: Ethephon was applied at 32.0 oz/acre approximately 10 day prior to freeze.

Harvest: Plots were harvested on 5 & 6-November using a commercial John Deere 7450 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:

No significant differences were observed among varieties for plant population on 18-June (Table 1). Plant stands ranged from a high of 46,609 plants/acre for PhytoGen 375WRF to a low of 40,859 for Deltapine 0912B2RF. Nodes above white flower (NAWF) counts were taken on a weekly basis beginning 27-July to 10-August. No significant differences were observed among varieties for any of the NAWF observation dates. Test averages were 5.8, 6.1 and 5.1 on 27-July, 3-August and 10-August, respectively.

Significant differences were observed for most yield and economic and some HVI fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from a low of 29.9% to a high of 34.6% for Croplan Genetics 3520B2RF and All-Tex Epic RF, respectively. Bur cotton yields averaged 4274 lb/acre with a high of 4399 lb/acre for PhytoGen 375WRF, and a low of 4003 lb/acre for All-Tex Epic RF. Lint yields varied with a low of 1282 lb/acre (Croplan Genetics 3520B2RF) and a high of 1494 lb/acre (PhytoGen 375WRF). Lint loan values ranged from a low of $0.5415/lb (FiberMax 9160B2F) to a high of $0.5680/lb (Dyna-Gro 2570B2RF). After adding lint and seed value, total value/acre for varieties ranged from a low of $867.11 for Croplan Genetics 3520B2RF to a high of $1007.31 for Dyna-Gro 2570B2RF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $808.21 (Dyna-Gro 2570B2RF) to a low of $671.28 (Croplan Genetics 3520B2RF), a difference of $136.93.

Micronaire values ranged from a low of 3.4 for FiberMax 9160B2F to a high of 3.9 for Deltapine 0912B2RF and NexGen 3348B2RF. Staple averaged 36.0 across all varieties with a low of 35.0 for Deltapine 0912B2RF and a high of 37.1 for FiberMax 9160B2F. No differences were observed for percent uniformity and values ranged from a high of 82.5% to a low of 81.0%. Strength values averaged 27.8 g/tex with a high of 29.0 g/tex for NexGen 3348B2RF and a low of 25.9 g/tex for Croplan Genetics 3520B2RF. Elongation ranged from a high of 11.8% for Croplan Genetics 3520B2RF to a low of 10.4% for FiberMax 9160B2F. Leaf grades were relatively high with a range of from 2-4 with a test average of 3.2. Values for reflectance (Rd) and yellowness (+b) averaged 82.8 and 7.9, respectively. This resulted in color grades of mostly 11 and 21 with some 31 across varieties.

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:

Appreciation is expressed to Gary Weaks for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Plant stand and NAWF results from the replicated irrigated RACE variety demonstration, Gary Weaks Farm, Silverton, TX, 2009.

Entry	Plant Population 18-Jun		Nodes Above White Flower (NAWF) for Week of		
	plants/row ft	plants/acre	27-Jul	3-Aug	10-Aug
All-Tex Epic RF	3.1	41,208	6.3	6.4	5.3
Croplan Genetics 3520B2RF	3.2	41,905	5.5	6.0	4.9
Deltapine 0912B2RF	3.1	40,859	5.6	6.4	5.2
Dyna-Gro 2570B2RF	3.3	43,299	6.3	6.2	5.0
FiberMax 9160B2F	3.3	42,689	6.2	6.1	4.9
NexGen 3348B2RF	3.5	45,128	5.4	5.9	4.8
PhytoGen 375WRF	3.6	46,609	5.8	6.3	5.6
Stoneville 4288B2F	3.2	42,602	5.4	5.7	4.7
Test average	3.3	43,037	5.8	6.1	5.1
CV, %	6.7	6.4	9.9	7.0	10.4
OSL	0.2081	0.2353	0.2980	0.3753	0.4297
LSD 0.05	NS	NS	NS	NS	NS

NAWF numbers represent an average of 10 plants per rep per variety for a total of 30 plants per variety.
CV - coefficient of variation, percent.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level, NS - not significant.

Table 2. Harvest results from the replicated irrigated RACE variety demonstration, Gary Weaks Farm, Silverton, 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 ----------					
Dyna-Gro 2570B2RF	33.7	47.6	4392	1479	2091	0.5680	840.05	167.26	1007.31	131.75	67.35	808.21 a
PhytoGen 375WRF	34.0	46.2	4399	1494	2033	0.5582	834.22	162.61	996.83	131.98	67.33	797.52 a
Deltapine 0912B2RF	33.6	47.9	4347	1462	2081	0.5495	803.33	166.47	969.80	130.42	68.60	770.78 ab
NexGen 3348B2RF	32.4	49.1	4278	1387	2101	0.5547	769.01	168.05	937.07	128.33	67.80	740.93 bc
All-Tex Epic RF	34.6	47.3	4003	1384	1892	0.5530	765.50	151.39	916.89	120.08	56.49	740.32 bc
Stoneville 4288B2F	31.3	47.9	4288	1341	2054	0.5535	742.21	164.37	906.57	128.64	69.14	708.79 cd
FiberMax 9160B2F	32.7	47.9	4195	1368	2009	0.5415	741.12	160.68	901.80	125.85	69.14	706.82 cd
Croplan Genetics 3520B2RF	29.9	48.5	4290	1282	2079	0.5467	700.79	166.31	867.11	128.70	67.13	671.28 d
Test average	32.8	47.8	4274	1400	2042	0.5531	774.53	163.39	937.92	128.22	66.62	743.08
CV, %	4.7	1.8	3.1	3.0	3.1	2.5	3.0	3.1	3.0	3.1	--	3.2
OSL	0.0342	0.0374	0.0456	0.0002	0.0229	0.4859	<0.0001	0.0231	0.0002	0.0457	--	<0.0001
LSD	2.7	1.5	231	73	111	NS	40.24	8.89	49.09	6.93	--	42.19

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 3. HVI fiber property results from the replicated irrigated RACE variety demonstration, Gary Weaks Farm, Silverton, 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
All-Tex Epic RF	3.6	35.9	81.1	27.7	11.7	2.7	82.5	8.2	1.0	1.0
Croplan Genetics 3520B2RF	3.6	36.1	81.0	25.9	11.8	4.0	82.9	7.6	2.0	1.0
Deltapine 0912B2RF	3.9	35.0	81.2	27.2	11.1	3.3	82.9	8.2	1.3	1.0
Dyna-Gro 2570B2RF	3.7	36.1	81.6	28.3	11.2	2.0	83.6	7.9	1.3	1.0
FiberMax 9160B2F	3.4	37.1	81.6	28.4	10.4	3.3	83.5	7.5	1.7	1.0
NexGen 3348B2RF	3.9	35.7	82.5	29.0	11.1	3.7	81.4	7.6	2.3	1.0
PhytoGen 375WRF	3.6	35.4	81.7	27.4	11.0	2.7	83.2	8.1	1.3	1.0
Stoneville 4288B2F	3.8	36.6	81.7	28.8	10.9	4.0	82.5	7.8	2.0	1.0
Test average	3.7	36.0	81.5	27.8	11.1	3.2	82.8	7.9	1.6	1.0
CV, %	4.1	2.0	1.3	3.8	7.4	41.9	0.6	4.3	--	--
OSL	0.0105	0.0699†	0.7556	0.0479	0.5318	0.5717	0.0023	0.1637	--	--
LSD	0.3	1.0	NS	1.8	NS	NS	0.9	NS	--	--

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.

AgriLIFE EXTENSION
Texas A&M System

Picker Harvested Replicated LEPA Irrigated Cotton Variety Demonstration, AGCARES, Lamesa, TX - 2009

Cooperators: Lamesa Cotton Growers/Texas AgriLife Research/ Texas AgriLife Extension

Jeff Wyatt, Tommy Doederlein, Randy Boman, Mark Kelley and Chris Ashbrook
CEA-ANR Dawson County, EA-IPM Dawson/Lynn Counties,
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Dawson County

Summary: Significant differences were noted for most yield and some economic parameters. Picker harvested lint turnout ranged from 35.6% for NexGen 3348B2RF to 41.5% for Deltapine 0935B2RF. Lint yields varied from a low of 974 lb/acre (NexGen 3348B2RF) to a high of 1333 lb/acre (Deltapine 0935B2RF). Lint loan values ranged from a low of $0.4842/lb to a high of $0.5598/lb for Deltapine 0935B2RF and NexGen 3348B2RF, respectively. When subtracting ginning, seed costs and technology fees, the net value/acre among varieties was not statistically different and ranged numerically from a high of $615.55 (Dyna-Gro 2570B2RF) to a low of $520.49 (NexGen 3348B2RF). Significant differences were observed for most fiber quality parameters at this location. Micronaire values ranged from a low of 3.7 for NexGen 3348B2RF to a high of 5.0 for Deltapine 0935B2RF. Staple averaged 33.7 across all varieties with a low of 31.5 (Deltapine 0935B2RF) to a high of 35.4 (NexGen 3348B2RF). Uniformity ranged from a low of 78.9 (Croplan Genetics 3220B2RF) to a high of 81.5 (NexGen 3348B2RF), and strength ranged from a low of 26.1 g/tex for Deltapine 0935B2RF to a high of 30.1 g/tex for NexGen 3348B2RF. It should be noted that no inclement weather was encountered at this location prior to picker harvest. Furthermore, some varieties may not have been suitable for picker harvesting due to greater storm resistant bolls and shorter more compact plants. Additional multi-site and multi-year applied research is needed to evaluate varieties across a series of environments.

Objective: The objective of this project was to compare agronomic characteristics, yields, gin turnout, fiber quality, and economic returns of transgenic cotton varieties under LEPA irrigated production in the Texas High Plains.

Materials and Methods:

Varieties:	All-Tex Epic RF, Croplan Genetics 3220B2RF, Deltapine 0935B2RF, Dyna-Gro 2570B2RF, FiberMax 9160B2F, NexGen 3348B2RF, PhytoGen 375WRF, and Stoneville 4288B2F
Experimental design:	Randomized complete block with 3 replications
Seeding rate:	4.0 seeds/row-ft in solid planted 40-inch row spacing (John Deere MaxEmerge vacuum planter)
Plot size:	4 rows by variable length due to circular pivot rows (586-874 ft long)
Planting date:	7-May
Fertilization:	100 lbs/acre 10-34-0 were applied on 24-March and 90 lbs N/acre as 32-0-0 were applied via fertigation at this location
Weed management:	Trifluralin was applied preplant incorporated at 1.5 qt/acre across all varieties on 10-April. Roundup PowerMax was applied over-the-top at 26 oz/acre on 28-May, and at 32 oz/acre on 8-July and on 25-July with AMS. Plots were rod-weeded on 22-April. On 4-August, plots were spot sprayed with a 1% Roundup PowerMax solution.
Irrigation	11" inches of irrigation were applied via LEPA irrigation during the growing season.

Rainfall:

April:	0.01"	August:	0.01"
May:	1.25"	September:	0.35"
June:	1.79"	October:	0.76"
July:	1.22"		

Total rainfall: 5.39"

Insecticides:	This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.
Harvest aids:	Harvest aids included 21 oz/acre Prep + 2.0 oz/acre ET with 1% v/v crop oil concentrate on 12-October followed by 24 oz/acre Gramoxone Inteon with 0.25% v/v non-ionic surfactant on 19-October.
Harvest:	Plots were harvested on 20-October using a commercial John Deere 9996 Picker. 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 AgriLife Research and Extension Center at Lubbock to determine gin turnouts.

Fiber analysis: Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University 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:

Agronomic data including plant population and nodes above white flower (NAWF) are included in Table 1. Stand counts taken on 15-June indicated significant differences among varieties with a test average of 42,253 plants/acre. Stand counts ranged from a high of 45,564 plants/acre for PhytoGen 375WRF to a low of 37,375 for All-Tex Epic RF. Weekly NAWF counts were taken beginning 13-July to 10-August. Averages were 8.0 (13-July), 5.4 (20-July), 5.2 (27-July), 4.5 (3-August), and 2.7 (10-August). Significant differences among varieties were observed for all but the 13-July observation. On 20-July, NAWF values ranged from a low of 4.7 for NexGen 3348B2RF to a high of 6.1 for All-Tex Epic RF. By 27-July two varieties, Stoneville 4288B2F and NexGen 3348B2RF, had reached cutout (NAWF=5) and values ranged from a high of 6.0 for Deltapine 0935B2RF to a low of 4.3 for NexGen 3348B2RF. On 3-August, values ranged from a high of 5.8 (Deltapine 0935B2RF) to a low of 3.5 (NexGen 3348B2RF) and all but two varieties had reached cutout. By the final observation (10-August), all varieties had reached cutout with a range from 3.8 for Deltapine 0935B2RF to a low of 2.2 for NexGen 3348B2RF.

Significant differences were noted for most yield and some economic parameters (Table 2). Picker harvested lint turnout ranged from 35.6% for NexGen 3348B2RF to 41.5% for Deltapine 0935B2RF. Lint yields varied from a low of 974 lb/acre (NexGen 3348B2RF) to a high of 1333 lb/acre (Deltapine 0935B2RF). Lint loan values ranged from a low of $0.4842/lb to a high of $0.5598/lb for Deltapine 0935B2RF and NexGen 3348B2RF, respectively. After adding lint and seed value, total value/acre ranged from a low of $670.48 for NexGen 3348B2RF, to a high of $778.52 for Deltapine 0935B2RF. When subtracting ginning, seed costs and technology fees, the net value/acre among varieties was not statistically different and ranged numerically from a high of $615.55 (Dyna-Gro 2570B2RF) to a low of $520.49 (NexGen 3348B2RF).

Significant differences were observed for most fiber quality parameters at this location (Table 3). Micronaire values ranged from a low of 3.7 for NexGen 3348B2RF to a high of 5.0 for Deltapine 0935B2RF. Staple averaged 33.7 across

all varieties with a low of 31.5 (Deltapine 0935B2RF) and a high of 35.4 (NexGen 3348B2RF). Uniformity ranged from a low of 78.9 (Croplan Genetics 3220B2RF) to a high of 81.5 (NexGen 3348B2RF), and strength ranged from a low of 26.1 g/tex for Deltapine 0935B2RF to a high of 30.1 g/tex for NexGen 3348B2RF. Significant differences were observed among varieties for percent elongation (10.6 avg), Rd or reflectance (79.5 avg) and +b or yellowness (8.6 avg), but not for leaf (1.4 avg). It should be noted that no inclement weather was encountered at this location prior to picker harvest. Furthermore, some varieties may not have been suitable for picker harvesting due to greater storm resistant bolls and shorter more compact plants. Additional multi-site and multi-year applied research is needed to evaluate varieties across a series of environments.

Acknowledgments:

Appreciation is expressed to Danny Carmichael, AgriLife Research Associate - AG-CARES, Lamesa for his cooperation with this project. Further assistance was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. We also greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Plant stand and NAWF results from the picker harvested replicated irrigated RACE variety demonstration, AG-CARES Farm, Lamesa, TX, 2009.

	Plant Population		Nodes Above White Flower (NAWF) for Week of				
Entry	plants/row ft	plants/acre	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug
All-Tex Epic RF	2.9	37,375	7.9	6.1	5.8	5.2	3.2
Croplan Genetics 3220B2RF	3.3	43,038	8.0	5.5	5.1	3.9	2.5
Dyna-Gro 2570B2RF	3.0	39,378	8.1	5.5	5.1	4.3	2.8
Deltapine 0935B2RF	3.3	42,602	8.2	5.7	6.0	5.8	3.8
FiberMax 9160B2F	3.4	45,302	8.1	5.6	5.4	4.6	2.8
NexGen 3348B2RF	3.2	42,515	8.0	4.7	4.3	3.5	2.2
PhytoGen 375WRF	3.5	45,564	8.0	5.2	5.2	4.4	2.3
Stoneville 4288B2F	3.3	42,253	8.0	5.2	4.8	4.1	2.3
Test average	3.2	42,253	8.0	5.4	5.2	4.5	2.7
CV, %	4.8	4.6	2.6	5.0	10.2	10.0	18.1
OSL	0.0032	0.0021	0.8161	0.0008	0.0365	0.0005	0.0200
LSD 0.05	0.3	3,391	NS	0.5	0.9	0.8	0.9

NAWF numbers represent an average of 10 plants per rep per variety for a total of 30 plants per variety.
CV - coefficient of variation, percent.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level, NS - not significant.

Table 2. Harvest results from the picker harvested replicated irrigated RACE variety demonstration, AG-CARES Farm, Lamesa, 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 ----------					
Dyna-Gro 2570B2RF	38.6	52.2	3137	1212	1638	0.5332	645.94	131.06	777.00	94.10	67.35	615.55
Deltapine 0935B2RF	41.5	51.7	3215	1333	1660	0.4842	645.69	132.83	778.52	96.45	68.60	613.47
All-Tex Epic RF	41.2	51.5	3029	1249	1561	0.5045	630.08	124.88	754.96	90.87	56.49	607.60
PhytoGen 375WRF	39.1	52.8	3119	1218	1646	0.5195	633.02	131.70	764.72	93.57	67.33	603.82
Stoneville 4288B2F	36.7	55.3	3064	1124	1693	0.5498	617.79	135.45	753.24	91.92	69.14	592.18
Croplan Genetics 3220B2RF	39.2	54.2	2905	1140	1575	0.5417	617.73	125.99	743.73	87.16	67.13	589.44
FiberMax 9160B2F	38.7	52.8	2845	1100	1503	0.5518	607.01	120.29	727.30	85.35	69.14	572.81
NexGen 3348B2RF	35.6	57.2	2739	974	1566	0.5598	545.16	125.32	670.48	82.19	67.80	520.49
Test average	38.8	53.5	3007	1169	1605	0.5306	617.80	128.44	746.24	90.20	66.62	589.42
CV, %	3.5	1.8	6.1	6.0	6.2	2.9	6.1	6.2	6.1	6.1	--	6.8
OSL	0.0016	<0.0001	0.0813†	0.0009	0.3467	0.0004	0.0955†	0.3459	0.1710	0.0813†	--	0.1586
LSD	2.4	1.7	263	124	NS	0.0271	54.03	NS	NS	7.89	--	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, †indicates significance at the 0.10 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 3. HVI fiber property results from the picker harvested replicated irrigated RACE variety demonstration, AG-CARES Farm, Lamesa, 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
All-Tex Epic RF	4.8	32.5	79.5	26.9	11.9	1.0	78.1	8.9	2.3	1.0
Croplan Genetics 3220B2RF	4.7	33.9	78.9	27.9	11.4	1.0	79.8	8.6	2.0	1.0
Dyna-Gro 2570B2RF	4.8	33.6	80.3	28.2	11.7	1.0	79.6	8.8	2.0	1.0
Deltapine 0935B2RF	5.0	31.5	79.3	26.1	10.8	1.7	79.8	8.8	1.7	1.0
FiberMax 9160B2F	4.2	34.6	80.6	29.4	8.8	1.3	81.1	8.1	2.0	1.0
NexGen 3348B2RF	3.7	35.4	81.5	30.1	9.6	1.7	79.2	8.5	2.7	1.0
PhytoGen 375WRF	4.4	33.3	79.0	26.6	10.4	1.7	78.9	8.2	3.0	1.0
Stoneville 4288B2F	4.7	34.6	79.9	27.9	10.4	1.7	79.3	8.6	2.0	1.0
Test average	4.5	33.7	79.9	27.9	10.6	1.4	79.5	8.6	2.2	1.0
CV, %	4.2	1.9	1.0	2.5	3.1	43.8	0.7	2.6	--	--
OSL	<0.0001	<0.0001	0.0156	<0.0001	<0.0001	0.5317	0.0004	0.005	--	--
LSD	0.3	1.1	1.4	1.2	0.6	NS	0.9	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.

AgriLIFE EXTENSION
Texas A&M System

Replicated LEPA Irrigated Cotton Variety Demonstration, Halfway, TX - 2009

Cooperator: Texas AgriLife Research Center - Halfway

Scott Adair, Randy Boman, Mark Kelley and Chris Ashbrook
CEA-ANR Hale County, Extension Agronomist - Cotton, Extension Program Specialist II - Cotton, and Extension Assistant - Cotton

Hale County

Summary: No significant differences were observed for lint turnout with an average of 29.5%. Lint yields varied from 830 lb/acre to 1042 lb/acre for Croplan Genetics 3220B2RF and NexGen 3348B2RF, respectively with a test average of 928 lb/acre. Lint loan values averaged $0.4793/lb and were not significantly different. When subtracting ginning and seed and technology fee costs, net value ranged from a high of $494.31 for NexGen 3348B2RF to a low of $366.32 for Deltapine 0924B2RF, a difference of $127.99. Micronaire differences were not significant and averaged 2.6. Staple averaged 36.5 across all varieties with a low of 35.0 (Dyna-Gro 2570B2RF) and a high of 38.7 (FiberMax 9160B2F). Percent uniformity ranged from a low of 79.1% for Dyna-Gro 2570B2RF, to a high of 82.5% for FiberMax 9160B2F. A test average strength of 28.5 g/tex was observed and PhytoGen 375WRF produced the lowest value (27.3 g/tex) and FiberMax 9160B2F produced the highest (31.0 g/tex). Values for reflectance (Rd) and yellowness (+b) averaged 81.0 and 8.8, respectively. This resulted in color grades of mostly 11 and 21 across varieties. 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 the Texas High Plains.

Materials and Methods:

Varieties: All-Tex Epic RF, Croplan Genetics 3220B2RF, Deltapine 0924B2RF, Dyna-Gro 2570B2RF, FiberMax 9160B2F, NexGen 3348B2RF, PhytoGen 375WRF, Stoneville 4288B2F

Experimental design: Randomized complete block with 3 replications

Seeding rate: 4.0 seeds/row-ft in 40-inch row spacing (John Deere 1700 Max Emerge vacuum planter)

Plot size: 4 rows by variable length of field (876-1294 ft long)

Planting date: 19-May

Weed management: Trifluralin was applied pre-plant incorporated at 24 oz/acre on 27-March. Also, three applications of 32.0 oz/acre Glystar with AMS were conducted on 17-June, 13-July and 21-August.

Irrigation and rainfall: A total of 12.3 inches of irrigation were applied at this location. In addition to irrigation, this location received 13.18 inches of rainfall from 1-April to 30-September for a total of 25.48 inches of moisture.

Insecticides: Temik was applied infurrow at planting at a rate of 3.5 lb/acre and Carbine 50WG was applied for lygus control on 28-August. This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.

Fertilizer management: On 30-June, 100 lb/acre N and 60 lb/a P_2O_5 were side-dress applied.

Harvest aids: 1.0 qt/acre Prep and 2.0 oz/acre ET were applied with 1% v/v crop oil concentrate at this location.

Harvest: Plots were harvested on 12-November using a commercial John Deere 7445 stripper harvester 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 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 among varieties for plant population on 18-June (Table 1). Plant stands averaged 35,393 and ranged from a high of 39,814 plants/acre for FiberMax 9160B2F to a low of 27,181 for Deltapine 0924B2RF. Nodes above white flower (NAWF) counts were taken on a weekly basis beginning 27-July to 25-August. Significant differences were observed among varieties for all NAWF observation dates except for 27-July. The test average on 27-July was 7.2. On 3-August, NAWF values ranged from a low of 5.9 for NexGen 3348B2Rf to a high of 7.7 for All-Tex Epic RF. The test average on 10-August was 5.7 and ranged from 4.6 (Stoneville 4288B2F) to a high of 6.6 (PhytoGen 375WRF). By 17-August four varieties had reached cutout (NAWF=5) and values ranged from a high of 6.3 for Dyna-Gro 2570B2RF and PhytoGen 375WRF to a low of 4.4 for FiberMax 9160B2F and Stoneville 4288B2F. By the final observation date on 25-August, values ranged from a high of 5.2 (Deltapine 0924B2RF) to a low of 2.8 (NexGen 3348B2RF) and all but Deltapine 0924B2RF had reached cutout.

Significant differences were observed for most yield and HVI fiber quality parameters measured (Tables 2 and 3). No significant differences were observed for lint turnout with an average of 29.5%. Bur cotton yields averaged 3155 lb/acre with a high of 3504 lb/acre for NexGen 3348B2RF, to a low of 2819 lb/acre for All-Tex Epic RF. Lint yields varied from 830 lb/acre to 1042 lb/acre for Croplan Genetics 3220B2RF and NexGen 3348B2RF, respectively with a test average of 928 lb/acre. Lint loan values averaged $0.4793/lb and were not significantly different. After adding lint and seed value, total value/acre for varieties ranged from a low of $523.84 for Deltapine 0924B2RF to a high of $667.22 for NexGen 3348B2RF. When subtracting ginning and seed and technology fee costs, net value ranged from a high of $494.31 for NexGen 3348B2RF to a low of $366.32 for Deltapine 0924B2RF, a difference of $127.99.

Micronaire differences were not significant and averaged 2.6. Staple averaged 36.5 across all varieties with a low of 35.0 (Dyna-Gro 2570B2RF) and a high of 38.7 (FiberMax 9160B2F). Percent uniformity ranged from a low of 79.1% for Dyna-Gro 2570B2RF, to a high of 82.5% for FiberMax 9160B2F. A test average strength of 28.5 g/tex was observed and PhytoGen 375WRF produced the lowest value (27.3 g/tex) and FiberMax 9160B2F produced the highest (31.0 g/tex). Elongation ranged from a high of 11.4% for Deltapine 0924B2RF to a low of 9.4% for FiberMax 9160B2F. Leaf grades averaged 3.2 at this location. Values for reflectance (Rd) and yellowness (+b) averaged 81.0 and 8.8, respectively. This resulted in color grades of mostly 11 and 21 across varieties.

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:

Appreciation is expressed to Doug Nesmith - Farm Research Service Manager and Jim Bordovsky - Research Scientist and Agricultural Engineer, Texas AgriLife Research Center, Halfway/Helms, for their assistance with this project. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Plant stand and NAWF results from the replicated LEPA irrigated RACE variety demonstration, Texas AgriLife Research Farm, Halfway, TX, 2009.

	Plant Population 18-Jun		Nodes Above White Flower (NAWF) for Week of				
Entry	plants/row ft	plants/acre	27-Jul	3-Aug	10-Aug	17-Aug	25-Aug
All-Tex Epic RF	2.8	36,939	7.5	7.7	6.4	5.4	5.0
Croplan Genetics 3220B2RF	2.8	36,678	7.5	6.6	6.0	5.6	4.6
Deltapine 0924B2RF	2.1	27,181	7.4	7.3	5.9	4.9	5.2
Dyna-Gro 2570B2RF	2.5	33,193	7.8	7.6	6.4	6.3	4.6
FiberMax 9160B2F	3.0	39,814	6.3	6.2	5.1	4.4	4.1
NexGen 3348B2RF	2.9	37,287	6.8	5.9	4.9	4.8	2.8
PhytoGen 375WRF	3.0	39,553	7.0	6.6	6.6	6.3	3.8
Stoneville 4288B2F	2.5	32,496	7.3	6.3	4.6	4.4	4.1
Test average	2.7	35,393	7.2	6.8	5.7	5.3	4.3
CV, %	13.0	13.2	8.1	9.5	14.6	12.5	15.0
OSL	0.0751†	0.0711†	0.1358	0.0268	0.0658†	0.0121	0.0119
LSD 0.05	0.5	6,702	NS	1.1	1.20	1.2	1.1

NAWF numbers represent an average of 10 plants per rep per variety for a total of 30 plants per variety.

CV - coefficient of variation, percent.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.05 level, †denotes significance at the 0.10 level, NS - not significant.

Table 2. Harvest results from the replicated LEPA irrigated RACE variety demonstration, Texas AgriLife Research Farm, Halfway, 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 ----------					
NexGen 3348B2RF	29.8	53.4	3504	1042	1869	0.4967	517.69	149.54	667.22	105.11	67.80	494.31 a
FiberMax 9160B2F	30.8	54.4	3190	982	1734	0.4968	487.84	138.75	626.59	95.70	69.14	461.76 ab
PhytoGen 375WRF	29.3	52.7	3338	979	1759	0.4805	470.24	140.75	610.99	100.15	67.33	443.52 b
Stoneville 4288B2F	28.2	54.4	3450	974	1877	0.4732	460.86	150.20	611.06	103.49	69.14	438.43 b
Dyna-Gro 2570B2RF	29.7	54.6	2891	859	1578	0.4947	425.00	126.28	551.27	86.73	67.35	397.18 c
All-Tex Epic RF	31.6	53.7	2819	891	1513	0.4615	411.08	121.04	532.12	84.58	56.49	391.04 c
Croplan Genetics 3220B2RF	27.2	53.9	3048	830	1642	0.4783	397.02	131.34	528.36	91.44	67.13	369.79 c
Deltapine 0924B2RF	29.3	55.3	2964	868	1639	0.4523	392.69	131.15	523.84	88.92	68.60	366.32 c
Test average	29.5	54.0	3151	928	1702	0.4793	445.30	136.13	581.43	94.52	66.62	420.29
CV, %	10.0	3.5	4.4	4.4	4.4	4.8	4.5	4.4	4.5	4.4	--	5.2
OSL	0.7119	0.7828	0.0001	0.0001	0.0002	0.2263	<0.0001	0.0002	<0.0001	0.0001	--	<0.0001
LSD	NS	NS	242	72	131	NS	34.96	10.45	45.39	7.25	--	38.15

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 3. HVI fiber property results from the replicated LEPA irrigated RACE variety demonstration, Texas AgriLife Research Farm, Halfway, 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
All-Tex Epic RF	2.5	35.1	79.8	27.7	11.0	3.0	80.6	9.6	1.3	1.3
Croplan Genetics 3220B2RF	2.5	37.5	80.5	28.2	10.6	3.0	82.1	8.5	1.3	1.0
Deltapine 0924B2RF	2.5	36.0	80.6	28.2	11.4	4.3	80.2	9.2	1.0	1.0
Dyna-Gro 2570B2RF	2.8	35.0	79.1	27.6	11.1	2.3	81.3	9.0	1.3	1.0
FiberMax 9160B2F	2.5	38.7	82.5	31.0	9.4	2.7	82.4	7.9	2.0	1.0
NexGen 3348B2RF	2.8	36.9	82.1	30.8	10.7	3.7	80.5	8.4	2.0	1.0
PhytoGen 375WRF	2.6	36.4	80.4	27.3	10.4	3.3	80.9	8.3	2.0	1.0
Stoneville 4288B2F	2.6	36.4	79.8	27.6	10.6	3.3	80.0	9.5	1.3	1.0
Test average	2.6	36.5	80.6	28.5	10.6	3.2	81.0	8.8	1.5	1.0
CV, %	11.3	3.2	1.2	4.7	4.8	28.5	1.1	6.6	--	--
OSL	0.7559	0.0284	0.0093	0.0181	0.0095	0.2933	0.0312	0.0338	--	--
LSD	NS	2.1	1.7	2.3	0.9	NS	1.5	1.0	--	--

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.

AgriLIFE EXTENSION
Texas A&M System

Replicated LESA Irrigated Cotton Variety Demonstration, Seminole, TX - 2009

Cooperator: Gregory Upton

Manda Cattaneo, Mark Kelley, Randy Boman, and Scott Russell
EA-IPM Gaines County, Extension Program Specialist II - Cotton, Extension Agronomist - Cotton, EA-IPM Terry and Yoakum Counties

Gaines County

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 3348B2RF and Deltapine 0935B2RF, respectively. Lint yields varied with a low of 1140 lb/acre (NexGen 3348B2RF) and a high of 1367 lb/acre (PhytoGen 375WRF). Lint loan values ranged from a low of $0.5555/lb (NexGen 2549B2RF) to a high of $0.5698/lb (Deltapine 174RF). Net value/acre among varieties ranged from a high of $754.84 (Deltapine 174RF) to a low of $636.61 (NexGen 2549B2RF), a difference of $118.23. Micronaire values ranged from a low of 4.0 for FiberMax 9160B2F and NexGen 2549B2RF to a high of 4.6 for Deltapine 0924B2RF. Staple averaged 35.4 across all varieties with a low of 34.2 for Deltapine 0935B2RF and a high of 36.5 for FiberMax 9180B2F and FiberMax 9160B2F. Percent uniformity ranged from a high of 82.5% for NexGen 3348B2RF to a low of 80.7% for PhytoGen 375WRF. Strength values averaged 29.1 g/tex with a high of 31.2 g/tex for FiberMax 9180B2RF and a low of 27.8 g/tex for Deltapine 0935B2RF. 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 B2RF, Deltapine 174RF, Deltapine 0935B2RF, Deltapine 0924B2RF Dyna-Gro 2570B2RF, FiberMax 9160B2F, FiberMax 1740B2F, FiberMax 9180B2F, NexGen 2549B2RF, NexGen 3348B2RF, PhytoGen 375WRF

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 LESA center pivot

Insecticides: No insecticides used at this site.

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 3348B2RF and Deltapine 0935B2RF,

respectively. Seed turnout ranged from a high of 52.7% for NexGen2549B2RF to a low of 47.9% for Deltapine 174RF. Bur cotton yields averaged 3636 lb/acre with a high of 3789 lb/acre for Deltapine 0924B2RF, and a low of 3421 lb/acre for FiberMax 9180B2F. Lint yields varied with a low of 1140 lb/acre (NexGen 3348B2RF) and a high of 1367 lb/acre (PhytoGen 375WRF). Lint loan values ranged from a low of $0.5555/lb (NexGen 2549B2RF) to a high of $0.5698/lb (Deltapine 174RF). After adding lint and seed value, total value/acre for varieties ranged from a low of $790.81 for NexGen 2549B2RF to a high of $918.58 for Dyna-Gro 2570B2RF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $754.84 (Deltapine 174RF) to a low of $636.61 (NexGen2549B2RF), a difference of $118.23.

Micronaire values ranged from a low of 4.0 for FiberMax 9160B2F and NexGen 2549B2RF to a high of 4.6 for Deltapine 0924B2RF. Staple averaged 35.4 across all varieties with a low of 34.2 for Deltapine 0935B2RF and a high of 36.5 for FiberMax 9180B2F and FiberMax 9160B2F. Percent uniformity ranged from a high of 82.5% for NexGen 3348B2RF to a low of 80.7% for PhytoGen 375WRF. 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 0935B2RF. Elongation ranged from a high of 10.0% for Dyna-Gro 2570B2RF to a low of 7.2% for FiberMax 9160B2F. There were no significant differences 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:

Appreciation is expressed to Gregory Upton for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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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 ----------						
Deltapine 174RF	36.3	47.9	3714	1348	1780	0.5698	767.83	142.40	910.23	111.42	43.96	754.84	a
Dyna-Gro 2570B2RF	36.1	50.6	3767	1360	1907	0.5633	766.00	152.59	918.58	113.00	50.78	754.81	a
PhytoGen 375WRF	36.5	48.6	3747	1367	1823	0.5567	760.75	145.84	906.59	112.42	50.76	743.41	a
Deltapine 0935B2RF	36.9	48.8	3680	1357	1795	0.5470	742.67	143.61	886.28	110.39	51.72	724.17	ab
FiberMax 1740B2RF	35.7	49.2	3676	1314	1808	0.5645	741.60	144.68	886.28	110.27	52.12	723.89	ab
All-Tex Apex B2RF	33.7	51.6	3713	1250	1916	0.5667	708.51	153.28	861.79	111.39	50.70	699.70	bc
Deltapine 0924B2RF	33.8	50.7	3789	1281	1919	0.5500	704.38	153.49	857.87	113.66	51.72	692.49	bc
FiberMax 9160B2F	33.8	50.0	3546	1200	1773	0.5693	683.16	141.87	825.03	106.37	52.12	666.54	cd
FiberMax 9180B2F	33.6	51.6	3421	1149	1764	0.5737	658.97	141.16	800.13	102.62	52.12	645.39	d
NexGen 3348B2RF	32.5	52.1	3513	1140	1830	0.5687	648.50	146.44	794.94	105.39	51.12	638.43	d
NexGen 2549B2RF	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.
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
All-Tex Apex B2RF	4.2	35.9	81.5	28.8	8.6	1.3	82.2	8.0	2.0	1.0
Deltapine 0924B2RF	4.6	34.7	81.5	29.0	9.2	2.0	81.2	7.7	2.7	1.0
Deltapine 0935B2RF	4.5	34.2	81.0	27.8	8.8	1.3	82.6	8.3	1.7	1.0
Deltapine 174RF	4.1	36.0	81.4	28.1	9.2	1.3	81.7	8.1	2.0	1.0
Dyna-Gro 2570B2RF	4.4	35.0	81.0	28.7	10.0	1.0	82.1	8.1	2.0	1.0
FiberMax 1740B2F	4.4	35.3	80.8	29.2	8.3	1.3	82.8	7.4	2.0	1.0
FiberMax 9160B2F	4.0	36.5	80.7	29.1	7.2	1.3	82.7	7.4	2.0	1.0
FiberMax 9180B2F	4.2	36.5	82.2	31.2	7.9	1.0	83.9	7.5	1.7	1.0
NexGen 2549B2RF	4.0	34.5	81.8	29.9	9.8	2.3	82.0	7.9	2.0	1.0
NexGen 3348B2RF	4.1	36.3	82.5	30.6	8.6	2.3	80.9	8.0	2.3	1.0
PhytoGen 375WRF	4.3	35.0	80.7	28.2	8.8	1.0	81.9	8.4	1.7	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, NS - not significant.

AgriLIFE EXTENSION
Texas A&M System

Replicated LESA Irrigated Cotton Variety Demonstration, Loop, TX - 2009

Cooperator: Ricky Mills

Manda Cattaneo, Mark Kelley, Randy Boman, and Scott Russell
EA-IPM Gaines County, Extension Program Specialist II - Cotton, Extension Agronomist - Cotton, EA-IPM Terry and Yoakum Counties

Gaines County

Summary: Significant differences were observed for most of the yield, economic and HVI fiber quality parameters measured. Lint turnout was significant at the 0.10 probability level and ranged from a low of 26.3% and a high of 31.3% for NexGen 3348B2RF and Deltapine 164B2RF, respectively. Lint yields varied with a low of 823 lb/acre (FiberMax 9160B2F) and a high of 1183 lb/acre (Deltapine 174RF). Lint loan values were not significantly different. Net value/acre among varieties ranged from a high of $611.68 (Deltapine 174RF) to a low of $294.98 (NexGen 3348B2RF), a difference of $316.70. Micronaire values ranged from a low of 3.2 for NexGen 2549B2RF to a high of 4.4 for Deltapine 0935B2RF, Deltapine 164B2RF, and PhytoGen 375WRF. Staple averaged 35.2 across all varieties with a low of 33.0 for NexGen 2549B2RF and a high of 36.4 for FiberMax 9160B2F. Strength values averaged 29.2 g/tex with a high of 31.0 g/tex for FiberMax 9180B2F and a low of 26.8 g/tex for All-Tex Apex B2RF. Elongation ranged from a high of 9.5% for Dyna-Gro 2570B2RF to a low of 6.4% for FiberMax 9160B2F. Leaf grades were relatively high with a range of 1 to 5, with a test average of 3.1. 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 B2RF, Deltapine 174RF, Deltapine 164B2RF, Deltapine 0935B2RF, Dyna-Gro 2570B2RF, FiberMax 9160B2F, FiberMax 9170B2F, FiberMax 9180B2F, NexGen 2549B2RF, NexGen 3348B2RF, PhytoGen 375WRF

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 (0.42 - 2.06 acre)

Planting date: 6-May in terminated wheat

Irrigation: This location was under a LESA center pivot

Insecticides: Temik was applied infurrow at planting at 3.5 lbs/acre.

Harvest: Plots were harvested on 20-October using a commercial stripper harvester. 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 (3 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 most of the yield, economic and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout was significant at the

0.10 probability level and ranged from a low of 26.3% and a high of 31.3% for NexGen 3348B2RF and Deltapine 164B2RF, respectively. Seed turnout ranged from a high of 44.0% for FiberMax 9160B2F to a low of 39.9% for Deltapine 174RF. Bur cotton yields were significant at the 0.10 probability level and averaged 3392 lb/acre with a high of 4013 lb/acre for Deltapine 174RF, and a low of 2971 lb/acre for FiberMax 9160B2F. Lint yields varied with a low of 823 lb/acre (FiberMax 9160B2F) and a high of 1183 lb/acre (Deltapine 174RF). Lint loan values did not significantly differ. After adding lint and seed value, total value/acre for varieties ranged from a low of $449.12 for NexGen 3348B2RF to a high of $776.03 for Deltapine 174RF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $611.68 (Deltapine 174RF) to a low of $294.98 (NexGen 3348B2RF), a difference of $316.70.

Micronaire values ranged from a low of 3.2 for NexGen 2549B2RF to a high of 4.4 for Deltapine 0935B2RF, Deltapine 164B2RF, and PhytoGen 375WRF. Staple averaged 35.2 across all varieties with a low of 33.0 for NexGen 2549B2RF and a high of 36.4 for FiberMax 9160B2F. Percent uniformity did not significantly differ. Strength values averaged 29.2 g/tex with a high of 31.0 g/tex for FiberMax 9180B2F and a low of 26.8 g/tex for All-Tex Apex B2RF. Elongation ranged from a high of 9.5% for Dyna-Gro 2570B2RF to a low of 6.4% for FiberMax 9160B2F. Leaf grades were relatively high with a range of 1 to 5, with a test average of 3.1. Values for reflectance (Rd) and yellowness (+b) averaged 80.2 and 7.9, respectively. This resulted in color grades of 21s and 31s.

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:

Appreciation is expressed to Ricky Mills for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Harvest results from the replicated irrigated cotton variety demonstration, Ricky Mills Farm, Loop, 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 ----------						
Deltapine 174RF	29.5	39.9	4013	1183	1601	0.5477	647.93	128.09	776.03	120.38	43.96	611.68	a
Deltapine 164B2RF	31.3	46.0	3458	1081	1588	0.5698	616.35	127.08	743.43	103.73	50.82	588.88	a
Dyna-Gro 2570B2RF	29.7	46.1	3402	1010	1567	0.5542	558.68	125.40	684.08	102.05	50.78	531.25	ab
PhytoGen 375WRF	30.2	42.0	3324	1004	1394	0.5572	559.05	111.55	670.60	99.73	50.76	520.11	ab
All-Tex Apex B2RF	27.1	42.5	3612	979	1534	0.5587	547.85	122.70	670.54	108.37	50.70	511.48	abc
Deltapine 0935B2RF	30.5	42.0	3344	1018	1406	0.5363	549.00	112.46	661.45	100.32	51.72	509.42	abc
FiberMax 9170B2F	29.3	42.6	3170	928	1351	0.5652	524.09	108.09	632.18	95.10	52.12	484.95	abc
FiberMax 9180B2F	27.1	44.7	3369	912	1506	0.5653	515.45	120.51	635.96	101.08	52.12	482.75	abc
FiberMax 9160B2F	27.7	44.0	2971	823	1309	0.5335	438.72	104.70	543.42	89.13	52.12	402.17	bcd
NexGen 2549B2RF	27.0	45.4	3212	866	1456	0.4642	402.15	116.48	518.63	96.36	51.12	371.15	cd
NexGen 3348B2RF	26.3	45.7	3434	904	1571	0.3988	323.48	125.64	449.12	103.02	51.12	294.98	d
Test average	28.7	43.7	3392	973	1480	0.5319	516.61	118.43	635.04	101.75	50.67	482.62	
CV, %	7.1	2.7	9.7	9.4	9.5	13.9	16.5	9.5	13.8	9.7	--	17.6	
OSL	0.0774†	<0.0001	0.0948†	0.0058	0.1833	0.1955	0.0064	0.1836	0.0066	0.0948†	--	0.0068	
LSD	2.9	2.0	462	156	NS	NS	145.40	NS	149.44	13.86	--	144.77	

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, †indicates significance at the 0.10 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, Ricky Mills Farm, Loop, 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
All-Tex Apex B2RF	4.2	35.2	80.4	26.8	8.5	2.7	80.6	8.2	2.3	1.0
Dyna-Gro 2570B2RF	4.2	34.5	80.9	29.3	9.5	2.3	80.5	8.4	2.0	1.0
Deltapine 0935B2RF	4.4	33.7	80.1	28.0	8.6	1.7	81.0	8.4	2.0	1.0
Deltapine 164B2RF	4.4	35.6	80.8	29.3	7.9	1.7	81.7	7.8	2.0	1.0
Deltapine 174RF	4.0	35.6	80.3	28.1	8.8	3.7	79.5	7.8	3.0	1.0
FiberMax 9160B2F	3.7	36.4	81.3	30.3	6.4	4.3	80.3	7.5	2.7	1.0
FiberMax 9170B2F	3.8	36.1	80.8	30.9	7.4	3.0	81.6	7.3	2.3	1.0
FiberMax 9180B2F	3.7	36.1	81.1	31.0	7.6	3.0	81.0	7.3	2.7	1.0
NexGen 2549B2RF	3.2	33.0	80.6	29.7	8.7	5.0	77.4	7.9	3.0	1.0
NexGen 3348B2RF	3.7	35.9	81.3	29.3	8.1	4.7	78.6	7.8	3.0	1.0
PhytoGen 375WRF	4.4	34.7	81.1	28.0	8.3	2.3	79.8	8.2	2.3	1.0
Test average	4.0	35.2	80.8	29.2	8.2	3.1	80.2	7.9	2.5	1.0
CV, %	5.2	1.9	0.7	1.9	3.5	34.3	1.0	2.6	--	--
OSL	<0.0001	<0.0001	0.2297	<0.0001	<0.0001	0.0081	<0.0001	<0.0001	--	--
LSD	0.3	1.1	NS	0.9	0.5	1.8	1.4	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, NS - not significant.

AgriLIFE EXTENSION
Texas A&M System

Replicated LESA Irrigated Cotton Variety Demonstration, White Deer, TX - 2009

Cooperator: Dudley Pohnert

Jody Bradford, Brent Bean, Randy Boman, Mark Kelley, Rex Brandon, Bob Villarreal, and Jake Robinson - CEA-ANR Carson County, Extension Agronomist - Amarillo, Extension Agronomist - Cotton - Lubbock, Extension Program Specialist II - Cotton, AgriLife Research Assistants

Carson County

Summary: The varieties with the highest net value were NexGen 1551RF at $444.08 and Deltapine 104B2RF at $421.15 (Table 1). These had a net value of $75.00/acre more than all other varieties. When subtracting ginning, seed and technology fee costs, the average net value/acre of all varieties was $316.02. Lint yield ranged from a low of 633 lb/acre with Croplan Genetics 3220B2RF to a high of 1,010 lb/acre with Deltapine 104B2RF. Lint turnout varied considerably, ranging from 20% (Croplan Genetics 3220B2RF) to 24.8% (NexGen 1551RF). Lint loan values ranged from a low of $0.3845/lb (NexGen 1572RF) to a high of $0.5055/lb (NexGen 1551RF). Micronaire of most varieties was clustered around the test average of 2.3 (Table 2). However, NexGen 1551RF micronaire was 2.9. The test average for staple was 36. The highest percent uniformity was observed with NexGen 1551B2RF (81.9%) and PhytoGen 315RF had the lowest (77.6%). Strength values ranged from a high of 30.5 g/tex (NexGen 1551B2RF) to a low of 24.1 g/tex (Deltapine 0912B2RF).

Objective: The objective of this project was to compare agronomic characteristics, yield, gin turnout, fiber quality, and economic returns of transgenic cotton varieties under irrigated production in the Texas Panhandle.

Materials and Methods:

Varieties: Croplan Genetics 3220B2RF, Deltapine 0912B2RF, Deltapine 0924B2RF, Deltapine 104B2RF, Deltapine 121RF, FiberMax 9058F, FiberMax 9180B2F, NexGen 1551RF, NexGen 1572RF, NexGen 2549B2RF, NexGen 3410RF, PhytoGen 315RF

Experimental design: Randomized complete block with 3 replications

Seeding rate:	4.1 seeds/row-ft in 30-inch row spacing (71,500 seeds/acre)
Plot Size:	8 rows by approximately 509 ft
Planting date:	20-May
Rainfall/Irrigation:	Approximately 8" of rainfall was accumulated from 25-May through 29-October. During the growing season, 4.5" of irrigation were applied through a LESA center pivot.
Herbicides:	Diuron at 1.5 pt/acre was applied pre-emergence. Roundup PowerMax at 22 oz/acre with 8.5 lb/100 gal. ammonium sulfate was applied three times during the season. (29-May, 2-July, and 24-July).
Insecticides:	4 lbs/acre Temik was applied infurrow at planting
Fertilizer management:	At planting 35 lbs N/acre, using 32-0-0, and 1lb Zn/acre were applied. An additional 32 lbs N/acre was applied through pivot irrigation at first bloom.
Plant Growth Regulators:	Applied 16 ozs/acre mepiquat chloride on 25-July. An additional 16 ozs/acre of mepiquat chloride were applied on 25-August.
Harvest aids:	Applied 1 qt/acre Prep 12-October
Harvest:	Plots were harvested on 28-November using a commercial John Deere 7450 stripper harvester with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine 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 (4.1 seed/row-ft) for the 30-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:

Lint turnout ranged from a low of 20% to a high of 24.8% for Croplan Genetics 3220B2RF and NexGen 1551RF, respectively (Table 1). Bur cotton yields averaged 3,621 lb/acre with a high of 4328 lb/acre for Deltapine 104B2RF, and a low of 3,178 lb/acre for Croplan Genetics 3220B2RF. Lint yields varied with a low of 633 lb/acre (Croplan Genetics 3220B2RF) and a high of 1,010 lb/acre (Deltapine 104B2RF). Lint loan values ranged from a low of $0.3845/lb (NexGen 3410RF) to a high of $0.5055/lb (NexGen 1551RF). After adding lint and seed value, total value/acre for varieties ranged from a low of $401.60 for Croplan Genetics 3220B2RF to a high of $642.46 for Deltapine 104B2RF. After subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $444.08 (NexGen 1551RF) to a low of $213.95 (Croplan Genetics 3220B2RF), a difference of $230.13.

Micronaire values ranged from a low of 2.1 for Deltapine 0912B2RF and PhytoGen 315RF to a high of 2.9 for NexGen 1551RF. Most micronaire values were clustered around the mean of 2.3. Staple averaged 36.0 across all varieties with a low of 34.4 for PhytoGen 315RF to a high of 38.3 for NexGen 3410RF. The highest percent uniformity was observed for NexGen 1551RF (81.9%) and PhytoGen 315RF had the lowest (77.6%). Strength values averaged 26.3 g/tex with a high of 30.5 g/tex for NexGen 1551RF and a low of 22.5 for PhytoGen 315RF. Elongation ranged from a high of 11.2% for Deltapine 104B2RF and Deltapine 0924B2RF to a low of 9.7% for FiberMax 9058F. Leaf grades were relatively high with a range from 2.0 to 6.3 with a test average of 4.0. Values for reflectance (Rd) and yellowness (+b) averaged 80.9 and 8.5, respectively.

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 eight inches of rainfall received during the growing season made a significant impact on yield. Additional multi site and multi year applied research is needed to evaluate varieties and technology across a series of environments.

Acknowledgments:

Appreciation is expressed to Dudley Pohnert for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Harvest results from the replicated LESA irrigated cotton variety demonstration, Dudley Pohnert Farm, White Deer, 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 ----------						
NexGen 1551RF	24.8	50.8	3837	951	1949	0.5055	480.94	155.92	636.86	115.12	77.66	444.08	a
Deltapine 104B2RF	23.4	52.4	4328	1010	2268	0.4567	461.01	181.46	642.46	129.84	91.48	421.15	a
NexGen 1572RF	22.0	49.8	3840	847	1911	0.4545	384.76	152.85	537.62	115.18	77.66	344.78	b
NexGen 3410RF	23.8	52.4	4066	966	2130	0.3845	371.56	170.36	541.92	121.98	77.66	342.28	b
FiberMax 9058F	24.3	48.8	3639	884	1776	0.4215	372.18	142.12	514.29	109.16	93.23	311.90	bc
NexGen 2549B2RF	22.6	46.7	3499	791	1634	0.4548	360.16	130.71	490.87	104.97	80.18	305.71	bc
Deltapine 121RF	24.1	49.4	3559	858	1757	0.4142	355.47	140.58	496.05	106.76	94.32	294.96	cd
FiberMax 9180B2F	21.8	48.1	3590	781	1726	0.4590	358.38	138.06	496.44	107.70	95.06	293.67	cd
PhytoGen 315RF	22.4	48.3	3433	767	1657	0.4505	345.78	132.52	478.31	103.00	82.55	292.76	cd
Deltapine 0912B2RF	23.2	48.9	3268	757	1598	0.4402	333.81	127.81	461.62	98.03	94.32	269.27	cd
Deltapine 0924B2RF	22.5	49.0	3213	723	1575	0.4258	308.22	126.02	434.24	96.39	80.14	257.70	d
Croplan Genetics 3220B2RF	20.0	48.3	3178	633	1536	0.4398	278.74	122.86	401.60	95.35	92.30	213.95	e
Test Avg.	22.9	49.4	3621	831	1793	0.4423	367.58	143.44	511.02	108.6	86.38	316.02	
CV	5.1	2.4	4.6	4.6	4.7	4	6.5	4.7	5.8	4.6	--	8.0	
OSL	0.0033	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	
LSD (P=.05)	2.0	2.0	280	65	142	0.0299	40.73	11.31	49.97	8.41	--	43.03	

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:
$3.00/cwt ginning cost.
$160/ton for seed.
Lint value based on CCC loan value from grab samples and FBRI HVI results.

Table 2. HVI fiber property results from the replicated LESA irrigated cotton variety demonstration, Dudley Pohnert Farm, White Deer, 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
Croplan Genetics 3220B2RF	2.2	35.6	78.3	25.1	11.0	3.3	82.2	8.2	1.3	1.0
Deltapine 0912B2RF	2.1	35.0	78.7	24.1	10.7	4.7	78.5	9.7	1.7	1.7
Deltapine 0924B2RF	2.2	35.0	79.2	25.4	11.2	3.7	81.7	8.6	1.0	1.0
Deltapine 104B2RF	2.3	36.6	80.5	28.4	11.2	4.0	80.7	8.3	2.3	1.0
Deltapine 121RF	2.2	36.1	79.8	25.7	10.8	3.3	80.9	8.9	1.3	1.0
FiberMax 9058F	2.2	37.1	78.9	25.8	9.7	4.0	82.7	7.8	1.7	1.0
FiberMax 9180B2F	2.2	37.8	80.5	28.8	9.9	4.0	82.6	7.3	2.0	1.0
NexGen 1551RF	2.9	35.9	81.9	30.5	10.2	2.0	80.3	8.9	1.7	1.0
NexGen 1572RF	2.2	35.6	78.0	25.6	10.2	6.3	79.4	7.9	3.0	1.0
NexGen 2549B2RF	2.4	34.5	80.8	26.2	11.1	5.3	80.3	8.8	1.7	1.0
NexGen 3410RF	2.2	38.3	80.2	27.9	10.1	4.3	79.9	8.6	2.0	1.0
PhytoGen 315RF	2.1	34.4	77.6	22.5	10.1	3.0	81.2	9.3	1.0	1.0
Test average	2.3	36.0	79.5	26.3	10.5	4.0	80.9	8.5	1.7	1.1
CV, %	4.0	1.5	0.9	4.2	2.4	17.8	1.6	6.4	--	--
OSL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0108	0.0011	--	--
LSD	0.2	0.9	1.2	1.9	0.4	1.2	2.1	0.9	--	--

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level.

AgriLIFE EXTENSION
Texas A&M System

Replicated LESA Irrigated Cotton Variety Demonstration, Sunray, TX - 2009

Cooperator: Tommy Cartrite

Marcel Fischbacher, David Graf, Brent Bean, Randy Boman, Mark Kelley, Rex Brandon, - CEA-ANR Moore County, CEA-ANR Sherman County, Extension Agronomist - Amarillo, Extension Agronomist-Cotton - Lubbock, Extension Program Specialist II - Cotton, AgriLife Research Assistant

Moore County

Summary: Extreme immaturity resulted in abnormally low quality leaf and color grades, which caused extremely low loan values. Therefore, leaf and color grades were set at 3 and 32, respectively. Average lint yield was 539 lb/acre and varied from a low of 336 lb/acre for Deltapine 0924B2RF to a high of 758 lb/acre for Deltapine 104B2RF. Average lint turnout was 19.2%. Lint loan values averaged $0.4158. When subtracting ginning, seed and technology fee costs, the average net value/acre across varieties was $139.10. Net value per acre ranged from a high of $256.14 for Deltapine 104B2RF to a low of $37.79 for Deltapine 0924B2RF, a difference of $218.35. Micronaire averaged 2.2 with Deltapine 104B2RF being the highest at 2.4. Average staple was 36.0 across all varieties. The highest uniformity was observed for FiberMax 9180B2F and Deltapine 104B2RF (80.5%), and NexGen 1572RF had the lowest at 76.9%. Strength values ranged from a low of 21.2 g/tex (Deltapine 0912B2RF) to a high of 28.2 g/tex (Deltapine 104B2RF).

Objective: The objective of this project was to compare yields, gin turnout, fiber quality, and economic returns of transgenic cotton varieties under LESA center pivot irrigated production in the Texas Panhandle.

Materials and Methods:

Varieties: All-Tex Summit B2RF, Croplan Genetics 3220B2RF, Deltapine 104B2RF, Deltapine 121RF, Deltapine 0912B2RF, Deltapine 0924B2RF, FiberMax 9058F, FiberMax 9180B2F, NexGen 1551RF, NexGen 1572RF, NexGen 2549B2RF, NexGen 3410RF, and PhytoGen 315RF

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3.3 seeds/row-ft in 20-inch row spacing (85,268 seed/acre)

Plot Size:	12 rows approximately 618 ft in length
Planting date:	13-May
Weed management:	Preplant application of 28 ozs/acre RT3 (glyphosate). Preplant application of 2 pts/acre Prowl H_20. Two in-season applications of 28 ozs/acre Roundup PowerMax.
Rainfall and Irrigation:	5 inches pre-irrigation and 8 inches in-season irrigation with LESA center pivot system. 10 inches rainfall after 15-July.
Insecticides:	3 ozs/acre acephate on 15-June and 4 ozs/acre acephate on 12-July.
Fertilizer management:	72 lbs N/acre as anhydrous ammonia (82-0-0) and 14 lbs N and 48 lbs P_2O_5/acre as 10-34-0 prior to planting.
Plant growth regulators:	Applied mepiquat chloride at 20 ozs/acre on 28-July.
Harvest aids:	One harvest aid application was applied consisting of 32 ozs/acre ethephon and 1 oz/acre Aim with crop oil concentrate at 1% volume/volume.
Harvest:	Plots were harvested on 25-November 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 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 Commodity Credit Corporation (CCC) loan values were determined for each variety by plot.
Ginning cost and seed value:	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 (3.3 seed/row-ft) for the 20-inch row spacing and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: http://www.plainscotton.org/Seed/PCGseed10.xls . **This does not allow for the Technology Fee Cap Cost Program; therefore, actual technology fees for this seeding rate are over-estimated.**

Results and Discussion:

Extreme immaturity resulted in abnormally low quality leaf and color grades, which caused extremely low loan values. Therefore, leaf and color grades were set at 3 and 32, respectively.

Lint turnout ranged from a low of 16.2% to a high of 21.0% for Croplan Genetics 3220B2RF and Deltapine 121RF, respectively. Bur cotton yields varied considerably, ranging from a low of 1,938 for Deltapine 0924B2RF to a high of 3,659 for Deltapine 104B2RF. Lint yields varied from a low of 336 lb/acre (Deltapine 0924B2RF) to a high of 758 lb/acre (Deltapine 104B2RF). After adjusting leaf and color grades, lint loan values averaged $0.4158/lb. After adding lint and seed value, total value/acre ranged from a low of $208.43 for Deltapine 0924B2RF to a high of $475.00 for Deltapine 104B2RF. When subtracting ginning, seed and technology fee costs (no cap cost applied), the net value/acre among varieties ranged from a low of $37.79 for Deltapine 0924B2RF to a high of $256.14 for Deltapine 104B2RF, a difference of $218.35.

Micronaire values ranged from a low of 2.0 for Deltapine 0912B2RF to a high of 2.4 for Deltapine 104B2RF. Staple averaged 36.0 across all varieties with a low of 34.6 for Deltapine 0912B2RF to a high of 37.7 for FiberMax 9180B2F. The highest uniformity was observed for FiberMax 9180B2RF and Deltapine 104B2RF (80.5%) and NexGen 1572RF had the lowest with 76.9%. Strength averaged 24.3 g/tex with a high of 28.2 g/tex for Deltapine 104B2RF and a low of 21.2 g/tex for Deltapine 0912B2RF. Significant differences were observed among varieties for elongation (10.2% average), Rd or reflectance (73.8 average) and +b or yellowness (10.3 average).

These data indicate that substantial differences can be obtained in terms of net value/acre due to variety and technology selection. Additional multi site and multi-year applied research is needed to evaluate varieties and technology across a series of environments.

Acknowledgments:

Appreciation is expressed to Tommy Cartrite for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Harvest results from the replicated irrigated cotton variety demonstration, Tommy Cartrite Farm, Sunray, 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 ----------						
Deltapine 104B2RF	20.8	49.8	3659	758	1819	0.4352	329.48	145.52	475.00	109.77	109.09	256.14	a
NexGen 1572RF	19.6	48.7	3413	675	1656	0.4075	275.69	132.50	408.19	102.39	92.61	213.19	ab
NexGen 3410RF	20.3	48.6	3103	633	1511	0.4227	268.57	120.87	389.43	93.10	92.61	203.72	abc
NexGen 1551RF	19.4	47.8	3124	607	1486	0.4268	258.12	118.90	377.01	93.71	92.61	190.69	abc
NexGen 2549B2RF	20.1	44.2	3047	612	1349	0.4120	252.23	107.91	360.13	91.41	111.18	157.54	bcd
Deltapine 121RF	21.0	44.7	2595	547	1165	0.4145	227.94	93.17	321.11	77.84	95.62	147.65	bcd
FiberMax 9180B2RF	20.4	46.2	3078	555	1259	0.4365	242.26	100.71	342.96	92.35	113.37	137.24	cd
FiberMax 9058F	19.5	43.9	2475	483	1089	0.4162	201.01	87.11	288.13	74.25	98.45	115.43	de
All-Tex Summit B2RF	18.1	45.6	2568	464	1169	0.4025	187.10	93.52	280.63	77.04	110.27	93.32	def
Deltapine 0912B2RF	17.8	45.6	2257	404	1030	0.3940	159.69	82.44	242.13	67.70	112.49	61.94	ef
Croplan Genetics 3220B2RF	16.2	42.2	2404	391	1012	0.3975	155.70	81.00	236.70	72.12	110.07	54.51	ef
Deltapine 0924B2RF	17.3	42.1	1938	336	817	0.4238	143.10	65.32	208.43	58.15	112.49	37.79	f
Test average	19.2	45.8	2805	539	1280	0.4158	225.07	102.41		84.15	104.24	139.10	
CV, %	6.7	4.8	14.3	16.0	13.7	2.9	16.7	14.0	15.5	14.3	--	30.1	
OSL	0.0022	0.0032	0.0008	0.0001	<0.0001	0.0030	<0.0001	<0.0001	<0.0001	0.0008	--	<0.0001	
LSD	2.2	3.7	677	146	296	0.0205	63.52	23.69	85.86	20.32	--	70.80	

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.
No Cap Cost for seed and technology and 85,268 seed/acre dropped.

Table 2. HVI fiber property results from the irrigated replicated cotton variety demonstration, Tommy Cartrite Farm, Sunray, TX, 2009.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Rd	+b
	units	32^{nds} inches	%	g/tex	%	reflectance	yellowness
All-Tex Summit B2RF	2.1	34.9	78.4	22.6	10.6	73.5	10.8
Croplan Genetics 3220B2RF	2.1	35.0	77.3	22.1	10.3	74.4	11.2
Deltapine 0912B2RF	2.0	34.6	78.0	21.2	9.9	74.8	10.3
Deltapine 0924B2RF	2.1	35.8	79.1	23.9	10.5	71.3	10.8
Deltapine 104B2RF	2.4	36.6	80.5	28.2	10.7	72.9	10.6
Deltapine 121RF	2.2	35.5	79.1	24.1	10.4	72.1	11.2
FiberMax 9058F	2.1	36.9	77.7	24.0	9.2	74.7	9.8
FiberMax 9180B2RF	2.2	37.7	80.5	26.5	10.2	77.9	8.8
NexGen 1551RF	2.2	36.2	79.6	26.2	10.4	74.2	10.2
NexGen 1572RF	2.1	35.7	76.9	23.3	10.1	74.4	9.6
NexGen 2549B2RF	2.2	35.1	79.4	24.2	10.5	71.1	10.6
NexGen 3410RF	2.1	37.5	78.6	24.8	10.1	74.0	10.0
Test average	2.2	36.0	78.7	24.3	10.2	73.8	10.3
CV, %	4.6	2.0	1.5	6.5	3.7	1.8	4.4
OSL	0.0103	0.0002	0.0114	0.0012	0.0094	0.0010	<0.0001
LSD	0.2	1.2	2.0	2.7	0.6	2.3	0.8

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level.
Leaf values were set at 3 and color grades were set at 32.

AgriLIFE EXTENSION
Texas A&M System

Replicated LESA Irrigated Cotton Variety Demonstration Under Root-Knot Nematode Pressure, Seminole, TX - 2009

Cooperator: Gregory Upton

Manda Cattaneo, Mark Kelley, Terry Wheeler, Randy Boman, and Scott Russell
EA-IPM Gaines County, Extension Program Specialist II - Cotton, Research Plant Pathologist, and Extension Agronomist - Cotton, EA-IPM Terry and Yoakum Counties

Gaines County

Summary: Significant differences were observed for all yield and economic parameters, and most of the HVI fiber quality parameters measured. Lint turnout ranged from a low of 28.7% and a high of 37.0% for All-Tex Apex B2RF and Dyna-Gro 2570B2RF, respectively. Lint yields varied with a low of 1009 lb/acre (FiberMax 9180B2F) and a high of 1396 lb/acre (Deltapine 174RF). Lint loan values ranged from a low of $0.5313/lb (NexGen 2549B2RF) to a high of $0.5727/lb (FiberMax 9160B2F). Net value/acre among varieties ranged from a high of $766.41 (Deltapine 174RF) to a low of $559.05 (FiberMax 9180B2F), a difference of $207.36. Staple averaged 35.26 across all varieties with a low of 33.1 for NexGen 2549B2RF and a high of 36.6 for FiberMax 9160B2F. Uniformity ranged from a high of 82.5% for FiberMax 9160B2F and FiberMax 9180B2F to a low of 80.7% for Deltapine 0935B2RF and All-Tex Apex B2RF. Strength values averaged 30.3 g/tex with a high of 32.3 g/tex for FiberMax 9180B2F and a low of 28.6 g/tex for All-Tex Apex B2RF. These data indicate that substantial differences can be obtained in terms of net value/acre due to variety and technology selection under Root-knot nematode pressure.

Objective: The objective of this project was to compare agronomic characteristics, yields, gin turnout, fiber quality, and economic returns of transgenic cotton varieties under Root-knot nematode pressure in Gaines County.

Materials and Methods:

Varieties: All-Tex Apex B2RF, Deltapine 174RF, Dyna-Gro 2570B2RF, FiberMax 9160B2F, FiberMax 1740B2F, FiberMax 9180B2F, Stoneville 5458B2F, Deltapine 0924B2RF, Deltapine 0935B2RF, NexGen 2549B2RF, NexGen 3348B2RF, PhytoGen 375WRF

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 (833 - 2536 ft long)
Planting date:	19 May in terminated wheat
Irrigation:	This location was under a LESA center pivot
Insecticides:	No insecticides were utilized at this location.
Harvest:	Plots were harvested on 6 & 7-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 (3.0 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 parameters, and most of the HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 28.7% and a high of 37.0% for All-Tex Apex B2RF and Dyna-Gro 2570B2RF, respectively. Seed turnout ranged from a high of 53.3% for NexGen 2549B2RF to a low of 44.6% for Deltapine 174RF. Bur cotton yields averaged 3458 lb/acre with a high of 4034 lb/acre for Deltapine 174RF, and a low of 3139 lb/acre for FiberMax 9180B2F. Lint yields varied with a low of 1009 lb/acre (FiberMax 9180B2F) and a high of 1396 lb/acre (Deltapine 174RF). Lint loan values

ranged from a low of $0.5313/lb (NexGen 2549B2RF) to a high of $0.5727/lb (FiberMax 9160B2F). After adding lint and seed value, total value/acre for varieties ranged from a low of $705.33 for FiberMax 9180B2F to a high of $931.40 for Deltapine 174RF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $766.41 (Deltapine 174RF) to a low of $559.05 (FiberMax 9180B2F), a difference of $207.36.

Micronaire values were not significantly different and averaged 4.3. Staple averaged 35.3 across all varieties with a low of 33.1 for NexGen 2549B2RF and a high of 36.6 for FiberMax 9160B2F. Uniformity ranged from a high of 82.5% for FiberMax 9160B2F and FiberMax 9180B2F to a low of 80.7% for Deltapine 0935B2RF and All-Tex Apex B2RF. Strength values averaged 30.3 g/tex with a high of 32.3 g/tex for FiberMax 9180B2F and a low of 28.6 g/tex for All-Tex Apex B2RF. Elongation ranged from a high of 11.7% for Dyna-Gro 2570B2RF to a low of 8.8% for FiberMax 9160B2F. There was no significant difference in leaf grades. Values for reflectance (Rd) and yellowness (+b) averaged 82.8 and 7.9, respectively. This resulted in color grades of 11s and 21s.

These data indicate that substantial differences can be obtained in terms of net value/acre due to variety and technology selection under Root-knot nematode pressure. 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:

Appreciation is expressed to Gregory Upton for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Harvest results from the replicated nematode cotton variety demonstration, Gregory Upton Farm, 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 ----------						
Deltapine 174RF	34.6	44.6	4034	1396	1798	0.5645	787.58	143.82	931.40	121.02	43.96	766.41	a
Stoneville 5458B2F	33.8	51.1	3946	1333	2017	0.5607	747.27	161.31	908.58	118.38	52.12	738.07	a
Dyna-Gro 2570B2RF	37.0	51.5	3539	1310	1823	0.5693	745.43	145.81	891.24	106.16	50.78	734.30	a
Deltapine 0924B2RF	33.1	51.5	3708	1226	1910	0.5667	694.82	152.81	847.64	111.24	51.72	684.68	b
Deltapine 0935B2RF	36.3	49.4	3448	1249	1704	0.5547	692.07	136.35	828.42	103.44	51.72	673.26	b
PhytoGen 375WRF	35.6	49.6	3218	1144	1596	0.5663	648.69	127.71	776.40	96.53	50.76	629.11	c
FiberMax 1740B2F	36.0	50.1	3143	1131	1575	0.5463	618.97	126.02	744.99	94.28	52.12	598.59	cd
FiberMax 9160B2F	33.4	50.7	3222	1077	1634	0.5727	616.68	130.70	747.37	96.67	52.12	598.58	cd
NexGen 3348B2RF	33.4	53.0	3186	1063	1687	0.5725	608.49	134.94	743.42	95.57	51.12	596.73	cd
NexGen 2549B2RF	32.3	53.3	3351	1081	1786	0.5313	573.74	142.85	716.59	100.53	51.12	564.94	d
All-Tex Apex B2RF	28.7	51.4	3562	1021	1830	0.5612	572.82	146.40	719.21	106.85	50.70	561.66	d
FiberMax 9180B2F	32.2	52.1	3139	1009	1635	0.5695	574.51	130.82	705.33	94.15	52.12	559.05	d
Test average	33.9	50.7	3458	1170	1750	0.5613	656.76	139.96	796.72	103.74	50.86	642.12	
CV, %	3.9	4.6	3.7	3.7	3.6	2.3	3.6	3.6	3.5	3.7	--	3.8	
OSL	<0.0001	0.0200	<0.0001	<0.0001	<0.0001	0.0250	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	
LSD	2.3	4.0	214	73	106	0.0219	40.01	8.50	46.94	6.42	--	41.61	

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:
$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 nematode cotton variety demonstration, Gregory Upton Farm, 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
All-Tex Apex B2RF	3.9	35.7	80.7	28.6	10.9	2.0	83.4	8.0	1.3	1.0
Dyna-Gro 2570B2RF	4.6	35.3	82.0	30.0	11.7	1.3	82.8	8.2	1.0	1.0
Deltapine 0924B2RF	4.2	35.2	81.9	30.6	11.0	1.7	82.8	8.1	1.3	1.0
Deltapine 0935B2RF	4.3	34.5	80.7	29.0	10.8	1.0	82.7	8.4	1.0	1.0
Deltapine 174RF	4.1	35.9	81.5	29.0	11.0	2.7	82.5	8.0	1.7	1.0
FiberMax 1740B2F	4.5	34.1	80.8	30.0	10.3	1.3	83.8	7.7	1.0	1.0
FiberMax 9160B2F	4.2	36.6	82.5	31.8	8.8	2.3	84.0	7.6	1.7	1.0
FiberMax 9180B2F	4.2	36.5	82.5	32.3	9.3	2.7	84.2	7.1	2.0	1.0
NexGen 2549B2RF	4.3	33.1	81.8	29.6	11.2	2.0	82.0	7.9	1.7	1.0
NexGen 3348B2RF	4.3	35.8	82.2	31.5	10.0	2.0	81.6	7.6	2.3	1.0
PhytoGen 375WRF	4.3	35.3	81.6	29.4	10.4	2.0	82.7	8.0	1.7	1.0
Stoneville 5458B2F	4.1	35.1	81.1	31.6	10.0	3.0	80.9	8.6	2.0	1.0
Test average	4.3	35.3	81.6	30.3	10.5	2.0	82.8	7.9	1.6	1.0
CV, %	5.5	1.6	0.9	2.1	3.8	43.7	0.8	3.0	--	--
OSL	0.1474	<0.0001	0.0471	<0.0001	<0.0001	0.2300	0.0001	<0.0001	--	--
LSD	NS	1.0	1.3	1.1	0.7	NS	1.1	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.

AgriLIFE EXTENSION
Texas A&M System

Replicated LESA Irrigated Cotton Variety Demonstration Under Verticillium Wilt Pressure, Seminole, TX - 2009

Cooperator: Max McGuire

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Gaines County

Summary: Significant differences were observed for most yield and economic and HVI fiber quality parameters measured. Lint yields varied from a low of 1153 lb/acre (FiberMax 9180B2F) to a high of 1637 lb/acre (Deltapine 174RF). Lint loan values ranged from a low of $0.5327/lb (NexGen 2549B2RF) to a high of $0.5643/lb (Deltapine 174RF). Net value/acre among varieties ranged from a high of $896.76 (Deltapine 174RF) to a low of $616.91 (NexGen 2549B2RF), a difference of $279.85. Staple averaged 36.4 across all varieties with a low of 34.1 for NexGen 2549B2RF and a high of 37.7 for FiberMax 9170B2F. Strength values averaged 30.2 g/tex with a high of 32.3 g/tex for FiberMax 9170B2F and a low of 28.2 g/tex for Americot 1532B2RF. Uniformity values ranged from a high of 82.8% for FiberMax 9160B2F to a low of 80.3% for Deltapine 0935B2RF. 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 Verticillium Wilt pressure in Gaines County.

Materials and Methods:

Varieties: All-Tex Patriot+ RF, Americot 1532B2RF, Deltapine 174RF, Deltapine 164B2RF, Deltapine 0935B2RF, FiberMax 9160B2F, FiberMax 9170B2F, FiberMax 9180B2F, NexGen 2549B2RF, NexGen 3348B2RF, PhytoGen 315RF

Experimental design: Randomized complete block with 3 replications

Seeding rate:	3.6 seeds/row-ft in 40-inch row spacing
Plot size:	8 rows by variable length of field (0.91 acres to 1.48 acres)
Planting date:	29-April in terminated wheat
Irrigation:	This location was under LESA a center pivot
Insecticides:	Applied Temik at 3.5 lbs/acre infurrow at planting.
Harvest:	Plots were harvested on 8 & 9-October 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 (3.6 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 most yield and economic and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout were significant at the 0.10 probability level and ranged from a low of 30.8% and a high of 35.3% for FiberMax 9180B2F and PhytoGen 315RF, respectively. There was no significant difference in seed turnout. Bur cotton yields averaged 3850 lb/acre with a high of 4801 lb/acre for Deltapine 174RF, and a low of 3623 lb/acre for PhytoGen 315RF. Lint yields varied from a low of 1153 lb/acre (FiberMax 9180B2F) to a high of 1637 lb/acre (Deltapine 174RF). Lint loan values ranged from a low of $0.5327/lb (NexGen 2549B2RF) to a high of $0.5643/lb (Deltapine 174RF). After adding lint and seed value, total value/acre for varieties ranged from a low of $794.35 for

NexGen 2549B2RF to a high of $1093.90 for Deltapine 174RF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $896.76 (Deltapine 174RF) to a low of $616.91 (NexGen 2549B2RF), a difference of $279.85.

Micronaire values were significant at the 0.10 probability level and ranged from a low of 3.7 for NexGen 2549B2RF and NexGen 3348B2RF to a high of 4.3 for Deltapine 164B2RF. Staple averaged 36.4 across all varieties with a low of 34.1 for NexGen 2549B2RF and a high of 37.7 for FiberMax 9170B2F. Uniformity values ranged from a high of 82.8% for FiberMax 9160B2F to a low of 80.3% for Deltapine 0935B2RF. Strength values averaged 30.2 g/tex with a high of 32.3 g/tex for FiberMax 9170B2F and a low of 28.2 g/tex for Americot 1532B2RF. Elongation ranged from a high of 8.9% for NexGen 2549B2RF to a low of 6.6% for FiberMax 9160B2F. Although there was one 4 observed, leaf grades were 1s and 2s for most varieties. Values for reflectance (Rd) and yellowness (+b) averaged 81.9 and 8.0, 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:

Appreciation is expressed to Max McGuire for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

Disclaimer Clause:

Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Table 1. Harvest results from the replicated LESA irrigated cotton variety demonstration under Verticillium wilt pressure, Max McGuire Farm, 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 ----------						
Deltapine 174RF	34.1	44.6	4801	1637	2141	0.5643	922.64	171.27	1093.90	144.02	53.12	896.76	a
Deltapine 164B2RF	31.9	47.7	4050	1292	1933	0.5740	741.88	154.65	896.53	121.50	61.40	713.63	b
FiberMax 9170B2F	33.9	48.1	3830	1298	1840	0.5692	739.60	147.21	886.81	114.89	62.98	708.93	b
PhytoGen 315RF	35.3	48.7	3623	1280	1765	0.5632	721.16	141.17	862.32	108.68	53.10	700.55	bc
FiberMax 9160B2F	33.4	47.8	3655	1221	1747	0.5748	702.02	139.73	841.74	109.64	62.98	669.12	bcd
All-Tex Patriot+ RF	31.8	50.5	3728	1187	1882	0.5727	679.80	150.57	830.37	111.84	51.46	667.07	bcd
Americot 1532B2RF	32.4	48.7	3656	1186	1780	0.5710	677.06	142.35	819.42	109.68	61.77	647.97	bcd
NexGen 3348B2RF	31.6	48.9	3739	1183	1831	0.5640	667.71	146.50	814.21	112.16	61.77	640.28	bcd
Deltapine 0935B2RF	33.4	45.9	3665	1223	1683	0.5512	674.54	134.61	809.15	109.95	62.49	636.71	bcd
FiberMax 9180B2F	30.8	48.4	3746	1153	1811	0.5737	661.12	144.90	806.01	112.37	62.98	630.66	cd
NexGen 2549B2RF	31.4	48.8	3856	1209	1881	0.5327	643.92	150.43	794.35	115.67	61.77	616.91	d
Test average	32.7	48.0	3850	1261	1845	0.5646	711.95	147.58	859.53	115.49	59.62	684.42	
CV, %	5.3	5.5	5.3	5.4	5.3	1.6	6.2	5.3	6.0	5.3	--	6.6	
OSL	0.0964†	0.4278	<0.0001	<0.0001	0.0018	0.0004	<0.0001	0.0018	<0.0001	<0.0001	--	<0.0001	
LSD	2.4	NS	350	116	166	0.0155	74.72	13.30	87.68	10.51	--	77.48	

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, † indicates significance at the 0.10 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 LESA irrigated cotton variety demonstration under Verticillium wilt pressure, Max McGuire Farm, 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
All-Tex Patriot+ RF	4.1	36.5	81.6	29.6	8.6	1.3	81.7	8.2	2.0	1.0
Americot 1532B2RF	4.0	36.1	81.9	28.2	8.6	2.0	82.2	8.1	1.7	1.0
Deltapine 0935B2RF	3.8	35.0	80.3	29.0	8.5	1.7	82.3	8.4	1.3	1.0
Deltapine 164B2RF	4.3	37.2	81.9	30.3	7.3	1.0	83.3	8.2	1.0	1.0
Deltapine 174RF	4.1	37.1	82.0	30.0	7.9	2.7	81.3	8.1	2.3	1.0
FiberMax 9160B2F	4.0	37.3	82.8	31.0	6.6	2.0	82.7	7.6	1.7	1.0
FiberMax 9170B2F	3.8	37.7	81.9	32.3	6.9	1.0	83.9	7.3	2.0	1.0
FiberMax 9180B2F	4.1	37.5	82.6	31.5	7.4	1.3	82.4	7.5	2.0	1.0
NexGen 2549B2RF	3.7	34.1	82.6	29.8	8.9	4.0	79.6	8.0	2.3	1.0
NexGen 3348B2RF	3.7	36.2	82.1	30.9	7.9	2.7	80.1	7.9	2.7	1.0
PhytoGen 315RF	3.9	35.4	81.1	29.1	8.1	2.0	81.1	8.5	2.0	1.0
Test average	4.0	36.4	81.9	30.2	7.9	2.0	81.9	8.0	1.9	1.0
CV, %	5.4	1.7	0.9	2.9	5.2	37.5	1.5	3.6	--	--
OSL	0.0672†	<0.0001	0.0261	0.0005	<0.0001	0.0026	0.0143	0.0007	--	--
LSD	0.3	1.1	1.3	1.5	0.7	1.3	2.1	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, †indicates significance at the 0.10 level.

Common Variety Comparisons Across Irrigated Locations

Table 1. Lint Yield Summary Across Irrigated Locations - 2009

Entry	RACE Trials						Systems		Gaines County			
	Bailey Co.	Briscoe Co.	Crosby Co.	Dawson Co.	Floyd Co.	Hale Co.	Yoakum Co.	Crosby Co.	Seminole	Loop	Root-knot nematode	Verticillium wilt
	lb/acre											
All-Tex Apex B2RF	--	--	--	--	--	--	--	--	1250	979	1021	--
All-Tex Epic RF	1405	1384	1351	1249	955	891	766	1253	--	--	--	--
All-Tex Patriot RF	--	--	--	--	--	--	--	--	--	--	--	1187
Americot 1532B2RF	--	--	--	--	--	--	1148	--	--	--	--	1186
Croplan Genetics 3220B2RF	--	--	1271	1140	1009	830	1149	1220	--	--	--	--
Croplan Genetics 3520B2RF	1351	1282	--	--	--	--	--	--	--	--	--	--
Deltapine 0912B2RF	1543	1462	1442	--	1043	--	1155	--	--	--	--	--
Deltapine 0924B2RF	--	--	--	--	--	868	1364	1101	1281	--	1226	--
Deltapine 0935B2RF	--	--	--	1333	--	--	--	1145	1357	1018	1249	1223
Deltapine 164B2RF	--	--	--	--	--	--	--	--	--	1081	--	1292
Deltapine 174RF	--	--	--	--	--	--	--	--	1348	1183	1396	1637
Dyna-Gro 2570B2RF	--	1479	1343	1212	960	859	1260	1154	1360	1010	1310	--
FiberMax 1740B2F	--	--	--	--	--	--	1171	1303	1314	--	1131	--
FiberMax 9058F	1499	--	--	--	--	--	--	1079	--	--	--	--
FiberMax 9160B2F	--	1368	1121	1100	1123	982	1195	1223	1200	823	1077	1221
FiberMax 9170B2F	--	--	--	--	--	--	1288	--	--	928	--	1298
FiberMax 9180B2F	1415	--	--	--	1188	--	1198	1187	1149	912	1009	1153
NexGen 2549B2RF	1487	--	--	--	--	--	1307	1162	1163	866	1081	1209
NexGen 3348B2RF	--	1387	1262	974	1089	1042	1244	1154	1140	904	1063	1183
NexGen 3410RF	--	--	--	--	--	--	--	1099	--	--	--	--
PhytoGen 315RF	--	--	--	--	--	--	--	--	--	--	--	1280
PhytoGen 375WRF	1514	1494	1260	1218	999	979	1240	1162	1367	1004	1144	--
Stoneville 4288B2F	1490	1341	1296	1124	1055	974	1273	1174	--	--	--	--
Stoneville 4498B2RF	--	--	--	--	--	--	1065	--	--	--	--	--
Stoneville 5458B2RF	--	--	--	--	--	--	1111	--	--	--	1333	--
Test average	1463	1400	1293	1169	1047	928	1183	1173	1266	973	1170	1261
CV, %	2.4	3.0	3.8	6.0	4.2	4.4	8.9	4.7	2.7	9.4	3.7	5.4
OSL	0.0001	0.0002	0.0001	0.0009	0.0001	0.0001	<0.0001	0.0019	<0.0001	0.0058	<0.0001	<0.0001
LSD	62	73	87	124	76	72	176	92	59	156	73	116

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.

Table 2. Micronaire Summary Across Irrigated Locations - 2009

Entry	RACE Trials						Systems		Gaines County			
	Bailey Co.	Briscoe Co.	Crosby Co.	Dawson Co.	Floyd Co.	Hale Co.	Yoakum Co.	Crosby Co.	Seminole	Loop	Root-knot nematode	Verticillium wilt
	micronaire units											
All-Tex Apex B2RF	--	--	--	--	--	--	--	--	4.2	4.2	3.9	--
All-Tex Epic RF	2.8	3.6	3.5	4.8	2.2	2.5	2.5	3.8	--	--	--	--
All-Tex Patriot RF	--	--	--	--	--	--	--	--	--	--	--	4.1
Americot 1532B2RF	--	--	--	--	--	--	2.7	--	--	--	--	4.0
Croplan Genetics 3220B2RF	--	--	3.1	4.7	2.4	2.5	2.5	4.0	--	--	--	--
Croplan Genetics 3520B2RF	3.2	3.6	--	--	--	--	--	--	--	--	--	--
Deltapine 0912B2RF	3.5	3.9	4.0	--	2.4	--	3.1	--	--	--	--	--
Deltapine 0924B2RF	--	--	--	--	--	2.5	2.9	4.2	4.6	--	4.2	--
Deltapine 0935B2RF	--	--	--	5.0	--	--	--	4.0	4.5	4.4	4.3	3.8
Deltapine 164B2RF	--	--	--	--	--	--	--	--	--	4.4	--	4.3
Deltapine 174RF	--	--	--	--	--	--	--	--	4.1	4.0	4.1	4.1
Dyna-Gro 2570B2RF	--	3.7	3.7	4.8	2.2	2.8	2.7	4.3	4.4	4.2	4.6	--
FiberMax 1740B2F	--	--	--	--	--	--	2.9	4.3	4.4	--	4.5	--
FiberMax 9058F	3.1	--	--	--	--	--	--	4.0	--	--	--	--
FiberMax 9160B2F	--	3.4	3.0	4.2	2.2	2.5	2.7	4.2	4.0	3.7	4.2	4.0
FiberMax 9170B2F	--	--	--	--	--	--	2.7	--	--	3.8	--	3.8
FiberMax 9180B2F	3.2	--	--	--	2.5	--	3.0	4.3	4.2	3.7	4.2	4.1
NexGen 2549B2RF	3.3	--	--	--	--	--	2.8	4.2	4.0	3.2	4.3	3.7
NexGen 3348B2RF	--	3.9	3.7	3.7	2.5	2.8	3.0	4.3	4.1	3.7	4.3	3.7
NexGen 3410RF	--	--	--	--	--	--	--	3.9	--	--	--	--
PhytoGen 315RF	--	--	--	--	--	--	--	--	--	--	--	3.9
PhytoGen 375WRF	3.6	3.6	3.4	4.4	2.3	2.6	2.8	4.2	4.3	4.4	4.3	--
Stoneville 4288B2F	3.2	3.8	3.9	4.7	2.4	2.6	2.7	4.4	--	--	--	--
Stoneville 4498B2RF	--	--	--	--	--	--	2.7	--	--	--	--	--
Stoneville 5458B2RF	--	--	--	--	--	--	2.7	--	--	--	4.1	--
Test average	3.2	3.7	3.5	4.5	2.3	2.6	2.8	4.2	4.3	4.0	4.3	4.0
CV, %	8.1	4.1	7.4	4.2	3.7	11.3	--	--	4.2	5.2	5.5	5.4
OSL	0.0671†	0.0105	0.0025	<0.0001	0.0016	0.7559	--	--	0.0140	<0.0001	0.1474	0.0672†
LSD	0.4	0.3	0.5	0.3	0.1	NS	--	--	0.3	0.3	NS	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.

Table 3. Staple Summary Across Irrigated Locations - 2009

Entry	RACE Trials						Systems		Gaines County			
	Bailey Co.	Briscoe Co.	Crosby Co.	Dawson Co.	Floyd Co.	Hale Co.	Yoakum Co.	Crosby Co.	Seminole	Loop	Root-knot nematode	Verticillium wilt
	32 nds inches											
All-Tex Apex B2RF	--	--	--	--	--	--	--	--	35.9	35.2	35.7	--
All-Tex Epic RF	35.0	35.9	36.7	32.5	34.7	35.1	34.2	34.9	--	--	--	--
All-Tex Patriot RF	--	--	--	--	--	--	--	--	--	--	--	36.5
Americot 1532B2RF	--	--	--	--	--	--	35.5	--	--	--	--	36.1
Croplan Genetics 3220B2RF	--	--	35.6	33.9	35.6	37.5	35.2	33.6	--	--	--	--
Croplan Genetics 3520B2RF	36.3	36.1	--	--	--	--	--	--	--	--	--	--
Deltapine 0912B2RF	35.4	35.0	36.7	--	34.2	--	34.2	--	--	--	--	--
Deltapine 0924B2RF	--	--	--	--	--	36.0	34.3	34.5	34.7	--	35.2	--
Deltapine 0935B2RF	--	--	--	31.5	--	--	--	36.0	34.2	33.7	34.5	35.0
Deltapine 164B2RF	--	--	--	--	--	--	--	--	--	35.6	--	37.2
Deltapine 174RF	--	--	--	--	--	--	--	--	36.0	35.6	35.9	37.1
Dyna-Gro 2570B2RF	--	36.1	36.7	33.6	35.1	35.0	34.5	35.1	35.0	34.5	35.3	--
FiberMax 1740B2F	--	--	--	--	--	--	33.9	34.8	35.3	--	34.1	--
FiberMax 9058F	36.6	--	--	--	--	--	--	36.7	--	--	--	--
FiberMax 9160B2F	--	37.1	38.0	34.6	38.5	38.7	36.0	35.8	36.5	36.4	36.6	37.3
FiberMax 9170B2F	--	--	--	--	--	--	36.1	--	--	36.1	--	37.7
FiberMax 9180B2F	36.8	--	--	--	37.7	--	35.6	36.2	36.5	36.1	36.5	37.5
NexGen 2549B2RF	35.4	--	--	--	--	--	33.1	33.8	34.5	33.0	33.1	34.1
NexGen 3348B2RF	--	35.7	37.6	35.4	36.2	36.9	35.4	36.0	36.3	35.9	35.8	36.2
NexGen 3410RF	--	--	--	--	--	--	--	37.0	--	--	--	--
PhytoGen 315RF	--	--	--	--	--	--	--	--	--	--	--	35.4
PhytoGen 375WRF	35.2	35.4	36.8	33.3	35.1	36.4	34.0	34.7	35.0	34.7	35.3	--
Stoneville 4288B2F	35.7	36.6	37.9	34.6	35.5	36.4	35.2	35.3	--	--	--	--
Stoneville 4498B2RF	--	--	--	--	--	--	35.1	--	--	--	--	--
Stoneville 5458B2RF	--	--	--	--	--	--	35.0	--	--	--	35.1	--
Test average	35.8	36.0	37.0	33.7	35.8	36.5	34.8	35.3	35.4	35.2	35.3	36.4
CV, %	2.9	2.0	2.2	1.9	2.1	3.2	--	--	1.8	1.9	1.6	1.7
OSL	0.3374	0.0699†	0.0470	<0.0001	<0.0001	0.0284	--	--	0.0011	<0.0001	<0.0001	<0.0001
LSD	NS	1.0	1.4	1.1	1.3	2.1	--	--	1.1	1.1	1.0	1.1

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.

Table 4. Uniformity Summary Across Irrigated Locations - 2009

Entry	RACE Trials						Systems		Gaines County			
	Bailey Co.	Briscoe Co.	Crosby Co.	Dawson Co.	Floyd Co.	Hale Co.	Yoakum Co.	Crosby Co.	Seminole	Loop	Root-knot nematode	Verticillium wilt
	%											
All-Tex Apex B2RF	--	--	--	--	--	--	--	--	81.5	80.4	80.7	--
All-Tex Epic RF	80.9	81.1	82.1	79.5	78.0	79.8	78.2	81.3	--	--	--	--
All-Tex Patriot RF	--	--	--	--	--	--	--	--	--	--	--	81.6
Americot 1532B2RF	--	--	--	--	--	--	78.4	--	--	--	--	81.9
Croplan Genetics 3220B2RF	--	--	79.5	78.9	79.0	80.5	79.8	80.0	--	--	--	--
Croplan Genetics 3520B2RF	81.9	81.0	--	--	--	--	--	--	--	--	--	--
Deltapine 0912B2RF	81.4	81.2	82.7	--	78.6	--	79.0	--	--	--	--	--
Deltapine 0924B2RF	--	--	--	--	--	80.6	79.1	81.2	81.5	--	81.9	--
Deltapine 0935B2RF	--	--	--	79.3	--	--	--	81.7	81.0	80.1	80.7	80.3
Deltapine 164B2RF	--	--	--	--	--	--	--	--	--	80.8	--	81.9
Deltapine 174RF	--	--	--	--	--	--	--	--	81.4	80.3	81.5	82.0
Dyna-Gro 2570B2RF	--	81.6	82.0	80.3	78.9	79.1	78.4	81.7	81.0	80.9	82.0	--
FiberMax 1740B2F	--	--	--	--	--	--	78.2	80.7	80.8	--	80.8	--
FiberMax 9058F	81.0	--	--	--	--	--	--	80.6	--	--	--	--
FiberMax 9160B2F	--	81.6	83.0	80.6	81.8	82.5	80.0	81.4	80.7	81.3	82.5	82.8
FiberMax 9170B2F	--	--	--	--	--	--	78.8	--	--	80.8	--	81.9
FiberMax 9180B2F	81.7	--	--	--	81.2	--	79.9	81.1	82.2	81.1	82.5	82.6
NexGen 2549B2RF	82.2	--	--	--	--	--	80.2	81.5	81.8	80.6	81.8	82.6
NexGen 3348B2RF	--	82.5	84.2	81.5	81.5	82.1	80.4	82.3	82.5	81.3	82.2	82.1
NexGen 3410RF	--	--	--	--	--	--	--	81.6	--	--	--	--
PhytoGen 315RF	--	--	--	--	--	--	--	--	--	--	--	81.1
PhytoGen 375WRF	81.9	81.7	81.5	79.0	78.8	80.4	77.8	80.7	80.7	81.1	81.6	--
Stoneville 4288B2F	81.2	81.7	82.8	79.9	79.0	79.8	78.4	81.0	--	--	--	--
Stoneville 4498B2RF	--	--	--	--	--	--	79.5	--	--	--	--	--
Stoneville 5458B2RF	--	--	--	--	--	--	78.0	--	--	--	81.1	--
Test average	81.5	81.5	82.2	79.9	79.6	80.6	79.0	81.2	81.4	80.8	81.6	81.9
CV, %	0.8	1.3	1.8	1.0	1.3	1.2	--	--	0.6	0.7	0.9	0.9
OSL	0.2579	0.7556	0.0573†	0.0156	0.0012	0.0093	--	--	0.0011	0.2297	0.0471	0.0261
LSD	NS	NS	2.1	1.4	1.7	1.7	--	--	0.8	NS	1.3	1.3

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.

Table 5. Strength Summary Across Irrigated Locations - 2009

Entry	RACE Trials						Systems		Gaines County			
	Bailey Co.	Briscoe Co.	Crosby Co.	Dawson Co.	Floyd Co.	Hale Co.	Yoakum Co.	Crosby Co.	Seminole	Loop	Root-knot nematode	Verticillium wilt
	g/tex											
All-Tex Apex B2RF	--	--	--	--	--	--	--	--	28.8	26.8	28.6	--
All-Tex Epic RF	29.5	27.7	27.7	26.9	26.6	27.7	26.4	29.3	--	--	--	--
All-Tex Patriot RF	--	--	--	--	--	--	--	--	--	--	--	29.6
Americot 1532B2RF	--	--	--	--	--	--	26.0	--	--	--	--	28.2
Croplan Genetics 3220B2RF	--	--	27.0	27.9	26.8	28.2	28.2	28.0	--	--	--	--
Croplan Genetics 3520B2RF	29.6	25.9	--	--	--	--	--	--	--	--	--	--
Deltapine 0912B2RF	31.3	27.2	29.2	--	25.5	--	27.2	--	--	--	--	--
Deltapine 0924B2RF	--	--	--	--	--	28.2	27.3	29.0	29.0	--	30.6	--
Deltapine 0935B2RF	--	--	--	26.1	--	--	--	30.5	27.8	28.0	29.0	29.0
Deltapine 164B2RF	--	--	--	--	--	--	--	--	--	29.3	--	30.3
Deltapine 174RF	--	--	--	--	--	--	--	--	28.1	28.1	29.0	30.0
Dyna-Gro 2570B2RF	--	28.3	28.3	28.2	26.7	27.6	27.1	29.8	28.7	29.3	30.0	--
FiberMax 1740B2F	--	--	--	--	--	--	27.4	29.4	29.2	--	30.0	--
FiberMax 9058F	31.7	--	--	--	--	--	--	29.7	--	--	--	--
FiberMax 9160B2F	--	28.4	29.8	29.4	30.5	31.0	28.5	29.4	29.1	30.3	31.8	31.0
FiberMax 9170B2F	--	--	--	--	--	--	28.3	--	--	30.9	--	32.3
FiberMax 9180B2F	33.3	--	--	--	31.3	--	28.9	30.9	31.2	31.0	32.3	31.5
NexGen 2549B2RF	31.9	--	--	--	--	--	27.8	29.2	29.9	29.7	29.6	29.8
NexGen 3348B2RF	--	29.0	30.3	30.1	29.9	30.8	28.9	30.6	30.6	29.3	31.5	30.9
NexGen 3410RF	--	--	--	--	--	--	--	31.5	--	--	--	--
PhytoGen 315RF	--	--	--	--	--	--	--	--	--	--	--	29.1
PhytoGen 375WRF	29.5	27.4	27.3	26.6	25.6	27.3	26.2	28.7	28.2	28.0	29.4	--
Stoneville 4288B2F	30.9	28.8	29.4	27.9	27.3	27.6	28.2	29.3	--	--	--	--
Stoneville 4498B2RF	--	--	--	--	--	--	28.0	--	--	--	--	--
Stoneville 5458B2RF	--	--	--	--	--	--	28.2	--	--	--	31.6	--
Test average	31.0	27.8	28.6	27.9	27.8	28.5	27.7	29.7	29.1	29.2	30.3	30.2
CV, %	2.8	3.8	3.0	2.5	3.7	4.7	--	--	2.7	1.9	2.1	2.9
OSL	0.0006	0.0479	0.0023	<0.0001	<0.0001	0.0181	--	--	0.0007	<0.0001	<0.0001	0.0005
LSD	1.5	1.8	1.5	1.2	1.8	2.3	--	--	1.3	0.9	1.1	1.5

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level.

Additional Replicated Dryland Large Plot Demonstrations

AgriLIFE EXTENSION
Texas A&M System

Replicated Dryland Cotton Variety Demonstration, AGCARES, Lamesa, TX - 2009

Cooperators: Lamesa Cotton Growers/Texas AgriLife Research/ Texas AgriLife Extension

Jeff Wyatt, Tommy Doederlein, Randy Boman, Mark Kelley and Chris Ashbrook
CEA-ANR Dawson County, EA-IPM Dawson/Lynn Counties, Extension Agronomist - Cotton, Extension Program Specialist II - Cotton, and Extension Assistant - Cotton

Dawson County

Summary: Agronomic data including plant population and nodes above white flower (NAWF) are included in Table 1. No significant differences among varieties were observed for plant population with a test average of 26,790 plants/acre. Weekly NAWF counts were taken beginning 13-July to 10-August. Significant differences among varieties were observed for the 20-July observation only and values ranged from a low of 5.3 for Deltapine 0949B2RF to a high of 6.4 for All-Tex Epic RF.

Significant differences were noted for most yield and some fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from 37.0 for Deltapine 0949B2RF to 29.8% for NexGen 3410RF. Lint yields varied from a low of 361 lb/acre (NexGen 3410RF) to a high of 550 lb/acre (All-Tex Epic RF). No significant differences were noted in lint loan values which averaged $0.4798/lb. When subtracting ginning, seed costs and technology fees, the net value/acre among varieties ranged from a high of $228.08 (All-Tex Epic RF) to a low of $128.16 (NexGen 3410RF), a difference of $99.92. No significant differences were observed for micronaire (3.9 average), staple (31.8 average), uniformity (77.8% average), or strength (25.0 g/tex average). Significant differences were observed among varieties for percent elongation (9.5 avg), leaf grade (2.4 avg), Rd or reflectance (79.0 avg) and +b or yellowness (7.8). These data indicate that substantial differences can be obtained in terms of net value/acre due to variety 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 dryland production in the Texas High Plains.

Materials and Methods:

Varieties: All-Tex Epic RF, Croplan Genetics 3035RF, Deltapine 0949B2RF, FiberMax 9058F, FiberMax 9160B2F, NexGen 3410RF, PhytoGen 375WRF, and Stoneville 4288B2F

Experimental design: Randomized complete block with 3 replications

Seeding rate: 4 seeds/row-ft in solid planted 40-inch row spacing (John Deere MaxEmerge vacuum planter)

Plot size: 4 rows by length of field (~850 ft)

Planting date: 21-May

Weed management: Trifluralin was applied preplant incorporated at 1 pt/acre across all varieties on 15-April. Roundup PowerMax was applied over-the-top on 16-June at 32 oz/acre with AMS. Two cultivation events were conducted at this location.

Rainfall:

April:	0.01"	August:	0.01"
May:	1.25"	September:	0.35"
June:	1.79"	October:	0.76"
July:	1.22"		

Total rainfall: 5.39"

Insecticides: This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.

Fertilizer: Applied 40 lbs N/acre using 32-0-0 on 9-March.

Harvest aids: Harvest aids included 21 oz/acre Prep + 1.5 oz/acre ET with 1% v/v crop oil on 25-September followed by 24 oz/acre Gramoxone Inteon with 0.25% v/v NIS on 2-October.

Harvest: Plots were harvested on 3-November using a commercial John Deere 7445 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 AgriLife Research and Extension Center at Lubbock to determine gin turnouts.

Fiber analysis: Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University 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 costs and technology fees were determined by variety on a per acre basis based on 4.0 seed/row-ft in 40-inch rows using the Plains Cotton Growers Seed Cost Calculator found at: http://www.plainscotton.org/Seed/PCGseed10.xls

Results and Discussion:

Weed pressure at this site would generally be considered light to medium and consisted mainly of silverleaf nightshade, pigweed, morningglory spp. "escapes", and puncturevine. Hot, dry conditions during and after planting resulted in significant stress on the trial.

Agronomic data including plant population and nodes above white flower (NAWF) are included in Table 1. Stand counts taken on 15-June indicated no significant differences among varieties with a test average of 26,790 plants/acre. Stand counts ranged from a high of 30,405 plants/acre for PhytoGen 375WRF to a low of 24,045 for All-Tex Epic RF. Weekly NAWF counts were taken beginning 13-July to 10-August. Averages were 6.9 (13-July), 6.0 (20-July), 5.3 (27-July), 3.9 (3-August), and 2.4 (10-August). Significant differences among varieties were observed for the 20-July observation only (alpha=0.10) and values ranged from a low of 5.3 for Deltapine 0949B2RF to a high of 6.4 for All-Tex Epic RF.

Significant differences were noted for most yield and some fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from 37.0% for Deltapine 0949B2RF to 29.8% for NexGen 3410RF. Lint yields varied from a low of 361 lb/acre (NexGen 3410RF) to a high of 550 lb/acre (All-Tex Epic RF). No significant differences were noted in lint loan values which averaged $0.4798/lb. After adding lint and seed value, total value/acre ranged from a low of $221.22 for NexGen 3410RF, to a high of $330.06 for All-Tex Epic RF. When subtracting ginning, seed costs and technology fees, the net value/acre among varieties ranged from a high of $228.08 (All-Tex Epic RF) to a low of $128.16 (NexGen 3410RF), a difference of $99.92. No significant differences were observed for micronaire (3.9 average), staple (31.8 average), uniformity (77.8% average), or strength (25.0 g/tex average). Significant differences were observed among varieties for percent elongation (9.5 avg), leaf grade (2.4 avg), Rd or reflectance (79.0 avg) and +b or yellowness (7.8). These data indicate that substantial differences can be obtained in terms of net value/acre due to variety selection. Additional multi-site and multi-year applied research is needed to evaluate varieties across a series of environments.

Acknowledgments:

Appreciation is expressed to Danny Carmichael for his cooperation and assistance with this demonstration. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

Disclaimer Clause:

Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Table 1. Plant stand and NAWF results from the replicated dryland RACE variety demonstration, AG-CARES Farm, Lamesa, TX, 2009.

	Plant Population 15-Jun		Nodes Above White Flower (NAWF) for Week of				
Entry	plants/row ft	plants/acre	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug
All-Tex Epic RF	1.8	24,045	7.1	6.4	5.7	3.8	2.6
Croplan Genetics 3035RF	2.1	27,704	7.3	6.3	5.2	4.0	2.5
Deltapine 0949B2RF	2.0	25,701	6.6	5.3	5.3	4.2	2.5
FiberMax 9058F	1.8	24,132	6.7	6.1	5.2	4.0	2.1
FiberMax 9160B2F	2.0	26,397	6.3	6.1	5.4	3.9	2.2
NexGen 3410RF	2.3	29,447	7.1	5.8	4.5	3.1	1.9
PhytoGen 375WRF	2.3	30,405	7.1	6.1	5.7	4.1	2.7
Stoneville 4288B2F	2.0	26,485	7.2	6.1	5.2	4.1	2.5
Test average	2.0	26,790	6.9	6.0	5.3	3.9	2.4
CV, %	14.9	14.6	6.6	5.8	9.3	14.4	17.3
OSL	0.4388	0.4466	0.2021	0.0624†	0.1968	0.4057	0.2606
LSD 0.10	NS	NS	NS	0.5	NS	NS	NS

NAWF numbers represent an average of 10 plants per rep per variety for a total of 30 plants per variety.
CV - coefficient of variation, percent.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level, †denotes significance at the 0.10 level, NS - not significant.

Table 2. Harvest results from the replicated dryland RACE variety demonstration, AG-CARES Farm, Lamesa, 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 ----------						
All-Tex Epic RF	36.5	51.9	1505	550	782	0.4868	267.53	62.53	330.06	45.16	56.82	228.08	a
Croplan Genetics 3035RF	36.1	49.2	1369	494	674	0.4897	241.94	53.93	295.87	41.08	58.39	196.39	b
FiberMax 9058F	33.9	53.1	1307	443	694	0.4783	211.70	55.56	267.25	39.21	60.38	167.66	c
PhytoGen 375WRF	36.1	51.9	1226	442	636	0.4818	213.10	50.88	263.98	36.78	67.72	159.49	cd
FiberMax 9160B2F	35.5	51.7	1186	421	613	0.4798	201.93	49.02	250.96	35.57	69.54	145.85	cde
Stoneville 4288B2F	31.5	53.7	1306	411	701	0.4807	197.45	56.11	253.56	39.18	69.54	144.84	cde
Deltapine 0949B2RF	37.0	50.7	1116	413	565	0.4758	196.58	45.21	241.79	33.47	68.99	139.32	de
NexGen 3410RF	29.8	55.1	1209	361	666	0.4657	167.95	53.27	221.22	36.26	56.80	128.16	e
Test average	34.5	52.2	1278	442	666	0.4798	212.27	53.31	265.58	38.34	63.52	163.72	
CV, %	3.4	3.4	6.6	6.8	6.6	5.4	6.8	6.5	6.7	6.6	--	9.4	
OSL	<0.0001	0.0304	0.0017	<0.0001	0.0014	0.9700	<0.0001	0.0014	0.0001	0.0017	--	<0.0001	
LSD	2.1	3.1	147	52	77	NS	25.28	6.11	31.31	4.41	--	26.93	

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 3. HVI fiber property results from the replicated dryland RACE variety demonstration, AG-CARES Farm, Lamesa, 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
All-Tex Epic RF	4.2	30.8	78.5	25.3	11.0	1.7	78.4	8.3	3.0	1.0
Croplan Genetics 3035RF	4.1	31.4	78.7	26.1	10.9	2.0	78.7	8.2	2.7	1.0
Deltapine 0949B2RF	4.0	31.8	77.9	25.8	10.0	2.7	79.3	7.7	3.0	1.0
FiberMax 9058F	3.6	32.5	77.4	25.2	7.9	3.3	80.3	7.2	3.0	1.0
FiberMax 9160B2F	3.7	31.5	77.7	24.5	8.2	2.0	80.2	7.7	3.0	1.0
NexGen 3410RF	3.5	32.7	77.4	25.2	9.3	4.0	78.0	7.9	3.0	1.0
PhytoGen 375WRF	4.0	31.5	77.3	23.5	9.2	1.3	78.3	7.5	3.0	1.0
Stoneville 4288B2F	4.0	31.9	77.7	24.4	9.4	2.0	78.8	7.8	3.0	1.0
Test average	3.9	31.8	77.8	25.0	9.5	2.4	79.0	7.8	3.0	1.0
CV, %	10.7	3.3	1.6	5.7	3.9	26.2	0.4	3.7	--	--
OSL	0.3555	0.4150	0.7717	0.4786	<0.0001	0.0018	<0.0001	0.0054	--	--
LSD	NS	NS	NS	NS	0.6	1.1	0.6	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 - not significant.

AgriLIFE EXTENSION
Texas A&M System

Replicated Dryland Skip-Row Cotton Variety Demonstration, Littlefield, TX - 2009

Cooperator: Greg White

Todd Beyers, Emilio Niňo, Randy Boman, Mark Kelley and Chris Ashbrook
CEA-ANR Lamb County, EA-IPM Lamb/Castro Counties,
Extension Agronomist - Cotton, Extension Program Specialist II - Cotton, and Extension Assistant - Cotton

Lamb County

Summary: **This location was planted to a 2x1 skip-row planting pattern in 40-inch row spacings, however, all data are reported on a land-acre basis**. Significant differences were noted for most yield and HVI fiber quality parameters measured. There were no significant differences among varieties for lint turnout which averaged 26.1%. Lint yields varied from a low of 297 lb/acre (Deltapine 0935B2RF) to a high of 355 lb/acre (Stoneville 4288B2F). Lint loan values ranged from a low of $0.3958/lb to a high of $0.4650/lb for All-Tex Epic RF and FiberMax 9160B2F, respectively. After subtracting ginning and seed and technology fee costs, the net value/acre among varieties ranged from a high of $139.50 for NexGen 3410RF to a low of $101.37 for Deltapine 0935B2RF, a difference of $38.13. Micronaire values ranged from a low of 2.2 for Dyna-Gro 2570B2RF to a high of 2.5 for Stoneville 4288B2F. Staple averaged 34.3 across all varieties with a low of 33.2 (All-Tex Epic RF) and a high of 35.5 (FiberMax 9160B2F). Uniformity ranged from a low of 78.3% for Stoneville 4288B2F to a high of 79.9% for FiberMax 9160B2F, and strength ranged from a low of 23.5 g/tex for PhytoGen 375WRF to a high of 27.2 g/tex for NexGen 3410RF. These data indicate that substantial differences can be obtained in terms of net value/acre due to variety 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 dryland skip-row production in the Texas High Plains.

Materials and Methods:

Varieties: All-Tex Epic RF, Croplan Genetics 3520B2RF, Deltapine 0935B2RF, Dyna-Gro 2570B2RF, FiberMax 9160B2F, NexGen 3410RF, PhytoGen 375WRF, and Stoneville 4288B2F

Experimental design: Randomized complete block with 3 replications

Seeding rate: 2.8 seed/ft down the row in 2x1 skip-row planted 40-inch row spacing (John Deere 7300 MaxEmerge vacuum planter). This is equivalent to 24,333 seed/land acre.

Plot size: 9 rows (6 planted) by length of field (2677 ft)

Planting date: 29-May

Weed management: Trifluralin was applied preplant incorporated at 1.3 pt/acre across all varieties in early March. Roundup PowerMax was applied over-the-top on 8-July at 32 oz/acre with ammonium sulfate and LI 700. One cultivation was conducted on 25-August.

Rainfall: Based on the nearest Texas Tech University - West Texas Mesonet Station at Anton, the following precipitation amounts were recorded:

April:	1.18"	July:	2.30"
May:	0.93"	August:	0.33"
June:	6.69"	September:	0.70"

Total rainfall: 12.13"

The producer reported 5.8 inches of rainfall accumulation on site from 4-June to end of July. This does not include rainfall amounts for April and May or from first of August to end of September rainfall.

Insecticides: No insecticides were applied at this location by producer. This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.

Harvest aids: No harvest aids were utilized at this location.

Harvest: Plots were harvested on 17-November using a commercial John Deere 7455 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 basis.

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 Fiber and Biopolymer Research Institute at Texas Tech University 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 on a per land acre basis using the appropriate seeding rate (2.8 seed/row-ft) for the 40-inch row spacing in 2X1 skip-row planting pattern (or 24,333 seed per land acre) and entries using the online Plains Cotton Growers Seed Cost Comparison Worksheet available at: http://www.plainscotton.org/Seed/PCGseed10.xls .

Results and Discussion:

This location was planted to a 2x1 skip-row planting pattern in 40-inch row spacings, however, all data are reported on a land-acre basis. No stand counts or plant measurement data were collected due to poor stand establishment. Significant differences were noted for most yield and HVI fiber quality parameters measured (Tables 1 and 2). There were no significant differences among varieties for lint turnout which averaged 26.1%. Bur cotton yield averaged 1253 lb/acre across all varieties and ranged from 1149 lb/acre for Deltapine 0935B2RF to 1352 lb/acre for Stoneville 4288B2RF. Lint yields varied from a low of 297 lb/acre (Deltapine 0935B2RF) to a high of 355 lb/acre (Stoneville 4288B2RF). Lint loan values ranged from a low of $0.3958/lb to a high of $0.4650/lb for All-Tex Epic RF and FiberMax 9160B2F, respectively. After adding lint and seed value, total value/acre ranged from a low of $167.94 for Deltapine 0935B2RF, to a high of $205.31 for NexGen 3410RF. When subtracting ginning and seed and technology fee costs, the net value/acre among varieties ranged from a high of $139.50 for NexGen 3410RF to a low of $101.37 for Deltapine 0935B2RF, a difference of $38.13.

Micronaire values ranged from a low of 2.2 for Dyna-Gro 2570B2RF to a high of 2.5 for Stoneville 4288B2F. Staple averaged 34.3 across all varieties with a low of 33.2 (All-Tex Epic RF) and a high of 35.5 (FiberMax 9160B2F). Uniformity ranged from a low of 78.3% for Stoneville 4288B2F to a high of 79.9% for FiberMax 9160B2F, and strength ranged from a low of 23.5 g/tex for PhytoGen 375WRF to a high of 27.2 g/tex for NexGen 3410RF. Elongation ranged from a high of 10.8% for Croplan Genetics 3520B2RF to a low of 8.9% for FiberMax 9160B2F. Leaf grades were mostly 1s and 2s at this location. Values for reflectance (Rd) and yellowness (+b) averaged 78.2 and 10.8, respectively. This resulted in color grades of mostly 11 and 12 across varieties.

These data indicate that substantial differences can be obtained in terms of net value/acre due to variety selection. 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 across a series of environments.

Acknowledgments:

Appreciation is expressed to Greg White for the use of his land, labor and equipment for this demonstration. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

Disclaimer Clause:

Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Table 1. Harvest results from the replicated dryland 2x1 skip-row RACE variety demonstration, Greg White Farm, Littlefield, 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 ----------						
NexGen 3410RF	26.3	51.8	1313	345	680	0.4378	150.94	54.38	205.31	39.39	26.43	139.50	a
FiberMax 9160B2F	26.1	49.6	1219	317	604	0.4650	147.67	48.33	196.00	36.56	32.35	127.09	b
All-Tex Epic RF	27.6	50.8	1266	349	643	0.3958	138.43	51.46	189.88	37.98	26.43	125.47	bc
Stoneville 4288B2F	26.3	49.2	1352	355	665	0.4070	144.70	53.23	197.93	40.56	32.35	125.02	bc
Croplan Genetics 3520B2RF	24.3	50.7	1259	306	638	0.4502	137.76	51.06	188.82	37.77	31.41	119.64	cd
Dyna-Gro 2570B2RF	26.0	50.0	1230	319	615	0.4212	134.53	49.16	183.70	36.91	31.52	115.27	de
PhytoGen 375WRF	26.2	49.6	1233	323	612	0.4073	131.45	48.95	180.40	36.99	31.51	111.90	e
Deltapine 0935B2RF	25.8	47.5	1149	297	546	0.4190	124.30	43.65	167.94	34.48	32.10	101.37	f
Test average	26.1	49.9	1253	326	625	0.4254	138.72	50.03	188.75	37.58	30.51	120.66	
CV, %	7.9	2.7	2.7	2.7	2.7	4.2	2.7	2.7	2.7	2.7	--	3.4	
OSL	0.7806	0.0487	0.0002	<0.0001	<0.0001	0.0036	<0.0001	<0.0001	<0.0001	0.0002	--	<0.0001	
LSD	NS	2.3	59	15	30	0.0310	6.54	2.35	8.89	1.77	--	7.12	

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.
***All yield, value and cost components were detemined on a land-acre basis.**

Table 2. HVI fiber property results from the replicated dryland 2x1 skip-row RACE variety demonstration, Greg White Farm, Littlefield, 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
All-Tex Epic RF	2.3	33.2	78.5	24.4	10.4	1.0	77.0	11.5	1.0	2.3
Croplan Genetics 3520B2RF	2.3	35.0	79.6	24.6	10.8	1.3	79.6	10.1	1.0	1.0
Deltapine 0935B2RF	2.3	34.1	78.5	25.6	9.8	1.0	77.2	11.5	1.0	2.3
Dyna-Gro 2570B2RF	2.2	34.1	78.6	25.2	10.5	1.0	77.5	11.3	1.0	2.0
FiberMax 9160B2F	2.3	35.5	79.9	25.4	8.9	2.0	80.0	9.8	1.0	1.0
NexGen 3410RF	2.4	35.0	79.7	27.2	9.8	1.3	78.7	10.3	1.0	1.7
PhytoGen 375WRF	2.3	33.5	78.6	23.5	9.7	1.7	79.2	10.3	1.0	1.7
Stoneville 4288B2F	2.5	34.0	78.3	24.7	10.3	1.3	76.5	11.3	1.0	2.3
Test average	2.3	34.3	79.0	25.1	10.0	1.3	78.2	10.8	1.0	1.8
CV, %	3.8	2.3	0.9	4.7	2.9	28.9	1.3	4.0	--	--
OSL	0.0234	0.0314	0.0733†	0.0683†	<0.0001	0.0637†	0.0038	0.0006	--	--
LSD	0.2	1.4	1.0	1.7	0.5	0.6	1.8	0.7	--	--

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.05 level, †denotes significance at the 0.10 level, NS - not significant.

AgriLIFE EXTENSION
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Replicated Dryland Cotton Variety Demonstration, Lubbock, TX - 2009

Cooperator: Texas AgriLife Research, Glover Farm

Mark Brown, Randy Boman, Mark Kelley and Chris Ashbrook
CEA-ANR Lubbock County, Extension Agronomist - Cotton, Extension Program Specialist II - Cotton, and Extension Assistant - Cotton

Lubbock County

Summary: **This location was dry planted and stand establishment was weak until a rainfall event on 20-June**. Significant differences were observed for some yield and most HVI lint quality parameters measured. Differences in lint turnout of non-field cleaned bur cotton among varieties were not significant and averaged 25.8%. Lint yields varied from a low of 257 lb/acre (FiberMax 9058F) to a high of 353 lb/acre (Stoneville 4288B2F). Lint loan values averaged $0.5155/lb and were not significantly different. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $133.11 (Stoneville 4288B2F) to a low of $77.33 (PhytoGen 375WRF), a difference of $55.78. No differences were observed for micronaire which averaged 3.3. Staple averaged 34.4 across all varieties with a low of 32.9 for All-Tex Epic RF and a high of 36.0 for FiberMax 9058F. The highest uniformity was observed for FiberMax 9160B2F (81.5%) and All-Tex Epic RF had the lowest (79.4%). Strength values averaged 27.4 g/tex with a high of 29.0 g/tex for FiberMax 9058F and a low of 25.7 g/tex for PhytoGen 375WRF. 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 yields, gin turnout, fiber quality, and economic returns of transgenic cotton varieties under dryland production in the Texas High Plains.

Materials and Methods:

Varieties: All-Tex Epic RF, Croplan Genetics 3035RF, Deltapine 0949B2RF, FiberMax 9058F, FiberMax 9160B2F, NexGen 3410RF, PhytoGen 375WRF, Stoneville 4288B2F

Experimental design:	Randomized complete block with 3 replications
Seeding rate:	3.5 seeds/row-ft in 40-inch row spacing (John Deere 1700 Max-Emerge+ vacuum planter)
Plot size:	4 rows by length of field (600 ft long)
Planting date:	2-June
Weed management:	Treflan was applied pre-plant incorporated at 1.5 pt/acre. Two applications of Roundup WeatherMax were applied at 24 oz/acre with ammonium sulfate on 7-July and at 32 oz/acre on 7-August. One cultivation was conducted at this location.
Rainfall:	Based on recorded precipitation measurements from the nearest Texas Tech University - West Texas Mesonet Station at Silverton, rainfall amounts were:

April:	1.01"	July:	1.65"
May:	0.53"	August:	0.15"
June:	2.56"	September:	1.41"

Total rainfall: 7.31"

Insecticides:	No insecticides were applied at this location. This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.
Fertilizer management:	40 lbs N/acre were applied pre-plant.
Harvest aids:	32 oz/acre ethephon was applied on 9-October with a sequential application of 21 oz/a Gramoxone Inteon with 0.25% v/v NIS on 20-October.
Harvest:	Plots were harvested on 11-November using a commercial John Deere 484 stripper harvester. 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 (3.5 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:

This location was dry planted and stand establishment was weak until a rainfall event on 20-June. Significant differences were observed for some yield and most HVI lint quality parameters measured (Tables 1 and 2). Differences in lint turnout of non-field cleaned bur cotton among varieties were not significant and averaged 25.8%. Bur cotton yields averaged 1149 lb/acre and were not significantly different. Lint yields varied from a low of 257 lb/acre (FiberMax 9058F) to a high of 353 lb/acre (Stoneville 4288B2F). Lint loan values were not significantly different and averaged $0.5155/lb. After adding lint and seed value, total value/acre for varieties ranged from a low of $171.24 for PhytoGen 375WRF to a high of $232.91 for Stoneville 4288B2F. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $133.11 (Stoneville 4288B2F) to a low of $77.33 (PhytoGen 375WRF), a difference of $55.78. No differences were observed for micronaire which averaged 3.3. Staple averaged 34.4 across all varieties with a low of 32.9 for All-Tex Epic RF and a high of 36.0 for FiberMax 9058F. The highest uniformity was observed for FiberMax 9160B2F (81.5%) and All-Tex Epic RF had the lowest (79.4%). Strength values averaged 27.4 g/tex with a high of 29.0 g/tex for FiberMax 9058F and a low of 25.7 g/tex for PhytoGen 375WRF. Elongation ranged from a high of 11.8% for All-Tex Epic RF to a low of 8.7% for FiberMax 9160B2F. Leaf grades were mostly 1 and 2 at this location. Values for reflectance (Rd) and yellowness (+b) averaged 82.6 and 8.9, respectively. This resulted in color grades of mostly 11 across varieties.

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:

Appreciation is expressed to Dr. Wayne Keeling, Texas AgriLife Research for his assistance with this demonstration. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Harvest results from the replicated dryland RACE variety demonstration, Texas AgriLife Research - Glover Farm, Lubbock, 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 ----------						
Stoneville 4288B2F	27.2	45.9	1300	353	596	0.5248	185.20	47.71	232.91	38.99	60.81	133.11	a
Croplan Genetics 3035RF	27.2	43.3	1174	319	508	0.5092	162.75	40.68	203.43	35.23	51.07	117.13	ab
NexGen 3410RF	26.3	44.2	1107	292	490	0.5500	160.30	39.18	199.48	33.21	49.68	116.59	ab
Deltapine 0949B2RF	27.6	44.3	1169	322	517	0.5172	166.75	41.38	208.14	35.07	60.34	112.74	abc
All-Tex Epic RF	25.9	42.2	1109	288	468	0.4840	139.28	37.46	176.74	33.27	49.69	93.78	bcd
FiberMax 9058F	23.6	42.7	1087	257	465	0.5335	136.89	37.16	174.04	32.62	52.81	88.62	bcd
FiberMax 9160B2F	24.9	44.4	1092	272	485	0.5103	138.97	38.77	177.73	32.78	60.81	84.15	cd
PhytoGen 375WRF	23.3	40.9	1156	270	472	0.4950	133.44	37.80	171.24	34.68	59.22	77.33	d
Test average	25.8	43.5	1149	297	500	0.5155	152.95	40.02	192.96	34.48	55.55	102.93	
CV, %	8.2	4.8	10.7	10.5	10.6	4.9	10.6	10.6	10.6	10.7	--	16.2	
OSL	0.1543	0.1984	0.4853	0.0297	0.1285	0.1160	0.0138	0.1276	0.0241	0.4856	--	0.0114	
LSD	NS	NS	NS	55	NS	NS	28.26	NS	35.65	NS	--	29.24	

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 dryland RACE variety demonstration, Texas AgriLife Research - Glover Farm, Lubbock, 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
All-Tex Epic RF	3.2	32.9	79.4	26.7	11.8	1.0	81.9	9.6	1.0	1.0
Croplan Genetics 3035RF	3.4	33.5	80.0	27.2	11.1	1.7	82.1	9.3	1.0	1.0
Deltapine 0949B2RF	3.3	34.5	80.2	26.9	10.4	1.3	83.1	9.0	1.0	1.0
FiberMax 9058F	3.2	36.0	80.8	29.0	9.0	1.7	84.0	8.3	1.0	1.0
FiberMax 9160B2F	3.0	35.4	81.5	28.4	8.7	1.3	84.2	8.2	1.0	1.0
NexGen 3410RF	3.4	35.2	80.6	28.6	9.7	2.3	81.2	8.7	1.7	1.0
PhytoGen 375WRF	3.0	34.0	79.8	25.7	10.1	1.3	82.7	8.9	1.0	1.0
Stoneville 4288B2F	3.8	33.4	79.5	26.3	10.7	1.0	81.9	9.2	1.0	1.0
Test average	3.3	34.4	80.2	27.4	10.2	1.5	82.6	8.9	1.1	1.0
CV, %	11.4	2.8	0.8	2.4	5.0	25.4	0.9	2.0	--	--
OSL	0.2167	0.0133	0.0265	0.0002	<0.0001	0.0115	0.0013	<0.0001	--	--
LSD	NS	1.7	1.2	1.1	0.9	0.6	1.3	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, NS - not significant.

AgriLIFE EXTENSION
Texas A&M System

Replicated Dryland Cotton Variety Demonstration, Seminole, TX - 2009

Cooperator: Jud Cheuvront

Manda Cattaneo, Mark Kelley, Randy Boman, and Scott Russell
EA-IPM Gaines County, Extension Program Specialist II - Cotton, Extension Agronomist - Cotton, EA-IPM Terry and Yoakum Counties

Gaines County

Summary: **This location was initially LESA irrigated for stand establishment. No subsequent irrigations were applied**. Significant differences were observed for all yield, economic, and HVI fiber quality parameters measured. Lint turnout ranged from a low of 31.4% to a high of 38.5% for Deltapine 164B2RF and All-Tex Epic RF, respectively. Lint yields varied from a low of 426 lb/acre (Deltapine 164B2RF) to a high of 557 lb/acre (All-Tex Epic RF). Lint loan values ranged from a low of $0.5017/lb (FiberMax 1740B2F) to a high of $0.5683/lb (Deltapine 164B2RF). Net value/acre among varieties ranged from a high of $285.92 (All-Tex Epic RF) to a low of $209.19 (FiberMax 9180B2F), a difference of $76.73. Micronaire values ranged from a low of 4.0 for NexGen 3410RF to a high of 4.8 for FiberMax 1740B2F. Staple averaged 34.2 across all varieties with a low of 32.0 for FiberMax 1740B2F and a high of 35.4 for Deltapine 164B2RF. Uniformity ranged from a high of 81.1% for FiberMax 9160B2F to a low of 79.6% for FiberMax 1740B2F. Strength values averaged 29.1 g/tex with a high of 30.9 g/tex for FiberMax 9180B2F and a low of 27.4 g/tex for FiberMax 1740B2F and Americot 1532B2RF. 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 dryland production in Gaines County.

Materials and Methods:

Varieties: All-Tex Epic RF, Americot 1532B2RF, Deltapine 174RF, Deltapine 164B2RF, Deltapine 0924B2RF, Dyna-Gro 2570B2RF, FiberMax 1740B2F, FiberMax 9180B2F, FiberMax 9160B2F, NexGen 3348B2RF, NexGen 3410RF, PhytoGen 375WRF

Experimental design:	Randomized complete block with 3 replications
Seeding rate:	2.5 seed/row-ft in 36-inch row spacing (36,300 seed/acre)
Plot size:	6 rows by variable length of field (757 - 2243 ft long)
Planting date:	1-June
Irrigation:	This site was irrigated twice using LESA center pivot irrigation to aid in stand establishment, and no further irrigation was applied.
Insecticides:	Applied 5.0 lbs/acre Temik infurrow at planting.
Harvest:	Plots were harvested on 10-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 (2.5 seed/row-ft) for the 36-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:

This location was initially LESA irrigated for stand establishment. No subsequent irrigations were applied. Significant differences were observed for all yield, economic, and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout ranged from a low of 31.4% to a high of 38.5% for Deltapine 164B2RF and All-Tex Epic RF, respectively. Bur cotton yields averaged 1397 lb/acre with a high of 1520 lb/acre for FiberMax 1740B2F, and a low of 1320 lb/acre for PhytoGen 375WRF. Lint yields varied with a low of 426 lb/acre (Deltapine 164B2RF) and a

high of 557 lb/acre (All-Tex Epic RF). Lint loan values ranged from a low of $0.5017/lb (FiberMax 1740B2F) to a high of $0.5683/lb (Deltapine 164B2RF). After adding lint and seed value, total value/acre for varieties ranged from a low of $298.17 for FiberMax 9180B2F to a high of $368.77 for All-Tex Epic RF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $285.92 (All-Tex Epic RF) to a low of $209.19 (FiberMax 9180B2F), a difference of $76.73.

Micronaire values ranged from a low of 4.0 for NexGen 3410RF to a high of 4.8 for FiberMax 1740B2F. Staple averaged 34.2 across all varieties with a low of 32.0 for FiberMax 1740B2F and a high of 35.4 for Deltapine 164B2RF. Uniformity ranged from a high of 81.1% for FiberMax 9160B2F to a low of 79.6% for FiberMax 1740B2F. Strength values averaged 29.1 g/tex with a high of 30.9 g/tex for FiberMax 9180B2F and a low of 27.4 g/tex for FiberMax 1740B2F and Americot 1532B2RF. Elongation ranged from a high of 11.6% for Dyna-Gro 2570B2RF to a low of 9.0% for FiberMax 9160B2F. Leaf grades ranged from 1 to 3, with a test average of 1.6. Values for reflectance (Rd) and yellowness (+b) averaged 80.7 and 8.8, respectively. This resulted in color grades of mostly 11 and 21.

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:

Appreciation is expressed to Jud Cheuvront for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. Furthermore, we greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Harvest results from the replicated dryland cotton variety demonstration, Jud Cheuvront Farm, 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 ----------						
All-Tex Epic RF	38.5	54.7	1447	557	791	0.5475	305.47	63.29	368.77	43.41	39.44	285.92	a
Dyna-Gro 2570B2RF	35.1	51.5	1454	510	749	0.5408	275.99	59.94	335.93	43.61	47.02	245.30	b
FiberMax 1740B2F	36.5	49.4	1520	555	750	0.5017	278.34	60.02	338.36	45.62	48.26	244.48	bc
NexGen 3348B2RF	34.9	50.4	1448	504	730	0.5383	271.45	58.41	329.86	43.43	47.33	239.10	bcd
Deltapine 174RF	35.3	49.3	1333	471	657	0.5472	257.52	52.54	310.07	40.00	40.71	229.36	bcde
Deltapine 0924B2RF	34.1	51.0	1430	487	729	0.5348	260.35	58.34	318.69	42.89	47.89	227.91	bcde
NexGen 3410RF	33.6	50.7	1351	453	685	0.5565	252.22	54.83	307.05	40.53	39.42	227.10	bcde
FiberMax 9160B2F	34.8	50.1	1344	468	673	0.5507	258.23	53.81	312.04	40.32	48.26	223.45	cde
Americot 1532B2RF	32.8	51.8	1401	459	725	0.5543	254.29	58.03	312.32	42.04	47.33	222.94	de
PhytoGen 375WRF	36.0	49.9	1320	476	659	0.5253	249.89	52.69	302.58	39.61	47.00	215.97	e
Deltapine 164B2RF	31.4	53.5	1355	426	725	0.5683	242.32	57.96	300.28	40.65	47.05	212.58	e
FiberMax 9180B2RF	32.4	49.1	1357	440	667	0.5568	244.82	53.34	298.17	40.71	48.26	209.19	e
Test average	34.6	50.9	1397	484	712	0.5435	262.57	56.94	319.51	41.90	45.66	231.94	
CV, %	3.9	3.6	3.9	3.8	3.9	1.7	4.6	3.9	4.4	3.9	--	5.5	
OSL	0.0002	0.0250	0.0027	<0.0001	<0.0001	0.0250	0.0001	<0.0001	0.0001	0.0027	--	<0.0001	
LSD	2.3	3.1	91	31	47	0.0152	20.51	3.76	24.03	2.74	--	21.49	

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:
$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 dryland cotton variety demonstration, Jud Cheuvront Farm, 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
All-Tex Epic RF	4.5	34.3	80.6	29.3	11.0	1.0	80.9	9.3	1.0	1.0
Americot 1532B2RF	4.3	34.6	80.7	27.4	10.7	1.7	81.5	8.8	1.0	1.0
Dyna-Gro 2570B2RF	4.5	34.1	80.7	29.5	11.6	1.0	79.7	9.5	1.3	1.0
Deltapine 0924B2RF	4.6	33.9	80.7	29.5	11.1	1.0	80.2	9.2	1.7	1.0
Deltapine 164B2RF	4.3	35.4	80.5	29.7	9.7	1.0	81.5	8.7	1.3	1.0
Deltapine 174RF	4.4	34.4	80.4	28.2	10.6	1.3	79.9	8.8	2.0	1.0
FiberMax 1740B2F	4.8	32.0	79.6	27.4	10.6	1.0	80.7	8.6	1.7	1.0
FiberMax 9160B2F	4.3	34.4	81.1	29.9	9.0	1.3	82.1	8.4	1.3	1.0
FiberMax 9180B2RF	4.6	34.8	80.8	30.9	9.8	1.7	82.6	8.1	1.3	1.0
NexGen 3348B2RF	4.4	33.8	80.9	29.4	9.8	2.7	80.0	8.5	2.0	1.0
NexGen 3410RF	4.0	34.7	80.8	30.2	10.0	3.0	79.2	8.7	2.3	1.0
PhytoGen 375WRF	4.6	33.4	80.2	28.4	10.6	2.0	80.3	9.2	2.0	1.0
Test average	4.4	34.2	80.6	29.1	10.4	1.6	80.7	8.8	1.6	1.0
CV, %	2.1	1.0	0.5	1.9	2.9	44.6	0.7	3.4	--	--
OSL	<0.0001	<0.0001	0.0303	<0.0001	<0.0001	0.0153	<0.0001	0.0003	--	--
LSD	0.2	0.6	0.7	0.9	0.5	1.2	0.9	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.

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Replicated Dryland Conventional Cotton Variety Demonstration, AGCARES, Lamesa, TX - 2009

Cooperators: Lamesa Cotton Growers/Texas AgriLife Research/ Texas AgriLife Extension

Jeff Wyatt, Tommy Doederlein, Randy Boman, Mark Kelley and Chris Ashbrook
CEA-ANR Dawson County, EA-IPM Dawson/Lynn Counties, Extension Agronomist - Cotton, Extension Program Specialist II - Cotton, and Extension Assistant - Cotton

Dawson County

Summary: **All entries in this trial were managed as conventional cotton even though a FiberMax 9058F (Roundup Ready Flex) variety was included for comparison**. Hot, dry conditions during and after planting resulted in significant stress on the trial. Even though a Roundup Ready Flex variety was planted as a buffer on the edges of the trial, **some glyphosate drift from an adjacent field was encountered early in the growing season**. Conventional varieties in the first replicate were affected by this drift, which somewhat reduced yields. Significant differences were noted for most yield and some fiber quality parameters measured. Lint turnout ranged from 36.3% for Seed-Tec Genetics CT-210 to 30.8% for Bronco 263. Lint yields varied from a low of 325 lb/acre (Bronco 263) to a high of 522 lb/acre (FiberMax 9058F). Lint loan values were not significantly different and averaged $0.4969/lb. When subtracting ginning costs, the net value/acre among varieties ranged from a high of $278.59 (FiberMax 9058F) to a low of $178.76 (Bronco 263), a difference of $99.83. **Net value/acre does not include seed costs (and technology fees for the FiberMax 9058F), or weed control cost**. Micronaire values ranged from a low of 3.7 for Bronco 263 to a high of 4.8 for Seed-Tec Genetics CT-210. No significant differences were observed among varieties for staple (32.0 average), uniformity (78.5% average) or strength (26.9 g/tex). These data indicate that substantial differences can be obtained in terms of net value/acre due to variety selection. Additional multi-site and multi-year applied research is needed to evaluate conventional varieties across a series of environments.

Objective: The objective of this project was to compare yields, gin turnout, fiber quality, and economic returns of conventional cotton varieties under dryland production in the Texas High Plains.

Materials and Methods:

Varieties:	Arkansas 9803-17-04, Bronco 141, Bronco 263, Bronco 7139, FiberMax 9058F (included as a transgenic check), Seed-Tec Genetics CT-210, Seed-Tec Genetics CT-212, and Seed-Tec Genetics Linwood
Experimental design:	Randomized complete block with 3 replications
Seeding rate:	4 seeds/row-ft in solid planted 40-inch row spacing (John Deere MaxEmerge vacuum planter)
Plot size:	4 rows by length of field (800 ft)
Planting date:	21-May
Weed management:	**The entire project was managed as conventional cotton.** Trifluralin was applied preplant incorporated at 1 pt/acre across all varieties on 15-April. Plots were hoed on 25-June and spot sprayed with a 1% Roundup PowerMax solution on 17-July. Two cultivation events were conducted at this location.

Rainfall:

April:	0.01"	August:	0.01"
May:	1.25"	September:	0.35"
June:	1.79"	October:	0.76"
July:	1.22"		

Total rainfall: 5.39"

Insecticides:	This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.
Fertilizer:	38 lbs N, 19 lbs P_2O_5, 13 lbs S/acre applied as 20-10-0-7 on 9-March.
Harvest aids:	Harvest aids included 21 oz/acre Prep + 1.5 oz/acre ET with 1% v/v crop oil on 21-September followed by 24 oz/acre Gramoxone Inteon with 0.25% v/v NIS on 2-October.
Harvest:	Plots were harvested on 31-October using a commercial John Deere 7445 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 AgriLife Research and Extension Center at Lubbock to determine gin turnouts.

Fiber analysis: Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University 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 costs and technology fees were not included in the determination of net value due to differences in weed control systems.

Results and Discussion:

All entries in this trial were managed as conventional cotton even though a FiberMax 9058F (Roundup Ready Flex) variety was included for comparison. Weed pressure at this site would generally be considered light to medium and consisted mainly of silverleaf nightshade, pigweed, and puncturevine. Hot, dry conditions during and after planting resulted in significant stress on the trial. Even though a Roundup Ready Flex variety was planted as a buffer on the edges of the trial, some glyphosate drift from an adjacent field was encountered early in the growing season. **Conventional varieties in the first replicate were affected by this drift, which somewhat reduced yields**.

Significant differences were noted for most yield and some fiber quality parameters measured (Tables 1 and 2). Lint turnout ranged from 36.3% for Seed-Tec Genetics CT-210 to 30.8% for Bronco 263. Lint yields varied from a low of 325 lb/acre (Bronco 263) to a high of 522 lb/acre (FiberMax 9058F). Lint loan values were not significantly different among varieties and averaged $0.4969/lb. After adding lint and seed value, total value/acre ranged from a low of $210.37 for Bronco 263, to a high of $323.47 for FiberMax 9058F. When subtracting ginning costs, the net value/acre among varieties ranged from a high of $278.59 (FiberMax 9058F) to a low of $178.76 (Bronco 263), a difference of $99.83. **Net value/acre does not include seed costs (and technology fees for the FiberMax 9058F), or weed control cost**. Micronaire values ranged from a low of 3.7 for Bronco 263 to a high of 4.8 for Seed-Tec Genetics CT-210. No significant differences were observed among varieties for staple (32.0 average), uniformity (78.5% average) or strength (26.9 g/tex average). Significant differences were observed among varieties for percent elongation (9.2 average), Rd or reflectance (79.4 average) and +b or yellowness (7.8 average) but not for leaf grade (2.4 average). These data indicate that substantial differences can be obtained in terms of net value/acre due to variety selection. Additional multi-site and multi-year applied research is needed to evaluate conventional varieties across a series of environments.

Acknowledgments:

Appreciation is expressed to Danny Carmichael, AgriLife Research Associate - AG-CARES, Lamesa for his cooperation with this project. Further assistance was provided by Dr. Jane Dever - Texas AgriLife Research and Extension Center, Lubbock, and Dr. Eric Hequet - Associate Director, Fiber and Biopolymer Research Institute, Texas Tech University. We also greatly appreciate the Texas Department of Agriculture - Food and Fiber Research for funding of HVI testing.

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Table 1. Harvest results from the replicated dryland conventional variety demonstration, AG-CARES Farm, Lamesa, 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	Net value*	
	-------- % --------		---------- lb/acre ----------			$/lb	---------- $/acre ----------					
FiberMax 9058F	34.9	53.0	1496	522	793	0.4997	260.04	63.43	323.47	44.88	278.59	a
Bronco 7139	35.5	51.5	1239	440	638	0.5015	220.81	51.02	271.83	37.16	234.67	b
Seed-Tec Genetics CT-210	36.3	54.0	1210	439	654	0.4872	214.12	52.31	266.44	36.31	230.13	b
Seed-Tec Genetics CT-212	34.8	53.7	1149	400	616	0.5012	200.49	49.34	249.83	34.47	215.36	bc
Seed-Tec Genetics Linwood	33.9	50.5	1142	387	577	0.4925	190.85	46.14	236.99	34.26	202.73	cd
Bronco 141	31.2	56.6	1160	361	656	0.4775	172.58	52.47	225.05	34.79	190.25	cd
Arkansas 9803-17-04	34.3	51.4	968	332	498	0.5163	171.41	39.81	211.22	29.04	182.18	d
Bronco 263	30.8	56.7	1054	325	598	0.4993	162.55	47.81	210.37	31.61	178.76	d
Test average	34.0	53.4	1177	401	629	0.4969	199.11	50.29	249.40	35.31	214.08	
CV, %	4.7	2.7	5.9	5.9	6.0	5.1	7.3	6.0	6.8	5.9	7.1	
OSL	0.0068	0.0005	<0.0001	<0.0001	<0.0001	0.7340	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
LSD	2.8	2.5	122	41	66	NS	25.42	5.25	29.57	3.67	26.65	

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.
***Net value after ginning. Seed/technology costs if applicable were not removed.**

Table 2. HVI fiber property results from the replicated dryland conventional variety demonstration, AG-CARES Farm, Lamesa, 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
Arkansas 9803-17-04	4.3	32.9	79.7	27.8	9.6	2.7	78.5	7.7	3.0	1.0
Bronco 141	3.8	31.6	77.8	25.3	8.8	2.0	79.7	8.1	2.7	1.0
Bronco 263	3.7	32.7	79.0	27.7	8.5	3.3	79.7	7.8	3.0	1.0
Bronco 7139	4.1	32.2	78.6	27.0	8.6	2.7	79.2	7.8	3.0	1.0
FiberMax 9058F	3.8	32.8	77.6	25.3	8.1	2.0	80.2	7.0	3.0	1.0
Seed-Tec Genetics CT-210	4.8	30.7	78.5	26.9	9.8	1.0	79.9	7.9	3.0	1.0
Seed-Tec Genetics CT-212	4.6	31.1	78.4	27.8	10.4	2.3	80.2	8.0	2.3	1.0
Seed-Tec Genetics Linwood	4.7	32.2	78.6	27.7	10.1	3.3	77.4	8.2	3.3	1.0
Test average	4.2	32.0	78.5	26.9	9.2	2.4	79.4	7.8	2.9	1.0
CV, %	8.6	3.3	1.3	5.4	5.1	50.4	0.8	2.3	--	--
OSL	0.0078	0.1600	0.3756	0.2025	0.0002	0.3617	0.0007	<0.0001	--	--
LSD	0.6	NS	NS	NS	0.8	NS	1.1	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, NS - not significant.

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6-Year Summary of the Replicated Dryland Cotton Seeding Rate and Planting Pattern Demonstration, AG-CARES, Lamesa, TX, 2003-2009.

Cooperators: Lamesa Cotton Growers/Texas AgriLife Research/ Texas AgriLife Extension

Randy Boman, Mark Kelley, Chris Ashbrook, and Tommy Doederlein
Extension Agronomist-Cotton, Extension Program Specialist II-Cotton, Extension Assistant, and EA-IPM Dawson/Lynn Counties

Dawson County

Summary: Significant differences were observed for most yield and HVI fiber quality parameters reported (Table 1). Lint turnout (mean 30.2%) differences were minor but significant at the 0.05 level for 2 vs. 4 and 6 seed/ft solid planted. The 6 seed/ft seeding rate reduced turnout by a difference of 1.3% when compared to 2 seed/ft. Lint yield (mean 421 lb/acre) differences (on a land-acre basis) were noted at the 0.10 level when comparing 2 and 4 vs. 6 seed/ft solid planted. Lint yield was significantly lower for the 6 seed/ft solid planted, attributed to excessive plant competition under dryland conditions. Loan value (mean 0.5289 $/lb) differences were noted at the 0.10 probability level when comparing 2 vs. 6 seed/ft solid and at the 0.05 probability level when comparing 2 vs. 4 seed/ft solid planted and 2 vs. 6 seed/ft 2x1 skip pattern. As seeding rate increased, net value per land acre decreased regardless of planting pattern. This was a result of higher seed and technology fee costs with higher seeding rates. When comparing similar seeding rates (52,272) on a land-acre basis (4 seed/ft solid vs. 6 seed/ft 2x1 skip), no differences were observed. These data indicate that over a 6-year time period the 2x1 skip row planting pattern did not exhibit any substantial agronomic and economic benefit in terms of net value per land acre when compared to the solid planting pattern **at similar seeding rates on a land acre basis (4 seed/ft solid vs. 6 seed/ft 2x1 skip)**. **About 3.0-4.0 seed/ft in solid-planted 40-inch rows have been planted in AG-CARES dryland projects. It appears that somewhat fewer than that will not adversely affect potential profitability over the long term however, knowing seed quality and utilizing effective seed treatments are critical, and potential stand losses due to weather should be considered. These data can also be used to support the fact that if producers are planting conventional varieties with much less cost on a per acre basis than transgenic, then seeding rates for those should not be excessive, as 6 seed/ft in solid planted stands reduced yield and some fiber quality parameters.**

Objectives: The objective of this project was to compare yields, gin turnout, fiber quality, and economic returns of solid planted and skip-row transgenic cotton under dryland production across several years in the Texas High Plains.

Materials and Methods:

Varieties: 2003-2005 AFD 3511R, 2006-2009 FiberMax 9058F (2006 lost due to drought)

Experimental design: Randomized complete block with 3 replications

Seeding rates and planting patterns: 2, 4, and 6 seeds/row-ft down each row in 40-inch row spacing (John Deere MaxEmerge vacuum planter). For ease of planting, all plots were seeded in a solid pattern and shortly after seedling emergence, cultivator sweeps were used to destroy seedling plants in the skip row to appropriately establish the plant 2 and skip 1 planting pattern. Seeding rates for the plant 2 and skip 1 planting pattern were ultimately one-third less on a land-acre basis

Plot size: 16 rows by 250 ft long

Planting dates: June 11, 2003; June 8, 2004; June 2, 2005; 2006 lost; May 23, 2007; June 2, 2008; May 21, 2009

Weed management: Trifluralin was typically applied preplant incorporated at 1-1.25 pt/acre each year. Glyphosate was typically applied over-the-top in early June with 17 lbs/100 gallons of ammonium sulfate during years when AFD 3511RR was planted. When the planted variety was changed in 2006 to FiberMax 9058F, glyphosate was generally applied in June or July with ammonium sulfate based spray additive. Plots were cultivated as needed for weed escapes.

Rainfall: April - September rainfall

2003:	10.68"	2004:	13.96"
2005:	6.50"	2006:	lost crop
2007:	18.50"	2008:	14.19"
2009:	5.39"		

Harvest aids: Gramoxone Max or Inteon (paraquat) alone or tank mixes of Prep (ethephon) and Def (tribufos) were applied each year, with rates dependent upon crop condition.

Harvest: The center 8 rows of the 16 row plots were harvested using a commercial John Deere 7445 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 on a land-acre basis.

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 Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis. Commodity Credit Corporation (CCC) Loan values were determined for each plot based on HVI results. **The 2009 Loan chart was used to standardize loan value data for all years**.

Seed and technology fees: Seed and technology fees were based on the 2, 4, and 6 seed/row-ft for the solid and the 2x1 skip row pattern (66.6% of solid planting rate) and reported on the land acre basis. **2009 seed and technology fee prices for FiberMax 9058F were assumed in the analysis**. Seed and technology fee pricing was obtained from the 2009 Plains Cotton Growers Seed Cost Calculator. Land-acre basis seeding rates and seed and technology fee costs based on 2009 pricing for FiberMax 9058F were for the solid planted: 2 seed/row-ft, 26,136, $30.18; 4 seed/row-ft, 52,272, $60.35; and 6 seed/row-ft, 78,408, $90.53. For the 2x1 skip row pattern these were: 2 seed/row-ft, 17,424, $20.12; 4 seed/row-ft, 34,848, $40.24; and 6 seed/row-ft, 52,272, $60.35. The 2x1 skip row pattern was assumed to have one-third less seed on a land-acre basis.

Statistical analysis: Gross loan values (data not presented) were calculated by multiplying lint yields by the 2009 Commodity Credit Corporation loan chart for the HVI values obtained. Seed value was set at $160/ton (data not presented). Ginning cost was set at $3/cwt of bur cotton (data not presented). **Net value per land acre was determined using combined lint and seed values, minus ginning costs and 2009 seed and technology fee costs (for FiberMax 9058F)**. Data were combined across years using the Mixed procedure in SAS 9.1 for Windows. Cultivar, Year(Cultivar) and Replicate(Cultivar*Year) were considered random effects. Least-squares means for the six-year data set were reported.

Results and Discussion:

For the duration of the project, no substantial stand losses were encountered due to environmental or mechanical damage. Wind erosion control practices were timely, accurate, and effective. Lint turnout (mean 30.2%) differences were minor but significant at the 0.05 level for 2 vs. 4 and 6 seed/ft solid planted (Table 1). The 6 seed/ft seeding rate reduced turnout by a difference of 1.3% when compared to 2 seed/ft. Lint yield (mean 421 lb/acre) differences (on a land-acre basis) were noted at the 0.10 level when comparing 2 and 4 vs. 6 seed/ft solid planted. Lint yield was significantly lower for the 6 seed/ft solid planted, attributed to excessive plant competition under dryland conditions. Loan value (mean 0.5289 $/lb) differences were noted at the 0.10 probability level when comparing 2 vs. 6/seed/ft solid and at the 0.05 probability level when comparing 2 vs. 4 seed/ft solid

planted and 2 vs. 6 seed/ft 2x1 skip pattern. These arise from slight differences in staple and uniformity. As seeding rate increased, net value per land acre decreased regardless of planting pattern. This was a result of higher seed and technology fee costs associated with higher seeding rates. When comparing similar seeding rates (52,272) on a land-acre basis (4 seed/ft solid vs. 6 seed/ft 2x1 skip), no differences were observed. Seeding rate and planting pattern had no significant effect on micronaire (mean 4.1 units) or strength (mean 28.6 g/tex). Staple (mean 34.8 32nds inch) was reduced by the highest seeding rate in the solid planting pattern when comparing 2 vs. 6 seed/ft. No differences in staple were observed among seeding rates within 2x1 skip or when comparing 4 seed/ft solid vs. 6 seed/ft 2x1 skip planting patterns. Uniformity of 4 and 6 seed/ft was reduced when compared to 2 seed/ft in the solid planted treatments. No differences in uniformity were noted in the 2x1 skip row planting pattern. When comparing similar seeding rates on a land-acre basis slightly higher uniformity (mean 80.5%) was noted for the 2x1 skip row planting pattern vs. the solid planted.

Conclusions:

These data indicate that over a 6-year time period the 2x1 skip row planting pattern did not exhibit any substantial agronomic (yield and most quality characteristics) and economic benefit (in terms of net value per land acre) when compared to the solid planting pattern **at similar seeding rates on a land acre basis (4 seed/ft solid vs. 6 seed/ft 2x1 skip)**. No differences were noted between the 4 seed/ft solid and the 6 seed/ft 2x1 skip row pattern for lint turnout and yield, loan value, net value, micronaire, staple, and strength. There was a small, but significant, effect of these two comparison treatments on uniformity (0.8% favoring the 6 seed/ft skip row pattern). This project was fertilized and managed (herbicides, insecticides, harvest-aid chemicals) uniformly across both skip row and solid planting patterns. It did not include evaluation of potential reduced input costs by not fertilizing, spraying, etc. the skip row. If these possible input savings on the skip row could be implemented, cost reductions favoring skip row production are likely.

When comparing the lowest seeding rate (2 seed/ft) to the highest seeding rate (6 seed/ft), the highest seeding rate had a greater negative effect on lint yield and net value for the solid planting pattern than for the 2x1 skip row pattern. This is due to excessive competition with the higher plant population arising from the 6 seed/ft seeding rate when compared to 2 seed/ft. In terms of net value, seeding rate had a large effect regardless of planting pattern due to higher seed and technology fee costs.

We have been planting about 3.0-4.0 seed/ft in solid-planted 40-inch rows in AG-CARES dryland projects. Based on this work, it appears that somewhat fewer than that will not adversely affect potential profitability over the long term however, **knowing seed quality and utilizing effective seed treatments are critical, and potential stand losses due to weather should be considered**. **These data can also be used to support the fact that if producers are planting conventional varieties with much less cost on a per acre basis than transgenic, then seeding rates for those should not be excessive, as 6 seed/ft in solid planted stands reduced yield and some fiber quality parameters**.

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Disclaimer Clause:

Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Table 1. Six-year least squares means of agronomic and economic results of the dryland seeding rate by planting pattern trials (lint yield and net value expressed on a land-acre basis), Lamesa - AG-CARES 2003-2009.

Treatment	Lint turnout	Lint yield	Loan value	Net value††	Micronaire	Staple	Uniformity	Strength
	%	lb/acre	$/lb	$/acre	units	32nds inch	%	g/tex
Solid planting pattern								
2 seed/ft (26,136/acre with $30.18/acre cost)	30.8	420	0.5336	207.94	4.1	34.9	80.6	28.8
4 seed/ft (52,272/acre with $60.35/acre cost)	29.6	420	0.5169	170.90	4.0	34.5	79.8	28.3
6 seed/ft (78,408/acre with $90.53/acre cost)	29.5	393	0.5201	127.59	4.0	34.2	80.0	28.5
2x1 skip row planting pattern								
2 seed/ft (17,424/acre with $20.12/acre cost)	30.3	435	0.5429	230.60	4.2	35.2	80.9	28.6
4 seed/ft (34,848/acre with $40.24/acre cost)	30.4	433	0.5332	205.39	4.1	35.2	81.0	28.8
6 seed/ft (52,272/acre with $60.35/acre cost	30.4	424	0.5267	176.65	4.1	34.9	80.6	28.4
Mean	30.2	421	0.5289	186.51	4.1	34.8	80.5	28.6
Differences of least-squares means	----------	----------	----------	Pr > |t|	----------	----------	----------	----------
2 seed/ft solid vs. 4 seed/ft solid	*	NS	*	*	NS	NS	*	NS
2 seed/ft solid vs. 6 seed/ft solid	*	†	†	*	NS	*	†	NS
4 seed/ft solid vs. 6 seed/ft solid	NS	†	NS	*	NS	NS	NS	NS
2 seed/ft 2x1 skip vs. 4 seed/ft 2x1 skip	NS	NS	NS	*	NS	NS	NS	NS
2 seed/ft 2x1 skip vs. 6 seed/ft 2x1 skip	NS	NS	*	*	NS	NS	NS	NS
4 seed/ft 2x1 skip vs. 6 seed/ft 2x1 skip	NS	NS	NS	*	NS	NS	NS	NS
4 seed/ft solid vs. 6 seed/ft 2x1 skip	NS	NS	NS	NS	NS	NS	*	NS

†, * indicate significance at the 0.10 and 0.05 probablility levels, respectively, NS - not signficant.

†† - Net value/land acre was calculated using combined lint and seed value minus ginning cost and 2009 seed and technology fees for FiberMax 9058F.

Common Variety Comparisons Across Dryland Locations

Table 1. Lint Yield Summary Across Dryland Locations - 2009

Entry	RACE Trials			Gaines County
	Dawson County	Lamb County	Lubbock County	Seminole
	lbs/acre			
All-Tex Epic RF	550	349	288	557
Americot 1532B2RF	--	--	--	459
Croplan Genetics 3035RF	494	--	319	--
Croplan Genetics 3520B2RF	--	306	--	--
Deltapine 0924B2RF	--	--	--	487
Deltapine 0935B2RF	--	297	--	--
Deltapine 0949B2RF	413	--	322	--
Deltapine 164B2RF	--	--	--	426
Deltapine 174RF	--	--	--	471
Dyna-Gro 2570B2RF	--	319	--	510
FiberMax 1740B2F	--	--	--	555
FiberMax 9058F	443	--	257	--
FiberMax 9160B2F	421	317	272	468
FiberMax 9180B2RF	--	--	--	440
NexGen 3348B2RF	--	--	--	504
NexGen 3410RF	361	345	292	453
PhytoGen 375WRF	442	323	270	476
Stoneville 4288B2F	411	355	353	--
Test average	442	326	297	484
CV, %	6.8	2.7	10.5	3.8
OSL	<0.0001	<0.0001	0.0297	<0.0001
LSD	52	15	55	31

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level.

Table 2. Micronaire Summary Across Dryland RACE Trial Locations - 2009

Entry	RACE Trials			Gaines County
	Dawson County	Lamb County	Lubbock County	Seminole
	micronaire units			
All-Tex Epic RF	4.2	2.3	3.2	4.5
Americot 1532B2RF	--	--	--	4.3
Croplan Genetics 3035RF	4.1	--	3.4	--
Croplan Genetics 3520B2RF	--	2.3	--	--
Deltapine 0924B2RF	--	--	--	4.6
Deltapine 0935B2RF	--	2.3	--	--
Deltapine 0949B2RF	4.0	--	3.3	--
Deltapine 164B2RF	--	--	--	4.3
Deltapine 174RF	--	--	--	4.4
Dyna-Gro 2570B2RF	--	2.2	--	4.5
FiberMax 1740B2F	--	--	--	4.8
FiberMax 9058F	3.6	--	3.2	--
FiberMax 9160B2F	3.7	2.3	3.0	4.3
FiberMax 9180B2RF	--	--	--	4.6
NexGen 3348B2RF	--	--	--	4.4
NexGen 3410RF	3.5	2.4	3.4	4.0
PhytoGen 375WRF	4.0	2.3	3.0	4.6
Stoneville 4288B2F	4.0	2.5	3.8	--
Test average	3.9	2.3	3.3	4.4
CV, %	10.7	3.8	11.4	2.1
OSL	0.3555	0.0234	0.2167	<0.0001
LSD	NS	0.2	NS	0.2

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.

Table 3. Staple Summary Across Dryland Locations - 2009

Entry	RACE Trials			Gaines County
	Dawson County	Lamb County	Lubbock County	Seminole
	32 nds inches			
All-Tex Epic RF	30.8	33.2	32.9	34.3
Americot 1532B2RF	--	--	--	34.6
Croplan Genetics 3035RF	31.4	--	33.5	--
Croplan Genetics 3520B2RF	--	35.0	--	--
Deltapine 0924B2RF	--	--	--	33.9
Deltapine 0935B2RF	--	34.1	--	--
Deltapine 0949B2RF	31.8	--	34.5	--
Deltapine 164B2RF	--	--	--	35.4
Deltapine 174RF	--	--	--	34.4
Dyna-Gro 2570B2RF	--	34.1	--	34.1
FiberMax 1740B2F	--	--	--	32.0
FiberMax 9058F	32.5	--	36.0	--
FiberMax 9160B2F	31.5	35.5	35.4	34.4
FiberMax 9180B2RF	--	--	--	34.8
NexGen 3348B2RF	--	--	--	33.8
NexGen 3410RF	32.7	35.0	35.2	34.7
PhytoGen 375WRF	31.5	33.5	34.0	33.4
Stoneville 4288B2F	31.9	34.0	33.4	--
Test average	31.8	34.3	34.4	34.2
CV, %	3.3	2.3	2.8	1.0
OSL	0.4150	0.0314	0.0133	<0.0001
LSD	NS	1.4	1.7	0.6

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.

Table 4. Uniformity Summary Across Dryland Locations - 2009

Entry	RACE Trials			Gaines County
	Dawson County	Lamb County	Lubbock County	Seminole
	%			
All-Tex Epic RF	78.5	78.5	79.4	80.6
Americot 1532B2RF	--	--	--	80.7
Croplan Genetics 3035RF	78.7	--	80.0	--
Croplan Genetics 3520B2RF	--	79.6	--	--
Deltapine 0924B2RF	--	--	--	80.7
Deltapine 0935B2RF	--	78.5	--	--
Deltapine 0949B2RF	77.9	--	80.2	--
Deltapine 164B2RF	--	--	--	80.5
Deltapine 174RF	--	--	--	80.4
Dyna-Gro 2570B2RF	--	78.6	--	80.7
FiberMax 1740B2F	--	--	--	79.6
FiberMax 9058F	77.4	--	80.8	--
FiberMax 9160B2F	77.7	79.9	81.5	81.1
FiberMax 9180B2RF	--	--	--	80.8
NexGen 3348B2RF	--	--	--	80.9
NexGen 3410RF	77.4	79.7	80.6	80.8
PhytoGen 375WRF	77.3	78.6	79.8	80.2
Stoneville 4288B2F	77.7	78.3	79.5	--
Test average	77.8	79.0	80.2	80.6
CV, %	1.6	0.9	0.8	0.5
OSL	0.7717	0.0733†	0.0265	0.0303
LSD	NS	1.0	1.2	0.7

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.

Table 5. Strength Summary Across Dryland Locations - 2009

Entry	RACE Trials			Gaines County
	Dawson County	Lamb County	Lubbock County	Seminole
	g/tex			
All-Tex Epic RF	25.3	24.4	26.7	29.3
Americot 1532B2RF	--	--	--	27.4
Croplan Genetics 3035RF	26.1	--	27.2	--
Croplan Genetics 3520B2RF	--	24.6	--	--
Deltapine 0924B2RF	--	--	--	29.5
Deltapine 0935B2RF	--	25.6	--	--
Deltapine 0949B2RF	25.8	--	26.9	--
Deltapine 164B2RF	--	--	--	29.7
Deltapine 174RF	--	--	--	28.2
Dyna-Gro 2570B2RF	--	25.2	--	29.5
FiberMax 1740B2F	--	--	--	27.4
FiberMax 9058F	25.2	--	29.0	--
FiberMax 9160B2F	24.5	25.4	28.4	29.9
FiberMax 9180B2RF	--	--	--	30.9
NexGen 3348B2RF	--	--	--	29.4
NexGen 3410RF	25.2	27.2	28.6	30.2
PhytoGen 375WRF	23.5	23.5	25.7	28.4
Stoneville 4288B2F	24.4	24.7	26.3	--
Test average	25.0	25.1	27.4	29.1
CV, %	5.7	4.7	2.4	1.9
OSL	0.4786	0.0683†	0.0002	<0.0001
LSD	NS	1.7	1.1	0.9

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.

2009 Sites Planted but Lost Due to Weather

Muleshoe Irrigated Systems Variety Trial - 2009				
1	Fill			
2	1	AT Epic RF	Rep I	1.77
3	2	CG 3035RF		1.77
4	3	NG 3348B2RF		1.80
5	4	FM 1740B2F		1.76
6	5	FM 9160B2F		1.75
7	6	FM 9180B2F		1.74
8	7	NG 2549B2RF		1.74
9	8	DP 0912B2RF		1.73
10	9	DG 2570B2RF		1.71
11	10	PHY 375WRF		1.70
12	6	FM 9180B2F	Rep II	1.69
13	9	DG 2570B2RF		1.70
14	8	DP 0912B2RF		1.67
15	7	NG 2549B2RF		1.65
16	3	NG 3348B2RF		1.60
17	10	PHY 375WRF		1.62
18	4	FM 1740B2F		1.60
20	5	FM 9160B2F		1.59
21	2	CG 3035RF		1.57
22	1	AT Epic RF		1.54
24	4	FM 1740B2F	Rep III	1.51
25	9	DG 2570B2RF		1.49
26	1	AT Epic RF		1.46
27	2	CG 3035RF		1.43
29	10	PHY 375WRF		1.40
30	8	DP 0912B2RF		1.36
31	3	NG 3348B2RF		1.33
32	5	FM 9160B2F		1.30
33	6	FM 9180B2F		1.27
34	7	NG 2549B2RF		1.23
35	Fill			
36	Fill			
37	Fill			
38	Fill			
39	Fill			
40	Fill			
41	Fill			
42	Fill			
43	Fill			
44	Fill			
45	Fill			

North \/

	Variety	Variety Acres	Rep 1	Rep 2	Rep 3
1	AT Epic RF	4.8			
2	CG 3035RF	4.8			
3	NG 3348B2RF	4.7			
4	FM 1740B2F	4.9			
5	FM 9160B2F	4.6			
6	FM 9180B2F	4.7			
7	NG 2549B2RF	4.6			
8	DP 0912B2RF	4.8			
9	DG 2570B2RF	4.9			
10	PHY 375WRF	4.7			

Planting date	5/12/2009
Seeding rate	75,600 seed/acre
Insecticide	3.7 lb/acre Temik
Herbicide	1.0 pt/acre Direx (Need to verify with James)
Fertilizer	
Temp @ planting	
Moisture @ planting	Good (Turned on pivot after planting)

COMMENTS:

12-row plots on 30-inch centers

planting throughs based on 12 row Eus and 1200 ft long pivot

Fills planted to DP 0912B2RF

1.5" planting depth

Temik in Row 8 may not have gone out in All Tex EpicRF...chain jumped off after start.

Strip Tillage following terminated wheat.

HAILED OUT 6-4-09

Final MSK/RKB 5-19-09

Plains Dryland Systems Variety Trial - 2009		
1	AT Apex B2RF	Rep I
2	NG 3348B2RF	
3	FM 9170B2F	
4	ST 5458B2RF	
5	DP 0924B2RF	
6	DG 2570B2RF	
7	FM 1740B2F	
8	AT Summit B2RF	
9	ST 4498B2RF	
10	CG 3520B2RF	
11	DP 164B2RF	
12	PHY 315RF	
8	AT Summit B2RF	Rep II
7	FM 1740B2F	
2	NG 3348B2RF	
1	AT Apex B2RF	
10	CG 3520B2RF	
9	ST 4498B2RF	
4	ST 5458B2RF	
3	FM 9170B2F	
12	PHY 315RF	
11	DP 164B2RF	
6	DG 2570B2RF	
5	DP 0924B2RF	
9	ST 4498B2RF	Rep III
10	CG 3520B2RF	
7	FM 1740B2F	
8	AT Summit B2RF	
3	FM 9170B2F	
4	ST 5458B2RF	
11	DP 164B2RF	
12	PHY 315RF	
1	AT Apex B2RF	
2	NG 3348B2RF	
5	DP 0924B2RF	
6	DG 2570B2RF	

<==North

	Variety	Plant Order	Rep 2	Rep 3
1	AT Apex B2RF			
2	NG 3348B2RF			
3	FM 9170B2F			
4	ST 5458B2RF			
5	DP 0924B2RF			
6	DG 2570B2RF			
7	FM 1740B2F			
8	AT Summit B2RF			
9	ST 4498B2RF			
10	CG 3520B2RF			
11	DP 164B2RF			
12	PHY 315RF			

Planting date	5/28/2009
Seeding rate	41818 seed/acre or 3.2 seed/row ft
Insecticide	2.0 lb/acre Temik
Herbicide	6.0 oz/acre Trifluralin
Fertilizer	None
Temp @ planting	
Moisture @ planting	Good

COMMENTS:
Plot Size = 6 40" rows X 1024'
Lost due to drought

Final MSK 6-8-09

Blanco Dryland Systems Variety Trial - 2009		
Fill		
1	AT Epic RF	Rep I
2	CG 3035RF	
3	DP 174RF	
4	FM 9058F	
5	NG 3410RF	
6	PHY 315RF	
7	AT Apex B2RF	
8	ST 4498B2RF	
9	NG 3348B2RF	
10	CG 3220B2RF	
11	FM 1740B2F	
12	DP 0924B2RF	
13	FM 9160B2F	
14	DP 0935B2RF	
15	FM 9180B2F	
16	DG 2570B2RF	
17	ST 4288B2F	
18	PHY 375WRF	
12	DP 0924B2RF	Rep II
11	FM 1740B2F	
16	DG 2570B2RF	
15	FM 9180B2F	
8	ST 4498B2RF	
7	AT Apex B2RF	
14	DP 0935B2RF	
13	FM 9160B2F	
18	PHY 375WRF	
17	ST 4288B2F	
10	CG 3220B2RF	
9	NG 3348B2RF	
2	CG 3035RF	
1	AT Epic RF	
6	PHY 315RF	
5	NG 3410RF	
4	FM 9058F	
3	DP 174RF	
5	NG 3410RF	Rep III
6	PHY 315RF	
3	DP 174RF	
4	FM 9058F	
1	AT Epic RF	
2	CG 3035RF	
9	NG 3348B2RF	
10	CG 3220B2RF	
17	ST 4288B2F	
18	PHY 375WRF	
13	FM 9160B2F	
14	DP 0935B2RF	
11	FM 1740B2F	
12	DP 0924B2RF	
15	FM 9180B2F	
16	DG 2570B2RF	
7	AT Apex B2RF	
8	ST 4498B2RF	
Fill		
North		

	Variety	Rep 1	Rep 2	Rep 3
1	AT Epic RF			
2	CG 3035RF			
3	DP 174RF			
4	FM 9058F			
5	NG 3410RF			
6	PHY 315RF			
7	AT Apex B2RF			
8	ST 4498B2RF			
9	NG 3348B2RF			
10	CG 3220B2RF			
11	FM 1740B2F			
12	DP 0924B2RF			
13	FM 9160B2F			
14	DP 0935B2RF			
15	FM 9180B2F			
16	DG 2570B2RF			
17	ST 4288B2F			
18	PHY 375WRF			

Planting date	5/26/2009
Seeding rate	42300 seed/acre
Insecticide	none
Herbicide	ET + Majestic (Pre-Plant)
Fertilizer	none
Temp @ planting	81° F
Moisture @ planting	Fair/Low

COMMENTS:
Plot Size = 4 40" Rows X 1500'

Lost due to drought

Final MSK 6-8-09

Hockley County Drip Irrigated RACE Variety Trial - 2009				
1	Remainder of Field			
2	1	AT Apex B2RF	Rep I	
3	2	NG 3348 B2RF		
4	3	FM 9160B2F		
5	4	ST 4288B2F		
6	5	CG 3220B2RF		
7	6	DP 0912 B2RF		
8	7	DG 2570B2RF		
9	8	PHY 375 WRF		
56 rows Bulk Fill				
12	5	CG 3220B2RF	Rep II	
14	3	FM 9160B2F		
15	8	PHY 375 WRF		
16	1	AT Apex B2RF		
18	7	DG 2570B2RF		
20	4	ST 4288B2F		
21	2	NG 3348 B2RF		
22	6	DP 0912 B2RF		
48 rows Bulk Fill				
24	1	AT Apex B2RF (X-tra planting)	Rep III	
25	8	PHY 375 WRF		
26	2	NG 3348 B2RF		
27	7	DG 2570B2RF		
30	5	CG 3220B2RF		
31	3	FM 9160B2F		
32	6	DP 0912 B2RF		
33	1	AT Apex B2RF (Leak in tape)		
34	4	ST 4288B2F		
45	36 rows Fill			

N==>

	Variety	Rep 1	Rep 2	Rep 3
1	AT Apex B2RF			
2	NG 3348 B2RF			
3	FM 9160B2F			
4	ST 4288B2F			
5	CG 3220B2RF			
6	DP 0912 B2RF			
7	DG 2570B2RF			
8	PHY 375 WRF			

Planting date	5/19/2009
Seeding rate	44805 seed/acre
Insecticide	5 lb/acre Temik (off on DG 2570B2RF)
Herbicide	none
Fertilizer	
Temp @ planting	
Moisture @ planting	Good

COMMENTS:
Hailed out on June 5th

Final plan 5-19-09 (MSK/RKB)

Lynn County Dryland RACE Variety Trial - 2009				
North				
	Fill			
1	1	Rep I	AT Epic RF	
2	2		NG 3410 RF	
3	3		FM 9160B2F	
4	4		ST 4288B2F	
5	5		CG 3035RF	
6	6		DP 0935 B2RF	
7	7		AC 1556RF	
8	8		PHY 375 WRF	
9	4	Rep II	ST 4288B2F	
10	2		NG 3410 RF	
11	7		AC 1556RF	
12	1		AT Epic RF	
13	5		CG 3035RF	
14	3		FM 9160B2F	
15	6		DP 0935 B2RF	
16	8		PHY 375 WRF	
17	4	Rep III	ST 4288B2F	
18	6		DP 0935 B2RF	
19	2		NG 3410 RF	
20	7		AC 1556RF	
21	3		FM 9160B2F	
22	8		PHY 375 WRF	
23	1		AT Epic RF	
24	5		CG 3035RF	
	Fill			
South				

	Variety	Rep 1	Rep 2	Rep 3
1	AT Epic RF			
2	NG 3410 RF			
3	FM 9160B2F			
4	ST 4288B2F			
5	CG 3035RF			
6	DP 0935 B2RF			
7	AC 1556RF			
8	PHY 375 WRF			

Planting date	5/27/2009
Seeding rate	32400 seed/acre
Insecticide	none
Herbicide	none
Fertilizer	none
Temp @ planting	84° F
Moisture @ planting	Dry planted

COMMENTS:
8 40" rows X ~1610'
Lost due to drought

Final MSK 6-8-09

Yoakum County Dryland RACE Variety Trial - 2009			
1	Rep I	AT Epic RF	
2		NG 3410 RF	
3		CG 3035RF	
4		FM 9058F	
5		FM 9160B2F	
6		DP 0935 B2RF	
7		ST 4288B2F	
8		PHY 375 WRF	
2	Rep II	NG 3410 RF	
1		AT Epic RF	
4		FM 9058F	
3		CG 3035RF	
8		PHY 375 WRF	
7		ST 4288B2F	
6		DP 0935 B2RF	
5		FM 9160B2F	
7	Rep III	ST 4288B2F	
8		PHY 375 WRF	
5		FM 9160B2F	
6		DP 0935 B2RF	
3		CG 3035RF	
4		FM 9058F	
1		AT Epic RF	
2		NG 3410 RF	

<==North

	Variety	Plant Order	Rep 2	Rep 3
1	AT Epic RF			
2	NG 3410 RF			
3	CG 3035RF			
4	FM 9058F			
5	FM 9160B2F			
6	DP 0935 B2RF			
7	ST 4288B2F			
8	PHY 375 WRF			

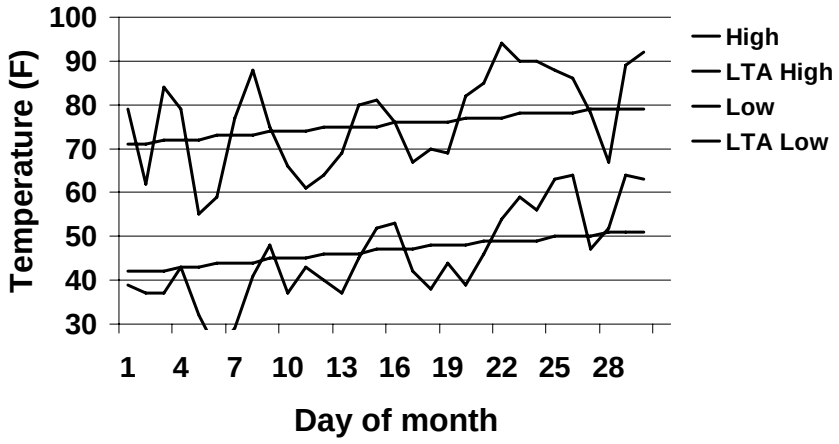
Planting date	5/28/2009
Seeding rate	41818 seed/acre or 3.2 seed/row ft
Insecticide	2.0 lb/acre Temik
Herbicide	6.0 oz/acre Trifluralin
Fertilizer	None
Temp @ planting	
Moisture @ planting	Good

COMMENTS:
Plot size = 6 40" rows X 1024'
Lost due to drought

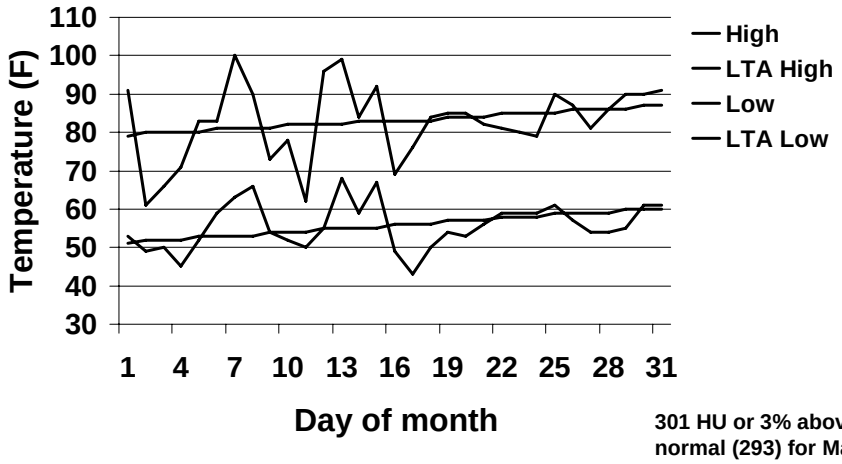
Final, MSK 6-8-09

2009 Lubbock Weather and Crop Information

Lubbock Air Temperatures
April, 2009

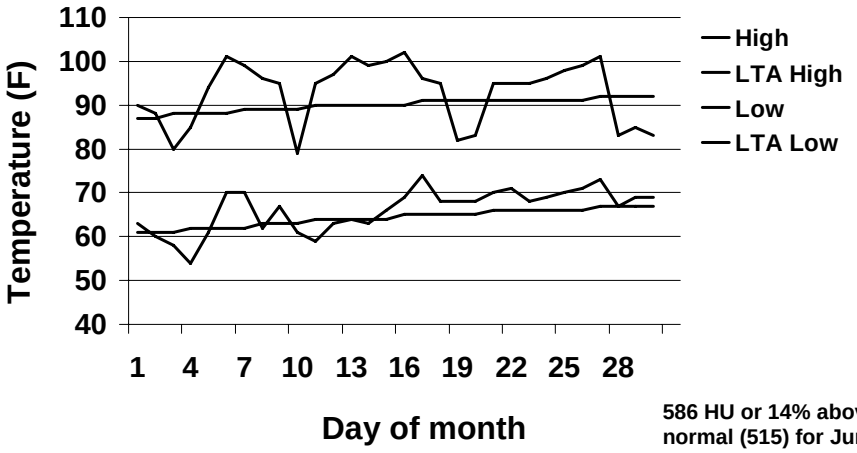


Lubbock Air Temperatures
May, 2009



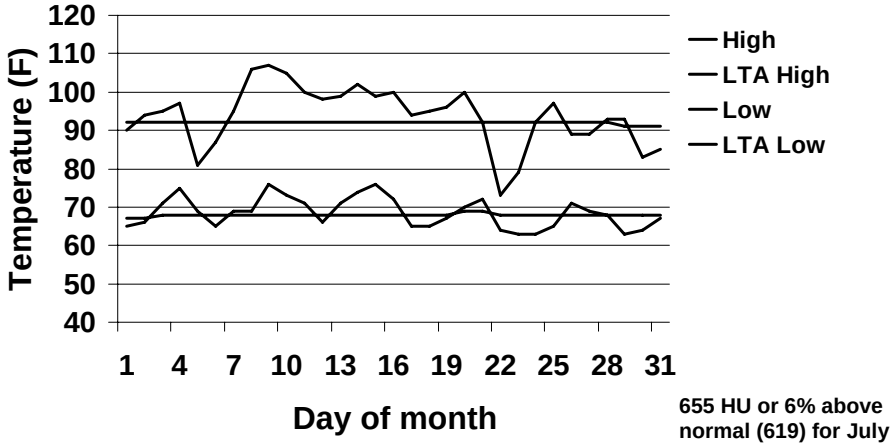
301 HU or 3% above normal (293) for May

Lubbock Air Temperatures
June, 2009



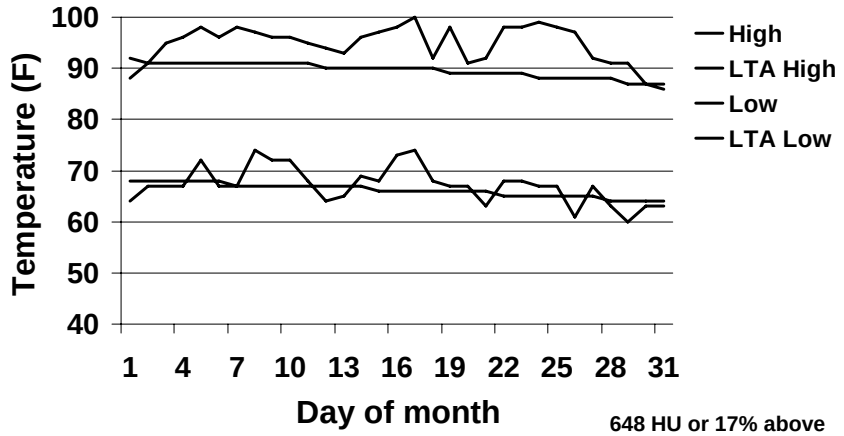
586 HU or 14% above normal (515) for June

Lubbock Air Temperatures
July, 2009



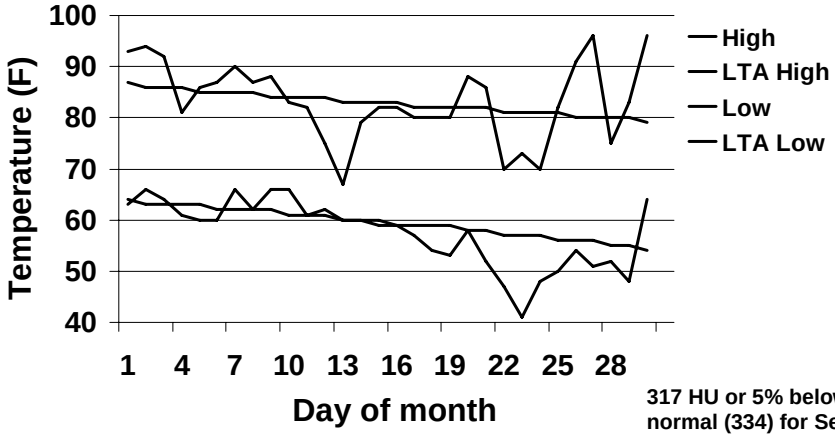
655 HU or 6% above normal (619) for July

Lubbock Air Temperatures
August, 2009



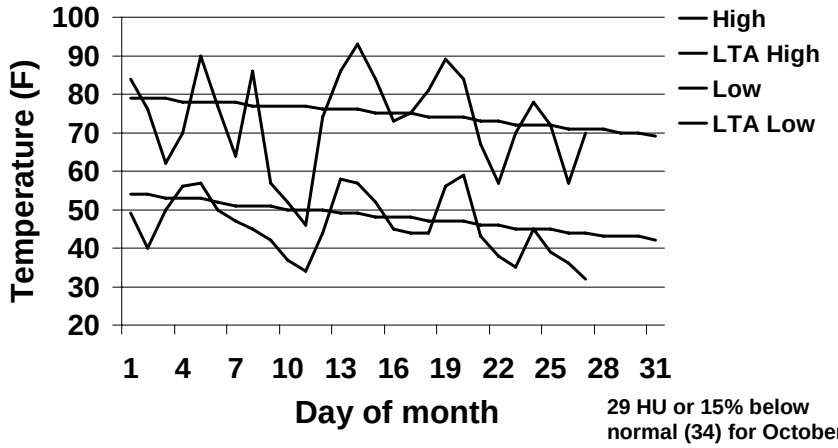
648 HU or 17% above normal (555) for August

Lubbock Air Temperatures
September, 2009



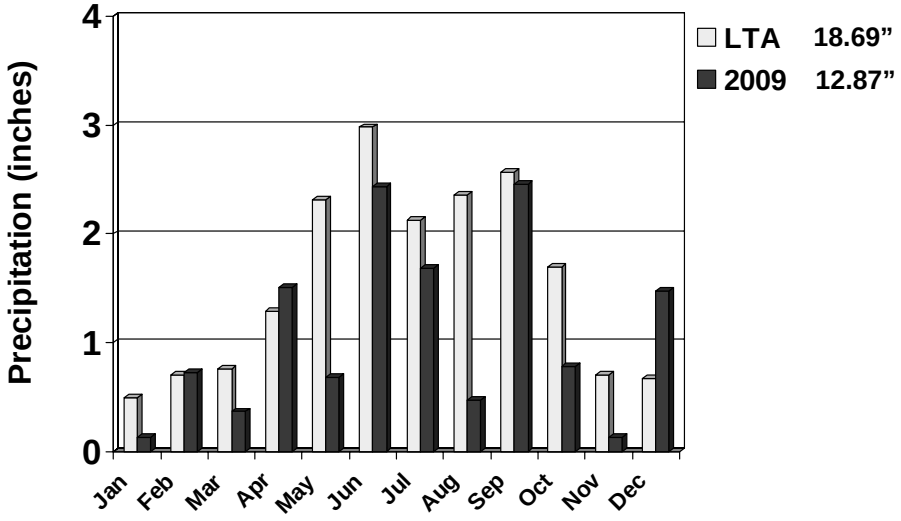
317 HU or 5% below normal (334) for September

Lubbock Air Temperatures October, 2009



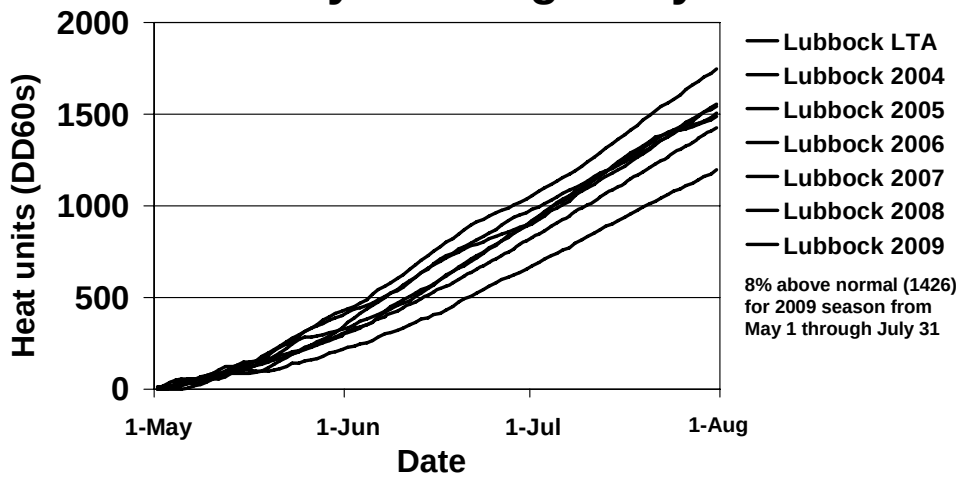
29 HU or 15% below normal (34) for October 1-26
Freeze on October 27

Lubbock LTA (1971-2000) vs. 2009 Rainfall

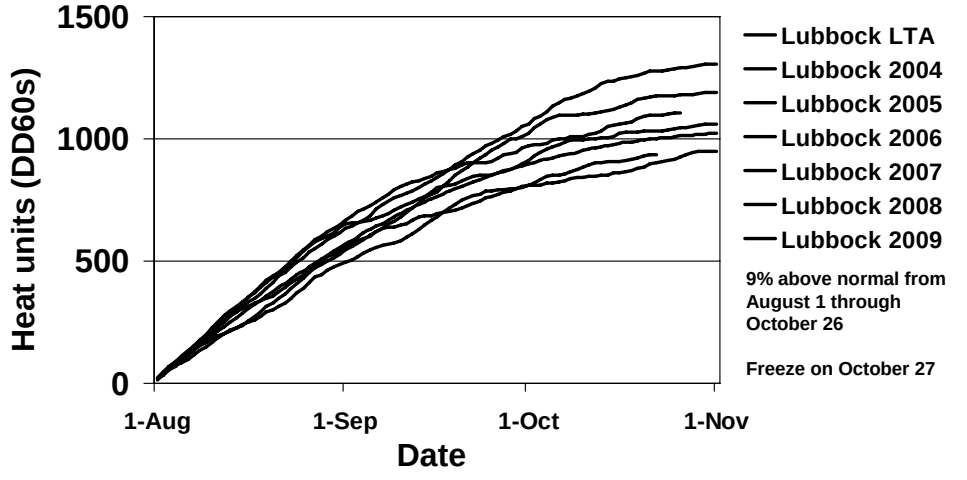


Source: http://www.weather.gov/climate/index.php?wfo=lub

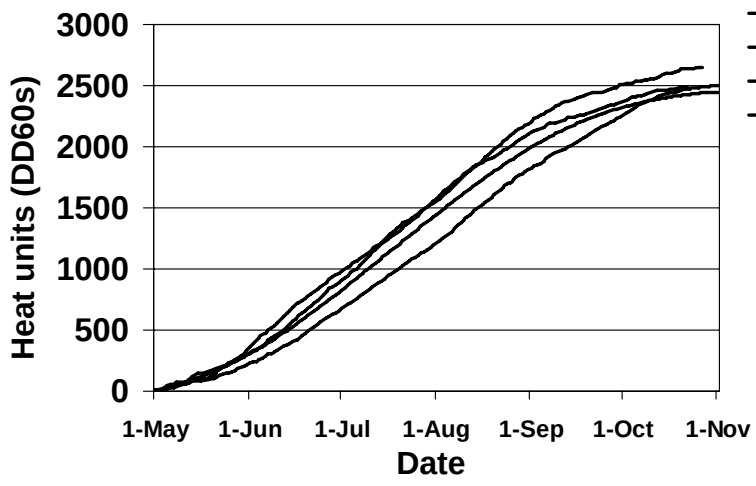
Lubbock 30-Yr Long Term Average (1971-2000) vs. 2004-2009 Cotton Heat Unit Accumulation From May 1 through July 31



Lubbock 30-Yr Long Term Average (1971-2000) vs. 2004-2009 Cotton Heat Unit Accumulation From August 1 through October 31



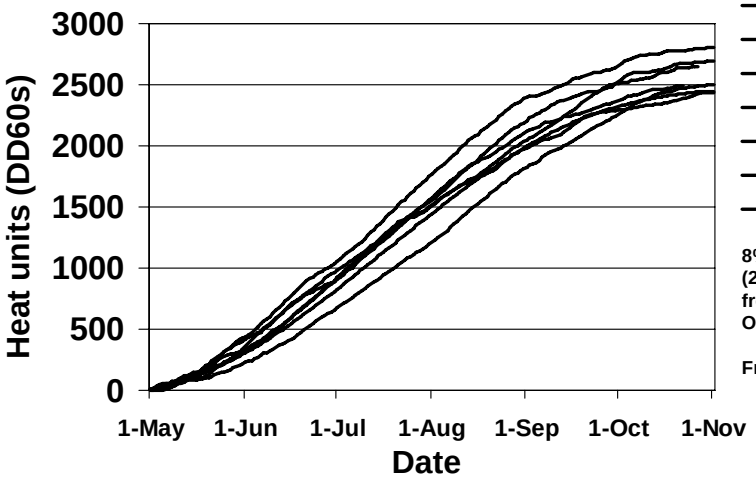
Lubbock 30-Yr Long Term Average (1971-2000) vs. 2007, 2008 and 2009 Cotton Heat Unit Accumulation



8% above normal for May 1- October 26

Freeze October 27

Lubbock 30-Yr Long Term Average (1971-2000) vs. 2004-2009 Cotton Heat Unit Accumulation



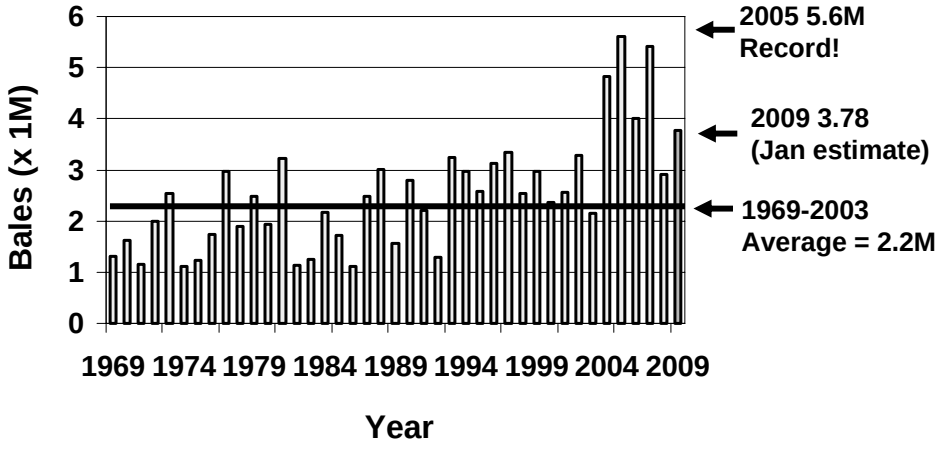
8% above (2645) normal (2439) for 2009 season from May 1 through October 26

Freeze on October 27

2009 Crop?

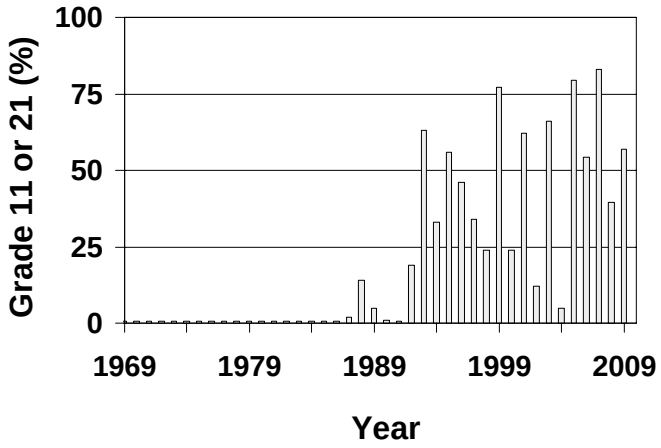
- If TASS estimates hold up, we will harvest 3.78 million bales in 1N and 1S
  - About 850,000 bales larger than last year (2.92M)
  - 2nd smallest crop since 2004 (4.8M bales)
  - Still the 5th largest crop ever
- 56% color grades 11 or 21
  - Significantly higher than 2008 at 40%
- Average leaf somewhat improved compared to last year
- Length and strength somewhat lower than last year
- Micronaire continues to be a major problem at 3.73
  - 31% was 3.4 or lower, 23% 3.2 or lower
- Bark contamination much lower than last year (60%) at 32%

High Plains (TASS 1N and 1S) Total Bale Production 1969-2009



Source: USDA-AMS

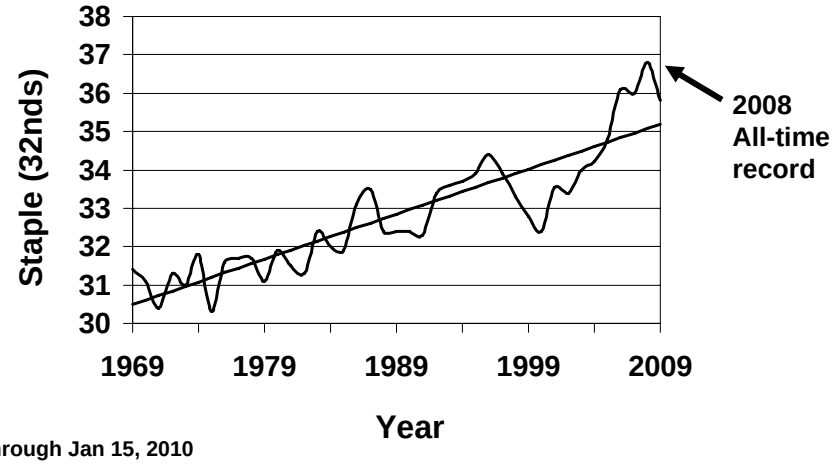
High Plains Color Grades 11 or 21 1969-2009



Source: USDA-AMS

2009 Through Jan 15, 2010

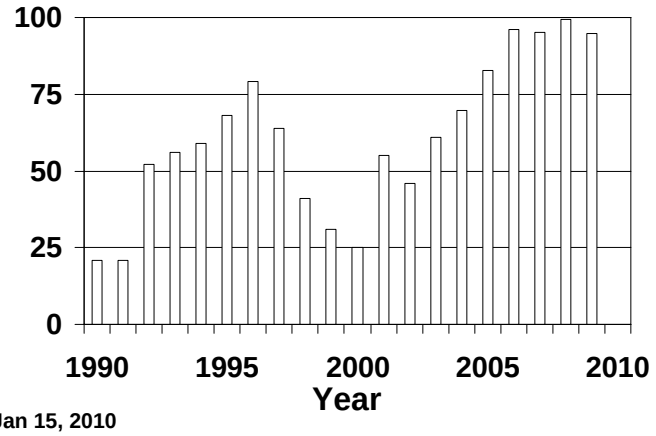
High Plains Average Staple 1969-2009



2009 Through Jan 15, 2010

Source: USDA-AMS

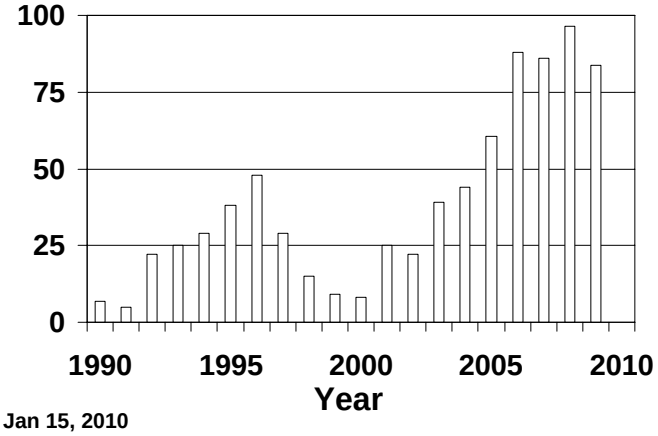
Percent of High Plains Bales with ≥34 Staple 1990-2009



2009 Through Jan 15, 2010

Source: USDA-AMS

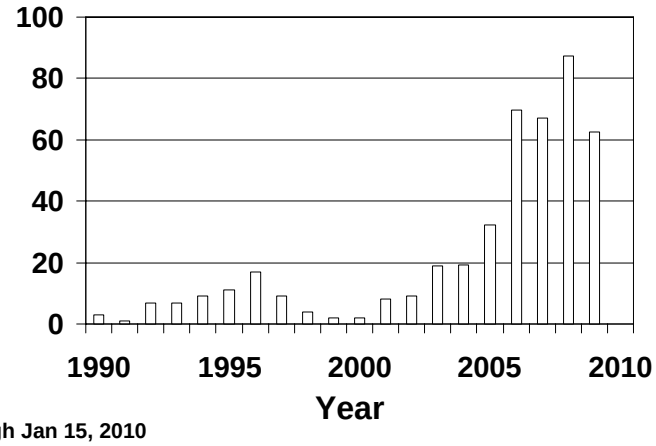
Percent of High Plains Bales with ≥35 Staple 1990-2009



2009 Through Jan 15, 2010

Source: USDA-AMS

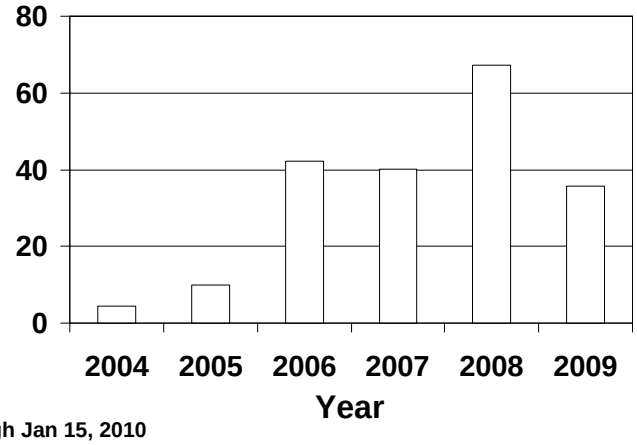
Percent of High Plains Bales with ≥36 Staple 1990-2009



2009 Through Jan 15, 2010

Source: USDA-AMS

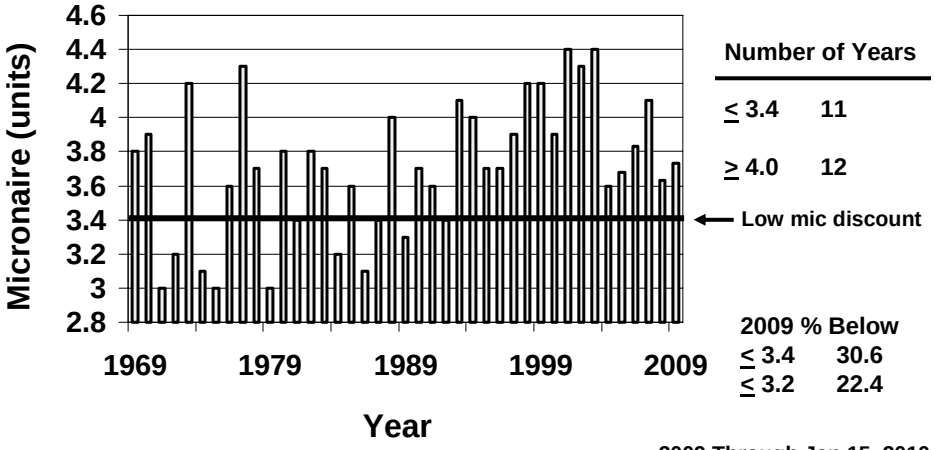
Percent of High Plains Bales with ≥37 Staple 2005-2009



2009 Through Jan 15, 2010

Source: USDA-AMS

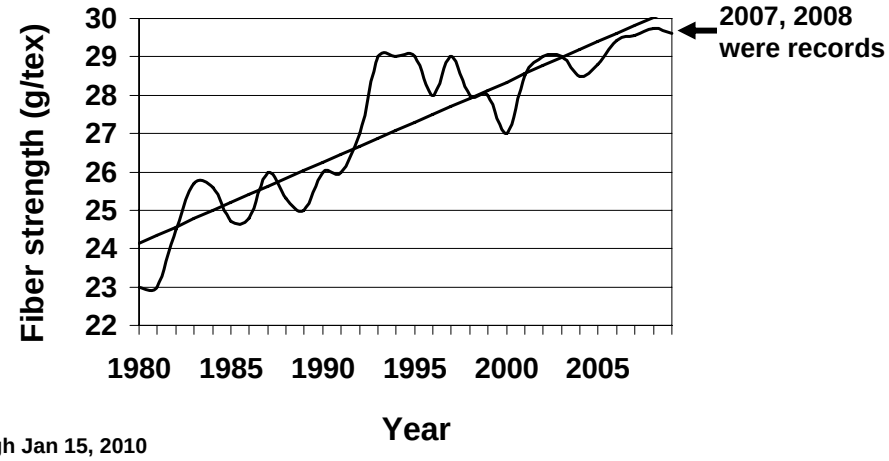
High Plains Micronaire 1969-2009 (41 Years)



Source: USDA-AMS

2009 Through Jan 15, 2010

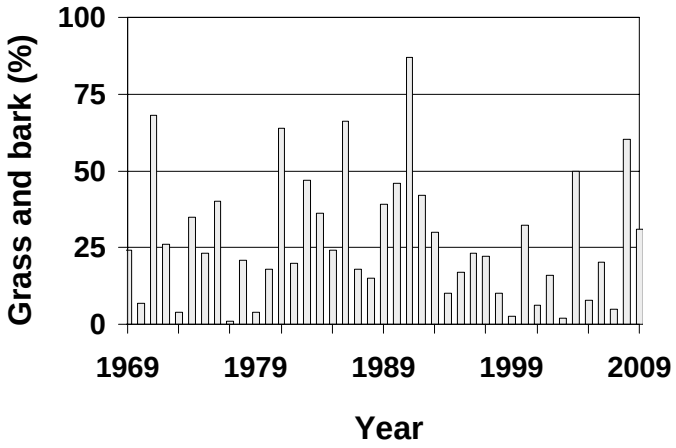
High Plains Average Fiber Strength 1980-2009



2009 Through Jan 15, 2010

Source: USDA-AMS

High Plains Grass and Bark 1969-2009



Source: USDA-AMS

2009 Through Jan 15, 2010

2009 USDA-AMS Cotton Varieties Planted – Top 12

- **Lubbock:**
  - **67.3% FiberMax, 17.5% Deltapine, 2.4% Americot/NexGen**
    - **FM 9058F 30.4%, FM 9063B2F 16.9%, FM 9180B2F 13.5%, DP 174RF 5.7%, FM 958LL 3.8%, FM 958 2.8%, DP 164B2RF 2.7%, DP 0924 B2RF 2.6%, DP 0935 2.4%, AM 1532B2RF 2.4%, DP 147RF 2.3%, DP 0912 B2RF 1.8%, Other 12.8%**
- **Lamesa:**
  - **67.5% FiberMax, 8.4% Deltapine, 7.5% Americot/NexGen**
    - **FM 958 25.1%, FM 9058F 12.7%, FM 9063B2F 11.8%, FM 9180B2F 5.9%, AM 1532B2RF 4.7%, FM 1880B2F 4.6%, FM 9160B2F 4.5%, DP 164B2RF 4.4%, FM 960B2R 2%, NG 3348B2RF 2.9%, DP 0924 B2RF 2.0%, DP 174 RF 2.0% Other 16.7%**

Identifiable Technologies Planted (Unable to Ascertain "Other")

- **Bollgard 2 (includes B2RR and B2RF insect resistance for caterpillar control)**
  - **Lubbock: 42.2%**
  - **Lamesa: 43.6%**

Identifiable Technologies Planted (Unable to Ascertain "Other")

- **Roundup Ready Flex (herbicide tolerant)**
  - **Lubbock: 80.7%**
  - **Lamesa: 54.8%**
- **Liberty Link (herbicide tolerant)**
  - **Lubbock: 3.8%**
  - **Lamesa: NR**

EVALUATING FIELD TRIAL DATA

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Field trials can provide helpful information to producers as they compare products and practices for their operations. However, field trials must be evaluated carefully to make sure results are scientifically sound, not misleading and indicate realistic expectations for on-farm performance.

This fact sheet is designed to give you the tools to help you determine whether data from a field trial is science fact or science fiction.

What are the best sources of field trial data?

Field trials are conducted by a broad range of individuals and institutions, including universities, ag input suppliers, chemical and seed companies and growers themselves. All are potentially good sources of information.

What are the common types of field trials?

Most field trials fall into one of two categories: side-by-side trials (often referred to as strip trials) or small-plot replicated trials. Side-by-side trials are the most common form of on-farm tests. As the name suggests, these trials involve testing practices or products against one another in plots arrayed across a field, often in strips the width of the harvesting equipment.

These strips should be replicated across the field or repeated at several locations to increase reliability. Small-plot replicated trials often are conducted by universities and companies at central locations because of the complexity of managing them and the special planting and harvesting equipment often required.

Replicated treatments increase the reliability of an experiment. They compare practices or products against one another multiple times under uniform growing conditions in several randomized small plots in the same field or location.

Small-plot replicated trials also may be conducted on farmers' fields where special conditions exist, for example, a weed infestation that does not occur on an experiment station.

Are side-by-side plots more valuable than small-plot replicated trials, or vice versa?

Both types of plots can provide good information. The key is to evaluate the reliability of the data. It is also important to consider the applicability of the trial to your farming operation.

When is plot data valid, and when isn't it?

There isn't a black-and-white answer to that questions. But there are good rules of thumb that can help guide you. Consider these three field trial scenarios:

Scenario 1:

A single on-farm side-by-side trial comparing 10 varieties. Each variety is planted in one strip the width of the harvesting equipment and is 250 to 300 feet long.

What you can learn:

This trial will allow you to get a general feel for each variety or hybrid in the test, including how it grows and develops during the season. However, this trial, by itself, probably won't be able to reliably measure differences in yield. This is because variability within the field, even if it appears to be relatively uniform, may be large enough to cause yield variations that mask genetic difference among the varieties. Other varietal characteristics, such as maturity or micronaire in cotton, can also be masked by soil variation.

Scenario 2:

Yield data from side-by-side variety trials conducted on the same varieties on multiple farms in your region.

What you can learn:

When data from multiple side-by-side trials are considered together, reliability increases. In this case, the more trials comparing the same varieties, the better. As you go from three to five to 10 or more locations, the certainty goes up that yield differences represent genetic differences and not field variability. Be aware, however, that small differences between treatments (in this case varieties) may still be within the margin of random variability of the combined trial and may not indicate actual genetic differences. One treatment will almost always be numerically higher. Statistical analysis helps determine if differences are significant (consistent).

Scenario 3:

A university-style small-block replicated trial comparing the same 10 varieties.

What can you learn:

Data from such trials, if they are designed well and carried out precisely, generally are reliable. That is, the results generally determine the yield potential of crop varieties. However, it is still important to consider whether results are applicable to your farming operation and are consistent with other research.

How do I know whether differences in yield, for example, are real and not caused by field variability or sloppy research?

Scientists use statistical analysis to help determine whether differences are real or are the result of experimental error, such as field variation.

The two most commonly used statistics are Least Significant Difference (LSD) and the Coefficient of Variation (CV), both of which can provide insight on the validity of trial data. If these values aren't provided with trial results, ask for them.

Least Significant Difference (LSD) is the minimum amount that two varieties must differ to be considered significantly different. Consider a trial where the LSD for yield is four bushels per acre. If one variety yields 45 bushels per acre and another yields 43 bushels per acre, the two are not statistically different in yield. The difference in their yields is due to normal field variation, not to their genetics. In this example, a variety that yields 45 bushels per acre is significantly better than those yielding less than 41 bushels per acre. In many research trials, LSDs are calculated at confidence level of 75 to 95 percent. For example, a confidence level of 95 percent means you can be 95 percent certain that yield differences greater than the LSD amount are due to genetics and not to plot variability.

Coefficient of Variation (CV) measures the relative amount of random experimental variability not accounted for in the design of a test. It is expressed as a percent of the overall average of the test.

For measuring yield differences, CV's of up to five percent are considered excellent; 5.1 to 10 percent are considered good; and 10.1 to 15 percent are fair.

A high CV means there must be larger differences among treatments to conclude that significant differences exist. The bottom line: When considering yield test data, be skeptical when the CV exceeds 15 percent.

Is a one-year test valid, or are several years of results necessary to know whether one product or practice is superior to another?

In an ideal world, having several years of tests to verify use of a practice or product is best. But where changes are rapid, such as with crop varieties, having university data from multiple years isn't always possible.

When multi-year university data aren't available, pay more careful attention to statistical measures like CV and LSD, and the number of locations and testing environments.

Multi-year data on yield and performance can also be requested from the developers of new products prior to university testing. In either case, be cautious about making major production changes and trying large acreages of a given variety based on one year's data.

How should I evaluate trial results that are markedly different from other research in my area?

When research results are at odds with the preponderance of scientific evidence, examine the new research with extra care.

Pay special attention to factors that might have influenced the outcome, such as soil type, planting date, soil moisture and other environmental conditions, and disease, insect and weed pressures. For example, was the growing season unusually wet or unusually dry? When was it dry or wet? What was the crop growth stage when it was wet or dry? Was there a disease that affected one variety or hybrid more than another one? Were there insect problems? Could this have influenced the trial's outcome and its applicability to your operation? If you determine that unusual circumstances affected the outcome, be cautious about how you use the results.