AgriLIFE EXTENSION
Texas A&M System

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

2008 Final Report

Submitted to
Plains Cotton Growers
Plains Cotton Improvement Program

Dr. Randy Boman, Extension Agronomist-Cotton
Dr. Mark Kelley, Extension Program Specialist II

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

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Rickey Bearden - Plains
James Brown - Muleshoe

Picker vs Stripper Comparison

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Texas AgriLife Extension Service
Lubbock, TX

Summary

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 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 weigh wagon with integral electronic scales. Modules were followed through the ginning process to determine lint turnout, USDA-AMS fiber quality, and CCC loan value. Three producer-cooperator locations were utilized for this project. Trials were planted in Parmer, Crosby and Yoakum counties. Plans were to embed picker and stripper harvester comparisons for five common entries at the Parmer and Yoakum County sites. Plot sizes were increased to facilitate this at both locations. These sites were planted according to plans and unfortunately were hailed out in mid June. The remaining Crosby County site encountered significant drought stress and center pivot malfunctions which resulted low yields and the inability to build modules of sufficient density for safe transport. The Crosby County site was, however, grab sampled and the results indicated that there was a difference in net value after ginning of $88.63 when comparing the highest and lowest entries. Two new varieties were in the top tier of statistical significance (Deltapine 174RF and All-Tex Epic RF). Both of these entries exhibited the highest yield and above average loan values based on ginning of the grab samples and HVI results from the Fiber and Biopolymer Research Institute. Plans in 2009 are to move the Crosby County trial to another location which has more land area and to execute harvester comparisons across several common entries at the other two sites. Additional multi-site and multi-year applied research is needed to evaluate varieties across a series of environments.

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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 3 million in 2007. 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/AFD/Stoneville brands, and the Dow AgroSciences PhytoGen brand.

More transgenic varieties in 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. This technology was available in a limited number of varieties including some containing Bollgard II "stacked" with Roundup Ready. 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 each location. 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). At the Muleshoe location, plots were doubled in size (from 12 30-inch rows to 24 30-inch rows) to facilitate differential harvest methods (12 rows harvested with picker and 12 rows harvested with stripper). At the Plains location 5 of the 15 varieties (common with those at the Muleshoe location) were doubled in size (12 40-inch rows to 24 40-inch rows) for picker vs. stripper comparison at harvest. A randomized complete block design was used at all three locations. Unfortunately, both the Muleshoe and Plains locations were hailed out early in the growing season. Preplant incorporated and/or preemergence herbicide applications were made at the discretion of the producer-cooperator. At the remaining site, Blanco, all varieties were Roundup Ready Flex, Bollgard II/Roundup Ready Flex stacked, or Widestrike/Roundup Ready Flex stacked; therefore, no differential herbicide applications were made. Broadcast over-the-top and post-directed herbicide applications were made by the cooperator when needed. Weed species spectrum was determined by project personnel working with the cooperator. Blanket applications of insecticides, plant growth regulators (PGRs) were not applied at this location. Harvest aids were applied by the cooperator as needed at this location.

In-season plant mapping data were derived from mapping 10 representative plants/plot for a total of 30 plants/variety. Plot weights were determined at harvest using a weigh wagon with integral electronic scales. Due to lack of harvested bur cotton, individual variety modules were not feasible. Instead, 4 3-lb grab samples were taken per plot and ginned on a small scale laboratory gin at the Lubbock Texas AgriLife Research and Extension Center to determine lint and seed turnout. Subsequent lint samples were submitted to the Texas Tech University Fiber and Biopolymer Research Institute for HVI fiber analysis and Commodity Credit Corporation (CCC) loan values were determined. 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.

Three producer-cooperator locations were initiated for this project.

Location 1 - Muleshoe (Parmer County)

James Brown Farm, near Muleshoe (Parmer County)
Clean tillage following corn
Irrigation: Low elevation spray, straight rows
Plot size: 24 30-inch rows (12 to be harvested with Picker and 12 to be harvested with Stripper)
Area: Variable (1.0 to 1.8 acres/plot), 3 replications of each variety/harvest method
Planted: May 10 at 4.2 seed/per row-ft, or ~73,000 seed/acre.
Site hailed out on June 17.

Varieties planted at this site included:

1. All-Tex Summit B2RF
2. Deltapine 121RF
3. FiberMax 9058F
4. FiberMax 9180B2F
5. Stoneville 4498B2RF
6. PhytoGen 375WRF

Location 2 - Plains (Yoakum County)

Rickey Bearden Farm, Plains (Yoakum County)
Clean-tillage following cotton
Irrigation: Low elevation spray, straight rows
Plot Size: 12 40-inch rows/plot (24 40-inch rows for varieties common with Muleshoe for Picker vs Stripper comparisons)
Area: Variable (0.8 to 2.4 acres/plot), 3 replications of each variety and variety/harvest method
Planted: May 23 at 4 seed/per row-ft, or 52,272 seed/acre
Site hailed out on June 17.

Varieties planted at this site included:

1. All-Tex Epic RF
2. Deltapine 174RF
3. FiberMax 9058F*
4. NexGen 3410RF
5. All-Tex Summit B2RF*
6. Croplan Genetics 3220B2RF
7. Dyna-Gro 2570B2RF
8. Deltapine 0935B2RF
9. FiberMax 1740B2F
10. FiberMax 9180B2F*
11. NexGen 3348B2RF
12. PhytoGen 375WRF*
13. Stoneville 4498B2RF*
14. Stoneville 4554B2RF

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

Location 3 - Blanco (Crosby County)

Appling Farm, near Blanco (Crosby County)
Reduced tillage following cotton
Irrigation: LEPA, circular rows
Plot Size: 8 40-inch rows/plot
Area: Variable (0.8 to 1.5 acres/plot), 3 replications of each variety
Planted: May 19 at 3.2 seed/per row-ft, or ~42,000 seed/acre
Harvested: November 4 and 5, 2008

Varieties planted at this site included:

1. All-Tex Epic RF
2. Deltapine 174RF
3. FiberMax 9058F
4. NexGen 3410RF
5. All-Tex Apex B2RF
6. All-Tex Summit B2RF
7. AFD 5065B2F
8. Deltapine 164B2RF
9. FiberMax 9160B2F (tested as BCSX 4366B2F)
10. FiberMax 9180B2F
11. NexGen 3348B2RF
12. PhytoGen 375WRF
13. Stoneville 4498B2RF

Weed Control Program: $58.75/acre

Dominant weed species: pigweed, silverleaf nightshade, morningglory, kochia, lanceleaf sage

Blanket herbicide applications were made by the producer via ground rig at this location. A preplant incorporated application of 1.5 pt/acre trifluralin was made on April 15. Applications of 1.0 qt/acre Glyphos Xtra (glyphosate) were made on June 14 and July 20 with AMS, an additional application of Roundup Power Max (glyphosate) was made on August 11. A single cultivation was conducted on July 26 for control of volunteer Roundup Ready and Roundup Ready Flex cotton. No hoeing was conducted at this site for weed control.

Insect Control Program: $0.00/acre

No insecticide applications were made at this site in 2008. 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 2008.

Harvest Aid Program: $9.60/acre

Harvest aids applied by the producer included, November 7, 0.5 oz/acre Blizzard with 1 % v/v COC.

Total input cost for this location was $68.35/acre and included all herbicide and insecticide costs (including additives) and application costs, when applicable (Table 4). This cost is not reflected in the net value/acre values in Table 2.

Results

Agronomic and economic results by variety as well as summaries of expenses incurred at the Blanco location are provided in Tables 1-4.

Location 1 - Muleshoe

This site was destroyed by hail on June 17, 2008.

Location 2 - Plains

This site was destroyed by hail on June 17, 2008.

Location 3 - Blanco

The early and late season growth characteristics are presented in Table 1. Plant stands averaged 33,602 plants/acre on June 12. Significant differences were observed among varieties for plant stand with a range from a high of 36,765 for PhytoGen 375WRF to a low of 27,966 for Stoneville 4498B2RF. No significant differences were observed among varieties for plant height, total mainstem nodes, height to node ratio, node of first sympodium, or nodes above white flower on August 8. Test average plant height was 15.7" with a range of from 13.5" for FiberMax 9160B2F to 17.2" for Deltapine 174RF. Average mainstem node numbers ranged from a high of 15.5 for FiberMax 9180B2F to a low of 14.4 for FiberMax 9160B2F. Deltapine 174RF had the greatest height to node ratio and Deltapine FiberMax 9160B2F had the smallest, 1.14 and 0.94, respectively. Average node of first sympodium across all varieties was 7.2 with a range of from 7.6 to 6.8 for FiberMax 9180B2F and 9160B2F and NexGen 3348B2RF, respectively. Significant differences were observed for number of fruiting nodes with NexGen 3348B2RF having the greatest number and FiberMax 9160B2F having the lowest, 9.3 and 7.7, respectively. Differences were also noted for NAWF counts with a test average of 4.1. NexGen 3348B2RF had the highest (4.6) and AFD 5065B2F had the lowest (3.5).

The site did not obtain mid-season rainfall and had center pivot breakdowns during a very dry July and August which resulted in the lowest yields since project initiation in 2001. After determining the weight of the three combined replicates during harvest of the first variety, it was evident that there was inadequate non-field cleaned bur cotton to build a module. A decision was made to grab sample the project at that time. With the cooperator's agreement, plans are to move this project to another larger-acreage center pivot site in 2009. This will facilitate larger plot sizes to help ensure adequate acreage to build modules in the future.

Lint turnouts of non-field cleaned bur cotton averaged 28.5% with a high of 30.9% for Deltapine 174RF and a low of 26.8% for All-Tex Summit B2RF (Table 2). Bur cotton yields ranged from 2028 lb/acre for Deltapine 174RF to 1693 lb/acre for AFD 5065B2F. Lint yields ranged from 627 lb/acre for Deltapine 174RF to 481 lb/acre for All-Tex Summit B2RF with a test average of 529 lb/acre. Lint loan values derived from Texas Tech University Fiber and Biopolymer Research Institute HVI results from the grab samples obtained indicated that values ranged from $0.5063 for PhytoGen 375WRF to $0.5468 for FiberMax 9160B2F. After totaling lint and seed value per acre and subtracting out ginning costs and

seed and technology fee costs, the net value per acre ranged from a low of $227.74 for All-Tex Summit B2RF to a high of $316.37 for Deltapine 174RF, a difference of $88.63. Deltapine 174RF was significantly greater than all other varieties in terms of net value in $/acre with the exception of All-Tex Epic RF.

Significant differences were observed for all HVI parameters reported with the exception of staple and reflectance (Rd). At this location, leaf and color grades were set at 3 and 31, respectively for determining CCC loan values. Micronaire averages ranged from 5.0 for All-Tex Apex B2RF and Deltapine 164B2RF to 4.5 for NexGen 3410RF (Table 3). Average staple reflects the drought-stressed environment and averaged only 33.9. Staple was numerically highest for FiberMax 9160B2F (35.0) and lowest for PhytoGen 375WRF (32.9). The highest average uniformity (81.6%) was observed in Stoneville 4498B2RF and NexGen 3410RF had the lowest with 78.9%. Average fiber strength values ranged from a high of 29.3 g/tex for Stoneville 4498B2RF to a low of 26.6 for Deltapine 174RF and All-Tex Summit. Elongation was highest for Stoneville 4498B2RF (11.4%) and lowest for FiberMax 9058F (8.7%). Test average reflectance was 75.4 and ranged from 77.1 (Deltapine 164B2RF) to 73.0 (NexGen 3348B2RF). The highest +b (yellowness) value was observed for All-Tex Epic RF of 9.0 and the lowest of 7.5 for FiberMax 9180B2F.

Summary

Plans for 2008 were to embed picker and stripper harvester comparisons for five common entries at the Muleshoe and Plains sites. Plot sizes were increased to facilitate this at both locations. These sites were planted according to plans and unfortunately were hailed out in mid June. The remaining Blanco site encountered significant drought stress and center pivot malfunctions which resulted in the inability to build modules of sufficient density for safe transport. The Blanco site was, however, grab sampled and the results indicated that there was a difference in net value after ginning of $88.63 when comparing the highest and lowest entries. Two new varieties were in the top tier of statistical significance (Deltapine 174RF and All-Tex Epic RF). Both of these entries exhibited the highest yield and above average loan values based on ginning of the grab samples and HVI results from the Fiber and Biopolymer Research Institute. Plans in 2009 are to move the Blanco trial to another location which has more land area and to execute harvester comparisons across several common entries at the other two sites. Additional multi-site and multi-year applied research is needed to evaluate varieties across a series of environments.

Table 1. Stand count and in season plant map results from the replicated irrigated cotton systems variety demonstration, Appling Farm, Blanco, TX, 2008.

Variety	12-Jun		8-Aug					
	Plant stand		Plant height	Total mainstem	Height/node	Node of first	Total fruiting	Nodes above first
	#/row ft	#/acre	inches	nodes	ratio	fruiting branch	nodes	position white flower
AFD 5065B2F	2.5	32,234 bcd	15.0	14.57 cd	1.02	7.43 ab	8.13 cd	3.5
All-Tex Apex B2RF	2.6	34,500 abc	16.5	15.00 abc	1.10	7.20 abcd	8.80 abc	4.1
All-Tex Epic RF*	2.7	35,632 ab	16.2	15.03 abc	1.07	7.47 a	8.57 abc	4.2
All-Tex Summit B2RF	2.3	30,405 de	14.7	14.80 bcd	0.99	6.87 cd	8.93 ab	4.5
Deltapine 164B2RF	2.7	34,761 ab	16.9	15.30 ab	1.10	7.30 abc	9.00 ab	4.1
Deltapine 174RF	2.7	35,371 ab	17.2	15.00 abc	1.14	7.47 a	8.53 abc	4.0
FiberMax 9058F	2.7	34,761 ab	16.2	14.87 bcd	1.09	7.37 abc	8.50 bc	4.1
FiberMax 9160B2F*	2.6	34,238 abc	13.5	14.37 d	0.94	7.63 a	7.73 d	4.4
FiberMax 9180B2F	2.6	33,977 abcd	15.2	15.50 a	0.98	7.63 a	8.87 abc	3.9
NexGen 3348B2RF	2.4	30,928 cde	14.9	15.03 abc	0.99	6.77 d	9.27 a	4.6
NexGen 3410RF	2.7	35,284 ab	16.4	14.83 bcd	1.10	6.87 cd	8.97 ab	4.0
PhytoGen 375WRF	2.8	36,765 a	16.5	14.93 bc	1.10	6.93 bcd	9.00 ab	4.0
Stoneville 4498B2RF	2.1	27,966 e	14.5	14.67 cd	0.99	7.27 abcd	8.40 bcd	4.2
Test average	2.6	33,602	15.7	14.92	1.05	7.25	8.67	4.1
CV, %	6.6	6.6	11.8	2.4	10.6	5.0	5.1	12.3
OSL	0.0027	0.0027	0.4328	0.0749†	0.4561	0.0640†	0.0212	0.5358
LSD 0.05	0.3	3,757	NS	0.51	NS	NS	0.75	NS

Means within a column with the same letter are not significantly different.
Plant map 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.

*FM 9160B2F tested as BCSX4366B2F
*All-Tex Epic RF tested as All-Tex 65333RF

Table 2. Harvest results from the replicated irrigated cotton systems variety demonstration, Appling Farm, Blanco, TX, 2008.

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 174RF	30.9	40.6	2028	627	823	0.5370	337.30	82.27	419.57	60.84	42.36	316.37 a
All-Tex Epic RF*	29.7	41.5	2025	602	840	0.5328	321.22	84.01	405.23	60.74	34.57	309.91 ab
PhytoGen 375WRF	29.8	40.6	2005	597	815	0.5063	301.86	81.46	383.32	60.15	49.14	274.04 bc
FiberMax 9160B2F*	29.1	42.3	1858	540	785	0.5468	295.51	78.53	374.04	55.74	51.01	267.28 cd
NexGen 3410RF	28.8	40.9	1758	506	719	0.5290	267.90	71.89	339.79	52.75	34.35	252.69 cde
All-Tex Apex B2RF	27.1	41.2	1871	506	771	0.5458	276.28	77.12	353.40	56.14	46.10	251.15 cde
Deltapine 164B2RF	27.0	43.8	1909	516	835	0.5310	273.96	83.54	357.50	57.28	49.70	250.52 cde
Stoneville 4498B2RF	27.7	41.7	1860	516	774	0.5312	274.08	77.44	351.52	55.81	50.56	245.15 cde
NexGen 3348B2RF	27.5	38.6	1865	512	721	0.5292	271.37	72.07	343.44	55.95	46.80	240.69 cde
FiberMax 9058F	28.9	40.0	1718	497	687	0.5203	258.32	68.72	327.04	51.55	43.68	231.81 de
FiberMax 9180B2F	28.0	40.9	1747	489	715	0.5343	260.90	71.46	332.36	52.42	51.01	228.93 de
AFD 5065B2F	28.6	44.6	1693	484	755	0.5153	249.15	75.50	324.66	50.77	45.76	228.12 e
All-Tex Summit B2RF	26.8	42.7	1794	481	766	0.5213	251.09	76.58	327.67	53.82	46.10	227.74 e
Test average	28.5	41.5	1856	529	770	0.5293	279.92	76.97	356.89	55.69	45.47	255.72
CV, %	5.2	3.2	7.1	7.2	7.2	3.4	7.7	7.2	7.4	7.1	--	9.0
OSL	0.0545†	0.0010	0.0468	0.0005	0.0320	0.3396	0.0007	0.0318	0.0020	0.0466	--	0.0005
LSD	2.1	2.2	222	64	93	NS	36.31	9.30	44.78	6.67	--	38.66

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.
$200/ton for seed.
Value for lint based on CCC loan value from grab samples and FBRI HVI results.

*FM 9160B2F tested as BCSX4366B2F
*All-Tex Epic RF tested as All-Tex 65333RF

Table 3. HVI fiber property results from the replicated irrigated cotton systems variety demonstration, Appling Farm, Blanco, TX, 2008.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Rd	+b
	units	32^{nds} inches	%	g/tex	%	reflectance	yellowness
AFD 5065B2F	4.6	33.6	79.3	27.8	10.3	74.5	7.6
All-Tex Epic RF*	4.9	33.9	81.3	27.4	11.3	75.3	9.0
All-Tex Apex B2RF	5.0	34.8	79.5	27.3	10.4	76.3	8.0
All-Tex Summit B2RF	4.7	33.4	80.5	26.6	10.3	76.8	8.0
Deltapine 164B2RF	5.0	34.1	80.2	27.9	9.7	77.1	8.4
Deltapine 174RF	4.9	34.3	80.0	26.6	10.5	75.4	8.4
FiberMax 9058F	4.8	33.8	79.1	27.8	8.7	75.5	7.9
FiberMax 9160B2F*	4.8	35.0	81.0	29.2	8.9	76.7	7.7
FiberMax 9180B2F	4.9	34.0	79.6	28.6	9.6	75.2	7.5
NexGen 3348B2RF	4.7	33.4	79.6	27.0	9.6	73.0	8.3
NexGen 3410RF	4.5	33.9	78.9	27.9	9.4	73.1	8.8
PhytoGen 375WRF	4.9	32.9	79.3	26.8	10.5	75.7	8.4
Stoneville 4498B2RF	4.8	34.0	81.6	29.3	11.4	76.0	8.4
Test average	4.8	33.9	80.0	27.7	10.1	75.4	8.2
CV, %	3.2	2.5	1.1	2.5	2.3	2.3	4.4
OSL	0.0131	0.2579	0.0156	0.0003	<0.0001	0.1533	0.0007
LSD	0.3	NS	1.5	1.2	0.4	NS	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.

*FM 9160B2F tested as BCSX4366B2F
*All-Tex Epic RF tested as All-Tex 65333RF

Table 4. Total blanket inputs costs for the replicated irrigated cotton systems variety demonstration, Appling Farm, Blanco, TX, 2008.

Weed control program		Application method	Chemical cost $/acre	Application $/acre	Total cost $/acre
15-Apr	1.5 pt/acre trifluralin	Pre-plant Incorporated		$ 5.00	$ 5.00
14-Jun	1 qt/acre Glyphos X-tra	Ground	$ 8.75	$ 5.00	$ 13.75
20-Jul	1 qt/acre Glyphos X-tra	Ground	$ 8.75	$ 5.00	$ 13.75
26-Jul	Cultivation	Ground	$ -	$ 5.00	$ 5.00
11-Aug	22 oz/acre Roundup Power-Max	Ground	$ 16.25	$ 5.00	$ 21.25
Total Blanket Base Weed Control Program					$ 58.75
Insecticide program					
No insecticides were applied at this location					
Total Blanket Insecticide Program					$ -
PGR program					
No PGRs were applied at this location					
Total Blanket PGR program					$ -
Harvest aid program					
7-Nov	0.5 oz/acre Blizzard	Ground	$ 3.50	$ 5.00	$ 9.60
	1 %v/v COC		$ 1.10		
Total Blanket Harvest Aid Program					$ 9.60
Total blanket input cost ($/acre)					$ 68.35

Replicated Large Plot Picker vs. Stripper Harvester Comparisons

AgriLIFE EXTENSION
Texas A&M System

2008 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 advent 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 2008, picker vs. stripper harvester comparisons were established within the Systems Variety Tests at Muleshoe (on the James Brown Farm) and Plains (on the Rickey Bearden Farm) to help address these questions. As a follow-up to the 2007 project, the 2008 trials were planned to double plot sizes of 6 entries at Muleshoe and 5 entries at Plains to facilitate commercial harvest, module construction, and commercial ginning of both picker and stripper harvested plots. Other researchers involved in this project were Dr. Brock Faulkner, Texas AgriLife Research agricultural engineer at College Station, and Dr. John Wanjura, with the USDA-Agricultural Research Service (ARS) Cotton Production and Processing Unit 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

The Muleshoe project was planted on May 10. Six varieties developed specifically for picker harvesting were planted at Muleshoe on which to conduct both picker and stripper harvesting. Those included:

1. Deltapine 121RF
2. FiberMax 9058F
3. FiberMax 9180B2F
4. All-Tex Summit B2RF
5. PhytoGen 375WRF
6. Stoneville 4498B2RF

The Plains site was planted on May 23, and included the following varieties which were to be both picker and stripper harvested:

1. All-Tex Summit B2RF
2. PhytoGen 375WRF
3. FiberMax 9180B2F
4. Stoneville 4498B2RF
5. FiberMax 9058F

An additional ten varieties were included at Plains which were to be used only for stripper harvesting. There were five varieties in common at both sites which would have both picker and

stripper harvesting performed. Both sites would have sufficient land area to build modules for each variety and harvester type. The varieties were planted in 12-row plots at both sites and were replicated three times across each location.

Unfortunately, a weather event (hail, high wind, rain) destroyed stands at both sites on June 17. Therefore, discussion was implemented to determine the best course of action. It was decided to use producer fields planted to a single variety and to build multiple modules with both the picker and stripper harvester at each site. Near harvest, four sites were identified with consent of producer-cooperators. Those included:

Acuff – Brady and Jerry Mimms, CEA-ANR Mark Brown
Subsurface drip irrigated, planted to FiberMax 1880B2F
Harvested on November 2
Picker harvester was a John Deere 9986 basket picker provided by a custom harvester. Stripper harvester was a John Deere 7460 with field cleaner provided by the cooperators. Ginning was performed at the Acuff McClung Co-op Gin, Rex Tomlinson, Manager.

Ralls – Steve, Eddie, and Heath Verett (no Extension agents in county)
Subsurface drip irrigated, planted to FiberMax 9180B2F
Harvested on November 10
Picker harvester was a John Deere 9996 basket picker on lease to USDA-ARS from John Deere. Stripper harvester was a John Deere 7460 with field cleaner provided by the cooperators. Ginning was performed at the Owens Co-op Gin, Steve Newton, Manager.

Muleshoe – Kelly Kettner, CEA-ANR Curtis Preston, and EA-IPM Monti Vandiver
Low energy precision application center pivot, planted to FiberMax 9150F
Harvested on November 13
Picker harvester was a John Deere 9996 basket picker on lease to USDA-ARS from John Deere. Stripper harvester was a John Deere 7445 **without a field cleaner** provided by the cooperator. Ginning was performed at the Muleshoe Co-op Gin, Darwin Robertson, Manager.

Plains – Rickey Bearden, CEA-ANR J.W. Wagner
Low elevation spray application center pivot, planted to FiberMax 9180B2F
Harvested December 2 and 3
Picker harvester was a John Deere 9996 basket picker on lease to USDA-ARS from John Deere. Stripper harvester was a John Deere 7460 with field cleaner provided by the cooperator. Ginning was performed at the New Tex Gin, Ron Craft, Owner.

All sites were large plot, randomized and replicated. Each plot consisted of enough harvested area to build one module. Plot size varied by location. The Acuff (1250 ft) and Ralls (2740 ft) sites had rectangular plots and were very uniform. The Muleshoe and Plains sites had variable plot size due to center pivot irrigation, and had considerably more variability across the field. Total modules generated varied with 3 replicates of each harvester type at Muleshoe (6 total modules; 3 picker and 3 stripper) and 4 replicates at Acuff, Ralls, and Plains (8 total modules; 4 picker and 4 stripper).

Cooperating ginners were asked to gin each module separately, which included clearing the module feeder and ejecting any remnant bales from the bale press. This provided for excellent estimates of lint turnout and yield. Since the entire harvested plot area was placed into a module, the amount of lint divided by the acreage of the plot provided yield in lbs/acre. All ginners agreed to modify the gin stream for picker harvested modules, which included bypassing of 2 stick machines, and using only one stage of lint cleaning. The usual or "normal" gin stream was used

for stripper harvested modules. Commercial classing was performed by the respective USDA-AMS Classing Office.

In order to more fully determine fiber quality and spinning characteristics, one bale per module from each site, except Muleshoe, was purchased by the Texas Tech University Fiber and Biopolymer Research Institute. These bales will provide 4 replicates per location of both picker and stripper harvested cotton with corresponding appropriate ginning. Fiber quality will be analyzed in a detailed manner using Advanced Fiber Information System (AFIS) testing and spinning tests will be conducted.

In addition to the above mentioned commercial ginning, a large "grab sample" weighing approximately 300 pounds was also taken from each harvested plot to be ginned at the USDA-ARS Cotton Production and Processing Unit at Lubbock. Approximately 50 lbs of lint from these samples will be submitted to the Texas Tech University Fiber and Biopolymer Research Institute for more detailed fiber quality analyses. These results are not reported.

Commodity Credit Corporation (CCC) 2008 loan values were calculated based on the HVI fiber properties. In 2008, ginning costs were established at $3.00/cwt and seed values were set at $200/ton. For harvesting cost comparisons, custom harvesting rates of $0.10/lint-lb for spindle picking and $0.07/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.** All acquired quantitative data were subjected to analysis of variance.

Results and Discussion

Acuff Site

Results from the Acuff site are presented in Tables 1 and 2. This site was very uniform due to subsurface drip irrigation and standardized plot sizes. Lint turnout was increased by 5%, and seed turnout increased by 6% with picker harvesting (Table 1). Picker harvesting reduced by 1160 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 124 lb/acre by picker harvesting (1694 lb/acre) when compared to stripper harvesting (1817 lb/acre). Due to the reduction in the amount of seed cotton harvested, seed yield was also reduced by 199 lb/acre by the picker harvester. Significant differences were observed in CCC loan value for lint when comparing harvester methods and the overall loan value was increased at this site by $0.0465/lb by picker harvesting. When combining lint and seed values into total value, picker harvesting resulted in about $3/acre less income. Reduced ginning cost associated with the picker was about $35/acre). When custom harvesting cost is assumed at $0.10/lint-lb for picking and $0.07/lint-lb for stripper harvesting, the overall net value per acre is about $11 lower for picker harvesting than stripper harvesting at this site, however this comparison was not statistically significant.

When picker harvesting, the HVI fiber data indicated significant improvements in some fiber quality characteristics when averaged across commercially ginned and classed bales at this location in 2008 (Table 2). Micronaire was improved by 0.3 units and moved the overall value from a 3.4 (-245 point discount) to 3.7 (+15 point premium). Staple and strength were not affected by harvester method. However, uniformity and leaf grade were slightly improved. Color grades were similar with the majority 31 and 41. Bark contamination was present in about 82% of the stripper harvested bales and was present in only 6% of the picker harvested bales. Level 1 bark contamination was a -225 point discount in the loan chart in 2008. At this site, benefits from picker harvesting provided significant improvements in HVI quality in 2008.

Ralls Site

Results from the Ralls site are presented in Tables 3 and 4. This site was very uniform due to subsurface drip irrigation and standardized plot sizes. Lint turnout was increased by 5.6%, and seed turnout increased by 5.9% with picker harvesting (Table 3). Picker harvesting reduced by 1275 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 122 lb/acre with picker harvesting (1774 lb/acre) when compared to stripper harvesting (1896 lb/acre). Due to the reduction in the amount of seed cotton harvested, seed yield was also reduced by 311 lb/acre by the picker harvester. Significant differences were observed in CCC loan value for lint when comparing harvester methods and the overall loan value was increased at this site by $0.0170/lb by picker harvesting. When combining lint and seed values into total value, picker harvesting resulted in about $68/acre less income. Reduced ginning cost associated with the picker was about $38/acre. When custom harvesting cost is assumed at $0.10/lint-lb for picking and $0.07/lint-lb for stripper harvesting, the overall net value per acre is about $74 lower for picker harvesting than stripper harvesting at this site, a statistically significant difference.

When picker harvesting, the HVI fiber data indicated improvements in some fiber quality characteristics when averaged across commercially ginned and classed bales at this location in 2008 (Table 4). Micronaire was not improved at this site. Staple, strength, and leaf were not affected by harvester method. However, uniformity was slightly improved by picker. Color grades were similar with the majority 21 and 31. Bark contamination was present in about 76% of the stripper harvested bales and was present in only 6% of the picker harvested bales. At this site benefits from picker harvesting provided slight improvements in HVI quality in 2008, mostly attributed to reduced bark contamination.

Muleshoe Site

Results from the Muleshoe site are presented in Tables 5 and 6. This site was very immature, lacked substantial boll exertion (locks held more tightly in poorly exerted bolls for picker harvesting), and displayed some lack of uniformity due to LEPA irrigation and corresponding variable plot sizes. The field was a small LEPA half-circle and only 3 replicates of each harvester type were possible. **The stripper harvester used at this site did not have a field cleaner.** As a result, lint turnout was increased by 12%, and seed turnout increased by 16% with picker harvesting (Table 5). Picker harvesting reduced by 3104 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. When averaged across the 3 replicates, lint yield was reduced by 254 lb/acre with picker harvesting (1213 lb/acre) when compared to stripper harvesting (1467 lb/acre). The first plot harvested by the picker was replicate 1. Some field adjustment was performed at the onset, and groundspeed was set at 4 mph. After making several adjustments to the machine, and reducing the ground speed to 3.2 mph, the remainder of replicate 1 and the second and third replicates were harvested. Replicate 1 had substantial field loss behind the picker and skewed the results. If the average of replicates two and three are used for the comparison, the amount of field loss for the picker was 148 lb/acre when compared to the stripper. Due to the reduction in the amount of seed cotton harvested, seed yield was also reduced by 480 lb/acre by the picker harvester. If replicates two and three are averaged, this loss was 326 lb/acre. Significant differences were observed in CCC loan value for lint when comparing harvester methods and the overall loan value was increased at this site by $0.0597/lb by picker harvesting. When combining lint and seed values into total value, picker harvesting resulted in about $79/acre less income, however, due to yield and harvester adjustment variability, this is not statistically significant. Reduced ginning cost associated with the picker was about $93/acre. When custom harvesting cost is assumed at $0.10/lint-lb for picking and $0.07/lint-lb for stripper harvesting, the overall net value per acre is about $5 lower for picker harvesting than

stripper harvesting at this site. Due to yield and harvester adjustment variability, this is not a statistically significant difference.

When picker harvesting, the HVI fiber data indicated significant improvements in some fiber quality characteristics when averaged across commercially ginned and classed bales at this location in 2008 (Table 6). Micronaire was improved by 0.3 units and moved the overall value from a 2.3 (-960 point discount) to 2.6 (-925 point discount). This level of micronaire indicates substantial immaturity at this site, and although picker harvesting did result in somewhat of an improvement, it did not result in a large benefit in loan value due to this quality component. Staple was improved by 1 32nd of an inch and uniformity was improved by 1.8% by picker harvesting. Strength and leaf were not affected by harvester method. Color grades were improved by picker harvesting which had a majority 21 and 31 color compared to the stripper harvester with all bales classed as 22 color. Bark contamination was present in about 82% of the stripper harvested bales and was present in only 3% of the picker harvested bales. At this site benefits from picker harvesting provided significant improvements in some HVI quality characteristics in 2008, mostly attributed to improved staple, uniformity, color, and reduced bark contamination.

Plains Site

Results from the Plains site are presented in Tables 7 and 8. This site was relatively immature, lacked adequate boll exertion (locks held more tightly in poorly exerted bolls for picker harvesting), and displayed some lack of uniformity due to a rolling field, LESA irrigation and corresponding variable plot sizes. Lint turnout was increased by 6%, and seed turnout increased by about 7% with picker harvesting (Table 7). Picker harvesting reduced by 1235 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. When averaged across the 4 replicates, lint yield was reduced by 156 lb/acre with picker harvesting (1004 lb/acre) when compared to stripper harvesting (1160 lb/acre). Due to the reduction in the amount of seed cotton harvested, seed yield was also reduced by 324 lb/acre by the picker harvester. Both lint and seed yield differences were not statistically significant at this site due to field variability and variable plot sizes. Significant differences were observed in CCC loan value for lint when comparing harvester methods and the overall loan value was increased at this site by $0.0491/lb by picker harvesting. When combining lint and seed values into total value, picker harvesting resulted in about $59/acre less income, however, due to yield variability, this is not statistically significant. Reduced ginning cost associated with the picker was about $37/acre. When custom harvesting cost is assumed at $0.10/lint-lb for picking and $0.07/lint-lb for stripper harvesting, the overall net value per acre is about $41 lower for picker harvesting than stripper harvesting at this site. Due to yield variability, this is not a statistically significant difference.

When picker harvesting, the HVI fiber data indicated significant improvements in most fiber quality characteristics when averaged across commercially ginned and classed bales at this location in 2008 (Table 8). Micronaire was improved by 0.3 units and moved the overall value from a 3.1 (-405 point discount) to 3.4 (-245 point discount). This level of micronaire indicates immaturity at this site, and picker harvesting resulted in an improvement of $0.0160 in loan value due to this quality component. Staple was slightly improved by 0.4 32nd of an inch and uniformity was improved by 0.5% by picker harvesting. Strength was not affected by harvester method and leaf was slightly improved by picker harvesting. Color grades were perhaps slightly improved by picker harvesting, but neither method resulted in color grades better than 21 to 31. Bark contamination was present in about 95% of the stripper harvested bales and was present in only 8% of the picker harvested bales. At this site benefits from picker harvesting provided significant improvements in some HVI quality characteristics in 2008, mostly attributed to improved micronaire, staple, uniformity, and reduced bark contamination.

Summary and Conclusions

The 2008 crop year was challenged by high temperatures and winds during much of the stand establishment period. Later in September, cool temperatures resulted in poor heat unit accumulation which had a detrimental impact on fiber maturity. Rainfall during September and October coupled with immaturity compounded the problems. A somewhat early freeze on October 23 capped the growing season. The immature crop, which had considerable tender, succulent plants, then produced the highest bark contamination since 1991. Exhibiting marginal micronaire and high bark contamination potential, 2008 was a year where fiber quality improvements should be observed when picking compared to stripping.

Improvements in HVI 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 units when compared to stripping at 3 sites, and was unaffected at the other. Staple was significantly improved by picking at two sites, and ranged from 0.4 to 1 1/32nd inch longer. Higher uniformity was observed due to picking at all sites and ranged from a difference of 0.3 to 1.8% (very immature cotton at that site). Strength was essentially unaffected by harvesting methods at all sites. Leaf grades were slightly better due to picker harvest at 3 of the 4 sites and ranged from a difference of 0.2 to 0.6 units. Color grades were generally slightly better at all sites with picker harvesting, and lint at the very immature location was shifted from the light spot category (with stripper) to the white category (with picker). Bark contamination was substantially reduced by picker harvesting at all sites (6, 6, 4, and 8% for an average of about 6%) when compared to stripper harvesting (82, 76, 82, and 95% for an average of about 84%). Gains in lint loan value were $0.0465, $0.0170, $0.0597, and $0.0491 per pound at Acuff, Ralls, Muleshoe, and Plains, respectively.

When averaged across replications and compared to stripper harvesting, lint yield was reduced by picking by 124, 122, 254 and 156 lb/acre, respectively at Acuff, Ralls, Muleshoe, and Plains. Corresponding reductions in seed yields on a per acre basis were also observed at all sites. Although field and plot area variability adversely affected analysis of the data at two sites (Muleshoe and Plains), since these data came from a known land area from which modules were built, this is what actually occurred. Picker harvesting exhibited a positive impact on gin turnouts. At the 3 sites where field cleaners were utilized on the stripper harvester, lint turnouts were substantially increased (5.0, 5.6, and 6% for an average of 5.5%). 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 using the 2008 CCC loan value for lint and factoring these components into the analysis where extremely uniform trials were established (Acuff and Ralls), the overall net value/acre (when using custom harvest rates of $0.10 for picking and $0.07 for stripping) did not indicate any advantage to picker harvesting. **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 and/or defoliant treatment is required for picker as opposed to stripper harvest). None of these potential management changes were addressed in this work. Additionally, 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.

Acknowledgments

We wish to express our appreciation to John Deere for providing access to the 9996 picker through a generous lease to USDA-ARS at Lubbock. Also, we thank the producer-cooperators: Brady and Jerry Mimms; Steve, Eddie and Heath Verett; Kelly Kettner, and Rickey Bearden for providing the cotton, equipment and time to conduct these projects. Without the generous support and detailed ginning of the ginner-cooperators this work would not have been possible. Our thanks are extended to Rex Tomlinson at Acuff-McClung Co-op, Steve Newton at Owens Co-op Gin at Ralls, Darwin Robertson at Muleshoe Co-op Gin, and Ron Craft at New Tex Gin at Plains.

Table 1. Harvest results from the replicated picker vs. stripper harvester demonstration, Brady Mimms Farm, Acuff, TX, 2008.

Harvest 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	36.0	49.4	4714	1694	2328	0.5514	933.56	232.81	1166.37	141.43	169.36	855.58
Stripper	30.9	43.0	5874	1817	2527	0.5049	917.09	252.73	1169.82	176.22	127.21	866.39
Difference (picker - stripper)	5.0	6.4	-1160	-124	-199	0.0465	16.47	-19.92	-3.45	-34.79	42.15	-10.82
CV, %	1.4	1.6	4.1	3.7	3.9	2.8	6.2	3.9	5.7	4.1	6.4	6.4
OSL	0.0006	0.0011	0.0048	0.0745	0.0603	0.0220	0.7112	0.0603	0.9463	0.0048	0.0026	0.7978
LSD (0.10)	0.8	1.2	362	108	159	0.0250	NS	15.92	NS	10.86	10.64	NS

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference 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.
$200/ton for seed.
*Harvest cost = Picker at $0.10/lint lb ; Stripper at $0.07/lint lb

Table 2. Commercial classing results from the replicated picker vs. stripper harvester demonstration, Brady Mimms Farm, Acuff, TX, 2008.

Harvest method	Micronaire	Staple	Uniformity	Strength	Leaf	Bark	Color grade	
	units	32nds inches	%	g/tex	grade	%	color 1	color 2
Picker	3.7	38.4	81.6	31.1	3.6	6.3	3.4	1.0
Stripper	3.4	38.4	81.1	31.5	4.2	81.8	3.6	1.0
CV, %	1.0	0.2	0.3	0.7	2.7	27.6	--	--
OSL	0.0029	0.4950	0.0864	0.1010	0.0036	0.0031	--	--
LSD	0.1	NS	0.4	NS	0.2	20.2	--	--

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.10 level, NS - not significant.

Total Picker bales = 63 off of 18.36 acres (rep 1 = 15, rep 2 = 15, rep 3 = 17, rep 4 = 16; 4.59 acres per rep)
Total Stripper bales = 44 off of 12.24 acres (rep 1 = 11, rep 2 = 11, rep 3 = 11, rep 4 = 11; 3.06 acres per rep)

Table 3. Harvest results from the replicated picker vs. stripper harvester demonstration, Eddie and Steve Verett Farm, Ralls, TX, 2008.

Harvest 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	36.4	52.8	4879	1774	2573	0.5653	1003.01	257.33	1260.33	146.36	177.42	936.55	a
Stripper	30.8	46.9	6153	1896	2884	0.5483	1039.51	288.43	1327.94	184.60	132.71	1010.64	b
Difference (picker - stripper)	5.6	5.9	-1275	-122	-311	0.0170	-36.50	-31.10	-67.61	-38.24	44.72	-74.08	
CV, %	0.5	0.9	1.8	2.1	2.3	1.1	2.7	2.3	2.5	1.8	2.2	2.8	
OSL	<0.0001	0.0004	0.0003	0.0204	0.0063	0.0305	0.1540	0.0063	0.0617	0.0003	0.0003	0.0298	
LSD (0.10)	0.3	0.8	162	63	107	0.0103	NS	10.65	54.58	4.85	5.59	44.64	

For net value/acre, means within a column with the same letter are not significantly different at the 0.10 probability level.
CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference 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.
$200/ton for seed.
*Harvest cost = Picker at $0.10/lint lb ; Stripper at $0.07/lint lb

Table 4. Commercial classing results from the replicated picker vs. stripper harvester demonstration, Eddie and Steve Verett Farm, Ralls, TX, 2008.

Harvest method	Micronaire	Staple	Uniformity	Strength	Leaf	Bark	Color grade	
	units	32nds inches	%	g/tex	grade	%	color 1	color 2
Picker	3.6	37.4	81.9	30.2	3.0	5.8	2.9	1.0
Stripper	3.6	37.4	81.6	30.2	3.1	76.3	2.5	1.0
CV, %	1.1	--	0.1	1.3	5.2	43.9	--	--
OSL	0.1817	--	0.0486	0.9333	0.5472	0.0116	--	--
LSD	NS	--	0.2	NS	NS	30.0	--	--

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.10 level, NS - not significant.

Total Picker bales = 53 off of 15.10 acres (rep 1 = 13, rep 2 = 14, rep 3 = 13, rep 4 = 13; 3.77 acres per rep)
Total Stripper bales = 50 off of 13.42 acres (rep 1 = 13, rep 2 = 12, rep 3 = 13, rep 4 = 12; 3.35 acres per rep)

Table 5. Harvest results from the replicated picker vs. stripper harvester demonstration, Kelly Kettner Farm, Muleshoe, TX, 2008.

Harvest 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	34.3	50.4	3531	1213	1782	0.4694	569.66	178.19	747.85	105.94	121.28	520.62
Stripper	22.1	34.1	6636	1467	2262	0.4097	601.09	226.16	827.26	199.08	102.68	525.50
Difference (picker - stripper)	12.3	16.4	-3104	-254	-480	0.0597	-31.44	-47.97	-79.41	-93.14	18.60	-4.88
Test average	22.9	33.6	2354	808	1188	0.3129	379.77	118.79	498.56	70.63	80.86	347.08
CV, %	1.1	1.1	7.6	9.8	9.3	1.6	11.4	9.3	10.8	11.6	10.7	11.8
OSL	0.0004	0.0005	0.0102	0.1422	0.0893	0.0090	0.6231	0.0896	0.3729	0.0102	0.1986	0.9319
LSD (0.10)	0.7	1.1	922	NS	449	0.0166	NS	45.01	NS	27.66	NS	NS

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference 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.
$200/ton for seed.
*Harvest cost = Picker at $0.10/lint lb ; Stripper at $0.07/lint lb

Table 6. Commercial classing results from the replicated picker vs. stripper harvester demonstration, Kelly Kettner Farm, Muleshoe, TX, 2008.

Harvest method	Micronaire	Staple	Uniformity	Strength	Leaf	Bark	Color grade	
	units	32nds inches	%	g/tex	grade	%	color 1	color 2
Picker	2.6	37.5	79.4	28.4	3.6	2.6	2.7	1.0
Stripper	2.3	36.5	77.6	28.0	4.0	81.5	2.0	2.0
CV, %	1.6	0.1	0.4	2.0	7.4	22.3	--	--
OSL	0.0083	0.001	0.0229	0.4778	0.2254	0.0093	--	--
LSD	0.1	0.1	0.8	NS	NS	22.3	--	--

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.10 level, NS - not significant.

Total Picker bales = 39 off of 16.51 acres (rep 1 = 14, rep 2 = 12, rep 3 = 13)
Total Stripper bales = 22 off of 7.47 acres (rep 1 = 7, rep 2 = 8, rep 3 = 7)

Table 7. Harvest results from the replicated picker vs. stripper harvester demonstration, Rickey Bearden Farm, Plains, TX, 2008.

Harvest 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	33.4	50.3	3005	1004	1512	0.5536	557.67	151.19	708.86	90.14	100.41	518.31
Stripper	27.4	43.4	4239	1160	1835	0.5046	584.54	183.53	768.07	127.16	81.17	559.74
Difference (picker - stripper)	6.0	6.9	-1235	-156	-324	0.0491	-26.87	-32.35	-59.21	-37.02	19.24	-41.43
CV, %	3.8	5.1	9.9	13.6	13.8	1.6	14.7	13.8	14.5	9.9	13.9	15.7
OSL	0.0050	0.0271	0.0165	0.2322	0.1423	0.0040	0.6823	0.1419	0.4912	0.0165	0.1208	0.5375
LSD (0.10)	1.9	4.0	596	NS	NS	0.0144	NS	NS	NS	17.88	NS	NS

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference 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.
$200/ton for seed.
*Harvest cost = Picker at $0.10/lint lb ; Stripper at $0.07/lint lb

Table 8. Commercial classing results from the replicated picker vs. stripper harvester demonstration, Rickey Bearden Farm, Plains, TX, 2008.

Harvest method	Micronaire	Staple	Uniformity	Strength	Leaf	Bark	Color grade	
	units	32nds inches	%	g/tex	grade	%	color 1	color 2
Picker	3.4	37.4	81.9	29.6	2.9	8.3	2.2	1.0
Stripper	3.1	37.0	81.4	30.0	3.1	95.2	2.8	1.0
CV, %	2.8	0.3	0.3	1.1	3.0	27.4	--	--
OSL	0.0235	0.0109	0.0493	0.1487	0.0689	0.0033	--	--
LSD	0.15	0.17	0.42	NS	0.1	23.6	--	--

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.10 level, NS - not significant.

Total Picker bales = 52 off of 25.53 acres (rep 1 = 14, rep 2 = 13, rep 3 = 13, rep 4 = 12)
Total Stripper bales = 41 off of 17.31 acres (rep 1 = 10, rep 2 = 10, rep 3 = 10, rep 4 = 11)

AgriLIFE EXTENSION
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2007 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 advent 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 2007, picker vs. stripper harvester comparisons were established within the Systems Variety Tests at Muleshoe (on the James Brown Farm) and Plains (on the Rickey Bearden Farm) to help address these questions. For a review of production information for each site, see the 2007 Systems Agronomic and Economic Evaluation of Cotton Varieties in the Texas High Plains - Plains Cotton Improvement Program Final Report.

The overall project leader was Dr. Bryan Shaw, Texas AgriLife Research agricultural engineer at College Station. Two graduate students were involved in this project, including Dr. Brock Faulkner (now a Texas AgriLife Research agricultural engineer at College Station) and Dr. John Wanjura (now with the USDA-Agricultural Research Service (ARS) Cotton Production and Processing Unit at Lubbock). The objective of these trials was to assess the efficiency and fiber quality impact of picker vs. stripper harvesting at two sites across three replicates of four common varieties in the Texas High Plains.

Materials and Methods

Four varieties developed specifically for picker harvesting were planted at both Muleshoe and Plains and included for picker and stripper harvesting comparisons. These varieties were Stoneville 4554B2RF, PhytoGen 485 WRF, FiberMax 9063B2F, and FiberMax 9058F. Since these tests were designed later in the season, sufficient land area to build modules for each harvester type from each of these four varieties was not available. The varieties were planted in 12-row plots at both sites and were replicated three times across each location. It was decided to harvest six rows of each variety in each replicate with a picker and six rows with a stripper. The harvesters were assigned at random across each variety plot. The picker harvester used in these trials was a John Deere 9996 basket picker, and a John Deere 7760 stripper equipped with a field cleaner was used. The John Deere 9996 picker is leased to the USDA-ARS personnel at Lubbock, and the producers provided the John Deere 7760 strippers and other equipment. Plot sizes were 550 ft long at Plains and 800 ft long at Muleshoe. As mentioned above, each plot was six rows wide at both locations. Row spacing at Muleshoe was 30 inches and was 40 inches at Plains. Plot weights at both sites were captured using a West Texas Lee weigh wagon. A large "grab sample" weighing approximately 300 pounds was taken from each harvested plot and ginned at the USDA-ARS Cotton Production and Processing Unit at Lubbock. Seed cotton or bur cotton from both harvester types were ginned exactly alike (stripper type setup). A 50-lb lint sample from each plot was submitted to the Texas Tech University Fiber and Biopolymer Research Institute for high volume instrument (HVI), Advanced Fiber Information System (AFIS), and spinning testing. **Therefore, results from 2007 were not based on actual commercial ginning or classing.**

Commodity Credit Corporation (CCC) 2007 loan values were calculated based on the HVI fiber properties. In 2007 ginning costs were established at $2.45/cwt and seed values were set at $150/ton. For harvesting cost comparisons, custom harvesting rates of $0.10/lint-lb for spindle picking and $0.07/lint-lb for stripper harvesting were 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.** All acquired data were subjected to analysis of variance using a split-plot experimental design with three replicates. This experimental design included variety as the main plot and harvester type as the subplots.

Results and Discussion

Muleshoe Site

Results from the Muleshoe site are presented in Tables 1 and 2. The only measurement that indicated a significant variety by harvester interaction was staple length. This lack of significant variety by harvester interaction indicates that varieties performed similarly across harvester types, and for nearly all of the measured response variables, varieties can be averaged across replicates for each harvester type. Lint turnout was increased by 6.9%, and seed turnout increased by 10.7% by picker harvesting (Table 1). Picker harvesting reduced by 1252 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 about 123 lb/acre by picker harvesting (1282 lb/acre) when compared to stripper harvesting (1404 lb/acre). Due to the reduction in the amount of seed cotton harvested, seed yield was also reduced by 188 lb/acre by the picker harvester. No significant differences were observed in CCC loan value for lint when comparing harvester methods. When combining lint and seed values into total value, picker harvesting resulted in about $82/acre less income. However, this is partially offset by reduced ginning cost associated with the picker (about $30/acre). When custom harvesting cost is assumed at $0.10/lint-lb for picking and $0.07/lint-lb for stripper harvesting, the overall net value per acre is about $81 lower for picker harvesting than stripper harvesting at this site.

The HVI fiber data indicated few improvements in fiber quality at this location in 2007 (Table 2). Micronaire was slightly improved (not significant at the 0.05 level, but is at the 0.10 level), staple was increased by about 0.3 32nds of an inch, and leaf grades were slightly improved. No effects were noted on other fiber properties. Since this cotton was not commercially classed, there were no possible extraneous matter evaluations. However, based on overall crop conditions in 2007, bark contamination was very low in the entire High Plains crop that year, and no benefits from picker harvesting would likely have been observed.

Plains Site

Results from the Plains site are presented in Tables 3 and 4. No statistically significant variety by harvest method interactions were observed. Again, this lack of significant variety by harvester interaction indicates that varieties performed similarly across harvester types, and for all measured response variables, varieties can be averaged across replicates for each harvester type.

Lint turnout was increased by 4.5%, and seed turnout increased by 7% by picker harvesting (Table 3). Picker harvesting reduced by 1154 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 about 179 lb/acre by picker harvesting (1305 lb/acre) when compared to stripper harvesting (1484 lb/acre). This increased amount of lint left in the field at this site could possibly be due to less boll exertion at this site when compared with the Muleshoe location. Due to the reduction in the amount of seed cotton harvested, seed yield was also reduced by 283 lb/acre by the picker harvester. No

significant differences were observed in CCC loan value for lint when comparing harvester methods. When combining lint and seed values into total value, picker harvesting resulted in about $115/acre less income. However, this is partially offset by reduced ginning cost associated with the picker (about $28/acre). When custom harvesting cost is assumed at $0.10/lint-lb for picking and $0.07/lint-lb for stripper harvesting, the overall net value per acre is about $113 lower for picker harvesting than stripper harvesting at this site.

The HVI fiber data indicated few improvements in fiber quality at this location in 2007 (Table 4). The only significant effect was on micronaire which was slightly improved (increased) by about 0.1 units by picker harvesting. No other improvements in fiber properties were observed for picker harvesting when compared to stripper harvesting. Since this cotton was not commercially classed, there were no possible extraneous matter evaluations. However, based on overall crop conditions in 2007, bark contamination was very low in the entire High Plains crop that year, and no benefits from picker harvesting would likely have been observed.

Summary and Conclusions

The 2007 crop year produced the highest HVI quality ever obtained in the High Plains. Micronaire values were higher than in the previous several years due to a warm, open fall. No late rainfall was obtained to trigger high bark contamination or to reduce quality of color or leaf grades. In this environment, picker harvesting did not substantially improve overall HVI quality when compared to stripper harvesting at Muleshoe and Plains. When averaged across replications and the four varieties used, lint yield was reduced by 122 lb/acre by picker harvesting at Muleshoe and by 179 lb/acre at Plains, with corresponding reductions in seed yields on a per acre basis. This may be somewhat high in the 2007 environment and could be an artifact of the testing methodology used (weighing plots and ginning a large grab sample). There was minimal significant improvement in HVI fiber quality as measured by the Texas Tech University Fiber and Biopolymer Research Institute. When custom harvesting cost is assumed at $0.10/lint-lb for picking and $0.07/lint-lb for stripper harvesting, the overall net value per acre is about $81 and $115 lower for picker harvesting than stripper harvesting at Muleshoe and Plains, respectively. **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. Additionally, 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.

Acknowledgments

We wish to express our appreciation to John Deere for providing access to the 9996 picker through a lease to USDA-ARS at Lubbock; and to the producer-cooperators (James Brown and Rickey Bearden) for their support.

Table 1. Harvest results from the replicated picker vs. stripper harvester demonstration, James Brown Farm, Muleshoe, TX, 2007.

	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 ----------						
Variety													
FM 9058F	35.6	50.0	3736	1319	1852	0.5805	769.67	138.89	908.56	91.51	111.87	705.18	
FM 9063B2F	32.7	51.1	4250	1368	2138	0.5930	811.31	160.36	971.67	104.12	115.41	752.15	
PHY 485WRF	30.4	49.8	4348	1302	2133	0.5847	761.26	160.00	921.26	106.51	109.49	705.25	
ST 4554B2RF	32.1	50.7	4400	1384	2187	0.5903	816.77	164.00	980.76	107.79	116.24	756.74	
OSL	0.0005	0.5255	0.2853	0.9112	0.3295	0.2641	0.8691	0.3296	0.8387	0.2851	0.9177	0.8424	
LSD (0.05)	1.4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
Harvest method													
Picker	36.1	55.7	3557	1282	1983	0.5894	755.73	148.75	904.48	87.14	128.19	689.15	b
Stripper	29.2	45.1	4809	1404	2171	0.5848	823.77	162.88	986.65	117.82	98.31	770.52	a
Difference (picker - stripper)	6.9	10.7	-1252	-123	-188	0.0045	-68.04	-14.13	-82.16	-30.68	29.89	-81.37	
OSL	<0.0001	<0.0001	<0.0001	0.0098	0.0113	0.3029	0.0230	0.0112	0.0195	<0.0001	<0.0001	0.0105	
LSD (0.05)	1.3	2.1	184	84	132	NS	55.94	9.94	65.03	4.49	5.56	56.48	
Variety x harvest method													
OSL	0.4864	0.8609	0.0835	0.4963	0.6047	0.5109	0.4944	0.6046	0.5024	0.0838	0.3590	0.5937	
CV, %	4.1	4.5	4.7	6.6	6.8	1.7	7.5	6.8	7.3	4.7	5.2	8.2	

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:
$2.45/cwt ginning cost.
$150/ton for seed.
*Harvest cost = Picker at $0.10/lint lb ; Stripper at $0.07/lint lb
Value for lint based on CCC loan value from large grab samples and TTU-FBRI HVI results.

Table 2. High volume instrument results from the replicated picker vs. stripper harvester demonstration, James Brown Farm, Muleshoe, TX, 2007.

	Micronaire	Staple	Uniformity	Strength	Leaf	Color	
	units	32nds inches	%	g/tex	grade	color 1	color 2
Variety							
FM 9058F	4.1	36.3	80.3	29.0	1.3	2.0	1.0
FM 9063B2F	4.1	38.0	81.1	31.2	1.2	1.7	1.0
PHY 485WRF	4.1	36.4	82.8	29.8	2.3	2.3	1.0
ST 4554B2RF	3.9	36.3	81.8	29.8	1.5	2.0	1.0
OSL	0.6131	0.0312	0.0005	0.0058	0.0083	--	--
LSD (0.05)	NS	1.2	0.7	0.9	0.6	--	--
Harvest method							
Picker	4.1	36.9	81.53	29.8	1.3	2.0	1.0
Stripper	4.0	36.6	81.45	30.1	1.9	2.0	1.0
OSL	0.0536	0.0068	0.7353	0.4029	0.0285	--	--
LSD (0.05)	NS	0.2	NS	NS	0.6	--	--
Variety x harvest method							
OSL	0.3237	0.0013	0.2501	0.2116	0.8272	--	--
CV, %	3.3	0.60	0.6	2.2	38.7	--	--

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level, NS - not significant.
Based on large grab samples and TTU-FBRI HVI results.

Table 3. Harvest results from the replicated picker vs. stripper harvester demonstration, Rickey Bearden Farm, Plains, TX, 2007.

	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 ----------						
Variety													
FM 9058F	34.2	49.8	4480	1516	2209	0.5920	897.61	165.71	1063.32	109.76	127.66	825.90	a
FM 9063B2F	32.5	51.2	4303	1390	2188	0.5937	824.87	164.13	989.00	105.43	117.15	766.43	b
PHY 485WRF	30.1	48.2	4159	1246	1997	0.5742	711.79	149.79	861.57	101.91	104.38	655.29	c
ST 4554B2RF	32.7	50.4	4410	1426	2200	0.5820	829.15	165.02	994.17	108.05	119.50	766.62	b
OSL	0.0171	0.3830	0.2004	0.0131	0.1595	0.1427	0.0009	0.1590	0.0023	0.1998	0.0093	0.0016	
LSD (0.05)	2.1	NS	NS	131	NS	NS	53.43	NS	69.53	NS	10.50	54.97	
Harvest method													
Picker	34.6	53.4	3761	1305	2007	0.5890	768.90	150.54	919.44	92.15	130.49	696.80	b
Stripper	30.1	46.4	4915	1484	2290	0.5819	862.80	171.78	1034.59	120.42	103.85	810.31	a
Difference (picker - stripper)	4.5	7.0	-1154	-179	-283	0.0071	-93.90	-21.25	-115.15	-28.27	26.63	-113.51	
OSL	<0.0001	0.0034	<0.0001	0.0035	0.0215	0.1261	0.0055	0.0214	0.0067	<0.0001	<0.0001	0.0031	
LSD (0.05)	1.4	3.9	190	101	229	NS	57.45	17.17	73.19	4.66	6.91	62.82	
Variety x harvest method													
OSL	0.6923	0.9776	0.5598	0.8644	0.9686	0.4221	0.9578	0.9684	0.9628	0.5603	0.4880	0.9710	
CV, %	4.7	8.3	4.7	7.7	11.3	1.7	7.5	11.3	8.0	4.7	6.3	8.9	

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:
$2.45/cwt ginning cost.
$150/ton for seed.
*Harvest cost = Picker at $0.10/lint lb ; Stripper at $0.07/lint lb
Value for lint based on CCC loan value from large grab samples and TTU-FBRI HVI results.

Table 4. High volume instrument results from the replicated picker vs. stripper harvester demonstration, Rickey Bearden Farm, Plains, TX, 2007.

	Micronaire	Staple	Uniformity	Strength	Leaf	Color	
	units	32nds inches	%	g/tex	grade	color 1	color 2
Variety							
FM 9058F	4.0	38.7	82.3	29.2	1.3	2.0	1.0
FM 9063B2F	4.3	39.0	82.7	30.8	1.0	1.8	1.0
PHY 485WRF	4.1	36.2	83.1	28.2	2.2	2.7	1.2
ST 4554B2RF	4.1	36.4	82.3	27.9	1.2	2.0	1.2
OSL	0.1008	<0.0001	0.0051	0.0027	0.0083	--	--
LSD (0.05)	NS	0.5	0.4	1.1	0.6	--	--
Harvest method							
Picker	4.2	37.7	82.7	28.9	1.3	2.2	1.0
Stripper	4.1	37.5	82.4	29.1	1.6	2.1	1.2
OSL	0.0069	0.4025	0.2391	0.2491	0.1690	--	--
LSD (0.05)	0.07	NS	NS	NS	NS	--	--
Variety x harvest method							
OSL	0.1299	0.7256	0.7840	0.3823	0.3889	--	--
CV, %	1.8	1.0	0.7	1.8	38.1	--	--

CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level, NS - not significant.
Based on large grab samples and TTU-FBRI HVI results.

Additional Replicated Irrigated Large Plot Demonstrations

AgriLIFE EXTENSION
Texas A&M System

Replicated Subsurface Drip Irrigated Cotton Variety Demonstration, Ropesville, TX - 2008

Cooperators: Mike and Caleb Henson

Chris Edens, Kerry Siders, Randy Boman, Mark Kelley and Chris Ashbrook
CEA-ANR Hockley County, EA-IPM Cochran/Hockley Counties, Extension Agronomist - Cotton, Extension Program Specialist II - Cotton, and Extension Assistant - Cotton

Hockley County

Summary: No significant differences were noted for plant population taken on 11-June, however, significant differences were observed for most plant measurements taken on 13-August (Table 1). Furthermore, most yield and fiber quality differences were significant (Tables 2 and 3). Lint turnout ranged from 32.4%, for All-Tex Apex B2RF and Stoneville 5458B2RF, to 34.3% for PhytoGen 375WRF. Lint yields varied from 887 lb/acre to 1258 lb/acre for Deltapine 0935B2RF and PhytoGen 375WRF, respectively with a test average of 1149 lb/acre. Lint loan values ranged from a low of $0.4778/lb for Deltapine 0935B2RF, to a high of $0.5467/lb for NexGen 3348B2RF. After subtracting ginning, seed and technology fee costs, net value/acre ranged from a high of $678.28 for PhytoGen 375WRF to a low of $421.45 for Deltapine 0935B2RF, a difference of $256.83. Micronaire ranged from a low of 2.8 for Deltapine 0935B2RF, to a high of 3.5 for NexGen 3348B2RF. Staple length averaged 36.6 across all varieties with a low of 35.0 (Deltapine 0935B2RF) and a high of 38.1 (FiberMax 9180B2F and FiberMax 9063B2F). Percent uniformity ranged from a low of 78.7% for Croplan Genetics 3220B2RF to a high of 81.2% for NexGen 3348B2RF. A test average strength of 27.0 g/tex was observed and PhytoGen 375WRF produced the lowest value (25.6 g/tex) and FiberMax 9063B2F produced the highest (29.0 g/tex). 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 picker harvested transgenic cotton varieties under subsurface drip irrigated production in the Texas High Plains.

Materials and Methods:

Varieties: All-Tex Apex B2RF, Croplan Genetics 3220B2RF, Deltapine 0935B2RF, Dyna-Gro 2570B2RF, FiberMax 9063B2F, FiberMax 9180B2F, NexGen 3348B2RF, PhytoGen 375WRF, Stoneville 5458B2RF

Experimental design:	Randomized complete block with 3 replications
Seeding rate:	3.8 seeds/row-ft in 40-inch row spacing (John Deere 7300 Max Emerge vacuum planter)
Plot size:	8 rows by length of field (1265 ft long)
Planting date:	20-May
Weed management:	Two applications of 32 oz/acre Roundup Ultra Max with ammonium sulfate and NIS at 9 lbs and 1 qt, respectively, per 100 gal spray solution were made on 31-May and 22-July.
Irrigation and rainfall:	This location was pre-watered for 4 weeks prior to planting and crop irrigation started on 25-May and continued to the end of August. The subsurface drip irrigation system capacity is 3.5 gallons/acre/minute. This resulted in a total of 18.62" of irrigation for the season. According to personal correspondence with the producer, a total of 16.54" of rainfall accumulated during the growing season. Total moisture for the season was 35.16".
Insecticides:	Temik was applied in-furrow at planting at a rate of 5.0 lb/acre. This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.
Fertilizer management:	The producer applied 350 lbs/acre 16-26-0-12 pre-plant incorporated and 40 gallons/acre 32-0-0 via fertigation from 20-June to 26-July.
Plant growth regulators:	Pentia was applied at 4.0 oz/acre in a tank mix with the 31-May Roundup Ultra application.
Harvest aids:	No harvest aids were applied due to an early freeze on 23-October.
Harvest:	Plots were harvested on 22-November with a John Deere Model 7760 prototype picker with on-board moduling. Each plot was harvested and moduled separately and modules were weighed using a digital scale system with 4 platforms to determine individual plot weights. Plot weights were subsequently converted to lb/acre basis.
Gin turnout:	Grab samples were taken from each module 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 (3.8 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/seedindex.html

Results and Discussion:

No significant differences were noted for plant population taken on 11-June; however, significant differences were observed for most plant measurements taken on 13-August (Table 1). The test average plant population (plants/acre) was 35,501 with a range of from 28,691 for NexGen 3348B2RF to 43,560 for All-Tex Apex B2RF. Results from plant measurements taken on 13-August represent an average from 10 plants/plot or 30 plants/variety. Plant height ranged from a high of 30.1" for Deltapine 0935B2RF, to a low of 27.3" for FiberMax 9180B2F. Test average total number of mainstem nodes was 19.1 and resulted in an average height to node ratio of 1.49. All-Tex Apex B2RF and Dyna-Gro 2570B2RF had the lowest nodes of first fruiting branch (6.4) and Deltapine 0935B2RF had the highest (8.1). Total number of fruiting branches averaged 13.2 across all varieties and ranged from a high of 13.6 for All-Tex Apex B2RF to a low of 12.6 for PhytoGen 375WRF.

Most yield and fiber quality differences were significant (Tables 2 and 3). Lint turnout ranged from 32.4%, for All-Tex Apex B2RF and Stoneville 5458B2RF, to 34.3% for PhytoGen 375WRF. Picker harvested seed cotton yields averaged 3462 lb/acre with a high of 3708 lb/acre for FiberMax 9180B2F, and a low of 2673 lb/acre for Deltapine 0935B2RF. Lint yields varied from 887 lb/acre to 1258 lb/acre for Deltapine 0935B2RF and PhytoGen 375WRF, respectively with a test average of 1149 lb/acre. Lint loan values ranged from a low of $0.4778/lb for Deltapine 0935B2RF, to a high of $0.5467/lb for NexGen 3348B2RF. After adding lint and seed value, total value/acre for varieties ranged from a low of $560.81 for Deltapine 0935B2RF to a high of $846.87 for PhytoGen 375WRF. When subtracting ginning, seed and technology fee costs, net value/acre ranged from a high of $678.28 for PhytoGen 375WRF to a low of $421.45 for Deltapine 0935B2RF, a difference of $256.83.

Micronaire ranged from a low of 2.8 for Deltapine 0935B2RF, to a high of 3.5 for NexGen 3348B2RF. Staple length averaged 36.6 across all varieties with a low of 35.0 (Deltapine 0935B2RF) and a high of 38.1 (FiberMax 9180B2F and FiberMax 9063B2F). Percent uniformity ranged from a low of 78.7% for Croplan Genetics 3220B2RF to a high of 81.2% for NexGen 3348B2RF. A test average strength of

27.0 g/tex was observed and PhytoGen 375WRF produced the lowest value (25.6 g/tex) and FiberMax 9063B2F produced the highest (29.0 g/tex). Elongation ranged from a high of 10.9% for Dyna-Gro 2570B2RF to a low of 9.2% for Stoneville 5458B2RF. Leaf grades were mostly 1s and 2s at this location. Values for reflectance (Rd) and yellowness (+b) averaged 77.8 and 9.4, respectively. This resulted in color grades of mostly 21s and 31s 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 varieties at this location were severely affected, some more than others, by the 23-October freeze resulting in substantial yield reductions. However, no inclement weather was encountered 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 Mike and Caleb Henson for the use of their land and equipment for this demonstration and to John Deere for the use of the 7760 picker for harvest. Further assistance with this project was provided by Dr. John Gannaway - Texas AgriLife Research and Extension Center (Retired), 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. Stand count and in season plant map results from the replicated subsurface drip irrigated cotton variety demonstration, Mike Henson Farm, Ropesville, TX, 2008.

Variety	11-Jun		13-Aug						
	Plant stand		Plant height	Total mainstem	Height/node	Node of first	Total fruiting	Node of first	Nodes above first
	#/row ft	#/acre	inches	nodes	ratio	fruiting branch	nodes	position white flower	position white flower
All-Tex Apex B2RF	2.5	43,560	29.1 b	19.0 c	1.50	6.4 d	13.6 a	12.6 bcd	6.4 cd
Croplan Genetics 3220B2RF	2.0	34,383	28.1 cd	19.8 ab	1.43	7.2 b	13.5 a	12.7 bc	7.1 a
Deltapine 0935B2RF	2.2	37,636	30.1 a	20.3 a	1.50	8.1 a	13.2 abc	13.4 a	7.0 ab
Dyna-Gro 2570B2RF	2.0	35,777	28.6 bc	18.9 c	1.50	6.4 d	13.5 a	12.0 ef	7.0 ab
FiberMax 9180B2F	1.8	31,712	27.3 e	19.1 bc	1.43	6.8 c	13.3 ab	12.2 cde	6.9 abc
NexGen 3348B2RF	1.6	28,691	27.8 de	18.5 c	1.50	6.6 cd	12.9 bc	12.0 de	6.5 bcd
PhytoGen 375WRF	2.2	38,216	28.8 b	18.9 c	1.53	7.3 b	12.6 c	12.8 ab	6.1 d
Stoneville 5458B2RF	1.9	34,035	27.8 de	18.5 c	1.50	6.8 c	12.7 c	11.4 f	7.1 a
Test average	2.0	35,501	28.5	19.1	1.49	7.0	13.2	12.4	6.7
CV, %	16.6	17.0	1.2	2.0	3.2	2.5	2.9	2.7	6.1
OSL	0.1562	0.1969	<0.0001	0.0006	0.2106	<0.0001	0.0270	0.0002	0.0667†
LSD 0.05	NS	NS	0.6	0.7	NS	0.3	0.7	0.6	0.6

Means within a column with the same letter are not significantly different.
Plant map 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 subsurface drip irrigated cotton variety demonstration, Mike Henson Farm, Ropesville, TX, 2008.

Variety	Lint turnout	Seed turnout	Seed 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 ----------					
PhytoGen 375WRF	34.3	53.4	3669	1258	1959	0.5177	650.98	195.89	846.87	110.08	58.50	678.28 a
NexGen 3348B2RF	33.3	54.1	3504	1170	1898	0.5467	638.92	189.80	828.72	105.13	55.72	667.87 a
FiberMax 9180B2F	32.8	52.5	3708	1214	1946	0.5300	643.56	194.64	838.21	111.25	60.73	666.24 a
Dyna-Gro 2570B2RF	34.2	53.1	3637	1245	1933	0.5063	630.31	193.26	823.58	109.12	59.85	654.62 ab
FiberMax 9063B2F	33.3	52.9	3420	1141	1810	0.5328	608.52	180.97	789.50	102.59	60.73	626.18 ab
Croplan Genetics 3220B2RF	32.8	54.9	3528	1157	1937	0.5097	590.50	193.65	784.15	105.82	60.07	618.26 ab
All-Tex Apex B2RF	32.4	54.6	3523	1140	1922	0.5060	576.92	192.20	769.12	105.70	54.89	608.54 ab
Stoneville 5458B2RF	32.4	54.9	3493	1133	1918	0.4828	547.19	191.83	739.01	104.79	60.20	574.03 b
Deltapine 0935B2RF	33.2	51.3	2673	887	1372	0.4778	423.64	137.17	560.81	80.19	59.17	421.45 c
Test average	33.2	53.5	3462	1149	1855	0.5122	590.06	185.49	775.55	103.85	58.87	612.83
CV, %	1.7	1.6	5.2	5.2	5.1	3.8	7.5	5.1	6.8	5.2	--	7.8
OSL	0.0057	0.0009	0.0001	<0.0001	<0.0001	0.0086	0.0003	<0.0001	0.0002	0.0001	--	0.0002
LSD	1.0	1.4	312	103	165	0.0338	76.10	16.48	90.90	9.35	--	82.48

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.
Note: some columns may not add up due to rounding error.
*This location was harvested with a John Deere prototype model 7760 picker.

Assumes:
$3.00/cwt ginning cost.
$200/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 subsurface drip irrigated cotton variety demonstration, Mike Henson Farm, Ropesville, TX, 2008.

Variety	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	3.0	37.1	79.1	25.8	10.0	2.0	78.5	9.3	2.0	1.0
Croplan Genetics 3220B2RF	3.1	36.2	78.7	26.5	10.5	1.0	77.5	9.8	2.0	1.3
Deltapine 0935B2RF	2.8	35.0	79.2	26.1	9.8	1.7	78.3	9.7	2.0	1.3
Dyna-Gro 2570B2RF	3.1	36.2	79.1	26.2	10.9	1.0	77.2	10.0	2.0	1.7
FiberMax 9063B2F	3.3	38.1	80.4	29.0	9.7	2.3	80.2	8.1	2.3	1.0
FiberMax 9180B2F	3.2	38.1	80.8	28.5	10.0	1.3	80.0	8.3	2.3	1.0
NexGen 3348B2RF	3.5	36.2	81.2	27.9	10.2	1.7	76.5	9.3	3.0	1.3
PhytoGen 375WRF	3.1	36.1	80.3	25.6	9.6	1.7	77.8	9.8	2.0	1.3
Stoneville 5458B2RF	3.2	36.3	79.0	27.3	9.2	3.0	74.4	10.1	2.7	2.0
Test average	3.1	36.6	79.8	27.0	10.0	1.7	77.8	9.4	2.3	1.3
CV, %	4.4	1.9	1.5	2.3	2.6	41.6	1.1	4.3	--	--
OSL	0.0014	0.0010	0.1727	<0.0001	<0.0001	0.0690†	<0.0001	0.0001	--	--
LSD	0.2	1.2	NS	1.1	0.4	1.0	1.5	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
Texas A&M System

Replicated Subsurface Drip Irrigated Cotton Variety Demonstration, Ralls, TX - 2008

Cooperator: David Crump

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Summary: No significant differences were observed among varieties for plant population on 12-June, however, on 31-July significant differences were noted for some plant measurements recorded (Table 1). Plot sizes at this location were of sufficient size to facilitate building variety specific modules. Variety modules were subsequently ginned separately at Caprock Gin Incorporated near Ralls. Lint and seed turnouts were calculated based on resulting lint and seed from each module. Significant differences were observed for all replicated yield and economic parameters measured (Table 2). Lint turnout from commercial ginning (not replicated) ranged from a low of 30.6% to a high of 37.0% for AFD 5065B2F and Dyna-Gro 2570B2RF, respectively. Lint yields varied with a low of 1353 lb/acre (AFD 5065B2F) and a high of 1688 lb/acre (Dyna-Gro 2570B2RF). When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $973.42 (Dyna-Gro 2570B2RF) to a low of $789.47 (AFD 5065B2F), a difference of $183.95. Lint samples collected from individual bales were submitted to the USDA-AMS classing office in Lubbock for HVI analyses (Table 3). Micronaire values ranged from a low of 3.9 for Deltapine 164B2RF to a high of 4.3 for Dyna-Gro 2570B2RF and NexGen 3348B2RF. Staple length averaged 35.9 across all varieties with a low of 35.0 for PhytoGen 375WRF and Dyna-Gro 2570B2RF and a high of 37.0 for FiberMax 9180B2F. The highest percent uniformity was observed for NexGen 3348B2RF (81.7%) and AFD 5065B2F had the lowest (80.4%). Strength values averaged 28.5 g/tex with a high of 29.6 g/tex for FiberMax 9180B2F and a low of 26.9 g/tex for All-Tex Apex B2RF. All-Tex Apex B2RF had the highest bark incidence with 7 of 8 bales and Deltapine 161B2RF had the lowest with 0 of 8 bales. 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 subsurface drip irrigated production in the Texas High Plains.

Materials and Methods:

Varieties: AFD 5065B2F, All-Tex Apex B2RF, Croplan Genetics 3220B2RF, Deltapine 161B2RF, Dyna-Gro 2570B2RF, FiberMax 9180B2F, NexGen 3348B2RF, PhytoGen 375WRF, Stoneville 4498B2RF

Experimental design: Randomized complete block with 4 replications

Seeding rate: 3.8 seeds/row-ft in 40-inch row spacing (John Deere 1700 and 7300 vacuum planters)

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

Planting date: 14-May

Weed management: Plots were sprayed with Treflan at 1 qt/acre ppi and 2 applications of Roundup Ultra at 1 qt/acre rate with ammonium sulfate on 1-May and 15-June by the producer.

Irrigation: This site was subsurface drip irrigated.

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

April:	0.66"	July:	1.44"
May:	3.19"	August:	1.82"
June:	2.31"	September:	8.35"

Total rainfall: 17.77"

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: Manure compost (2 tons) was applied in March, and 12 gallons/acre 28-0-0 was applied in June via drip fertigation.

Harvest aids: Harvest aids included 22 oz/acre Parazone with NIS applied aerially in October.

Harvest: Plots were harvested on 17 & 18-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. Harvest material from each rep was combined by variety into modules and ginned at Caprock Gin Incorporated.

Gin turnout: Gin turnouts for lint and seed were determined from total lint and seed weights from commercial ginning and net module weights.

Fiber analysis: HVI fiber results were obtained from the USDA-AMS Classing Office in Lubbock and USDA Commodity Credit Corporation (CCC) loan values were determined for each variety by averaging loan values from individually classed bales.

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 (3.8 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/seedindex.html

Results and Discussion:

No significant differences were observed among varieties for plant population on 12-June (Table 1). On 31-July, plant measurements were recorded for 10 plants/plot for a total of 30 plants/variety. Results indicated significant differences in plant height (inches), height to node ratio, node of first position white flower, and nodes above white flower (NAWF).

Plot sizes at this location were of sufficient size to facilitate building variety specific modules. Variety modules were subsequently ginned separately at Caprock Gin Incorporated near Ralls. Remnant bales, if any, were tied off and weights recorded for lint and seed before ginning the next variety. Lint and seed turnouts were calculated based on resulting lint and seed from each module.

Significant differences were observed for all replicated yield and economic parameters measured (Table 2). Lint turnout from commercial ginning (not replicated) ranged from a low of 30.6% to a high of 37.0% for AFD 5065B2F and Dyna-Gro 2570B2RF, respectively. Bur cotton yields averaged 4477 lb/acre with a high of 4699 lb/acre for Stoneville 4498B2RF, to a low of 4283 lb/acre for Deltapine 161B2RF. Lint yields varied with a low of 1353 lb/acre (AFD 5065B2F) and a high of 1688 lb/acre (Dyna-Gro 2570B2RF). Average lint loan values derived from bales ranged from a low of $0.5434/lb (NexGen 3348B2RF) to a high of $0.5708/lb (Deltapine 161B2RF). After adding lint and seed value, total value/acre for varieties ranged from a low of $975.51 for AFD 5065B2F to a high of $1168.98 for Dyna-Gro 2570B2RF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $973.42 (Dyna-Gro 2570B2RF) to a low of $789.47 (AFD 5065B2F), a difference of $183.95.

Lint samples collected from individual bales were submitted to the USDA-AMS classing office in Lubbock for HVI analyses. Values for each fiber quality parameter (except bark) were averaged across bales within each variety specific module (Table 3). Bark is reported as number of bales containing bark over total number of bales from modules. Micronaire values ranged from a low of 3.9 for Deltapine 164B2RF to a high of 4.3 for Dyna-Gro 2570B2RF and NexGen 3348B2RF. Staple length averaged 35.9 across all varieties with a low of 35.0 for PhytoGen 375WRF

and Dyna-Gro 2570B2RF and a high of 37.0 for FiberMax 9180B2F. The highest percent uniformity was observed for NexGen 3348B2RF (81.7%) and AFD 5065B2F had the lowest (80.4%). Strength values averaged 28.5 g/tex with a high of 29.6 g/tex for FiberMax 9180B2F and a low of 26.9 g/tex for All-Tex Apex B2RF. All-Tex Apex B2RF had the highest bark incidence with 7 of 8 bales and Deltapine 161B2RF had the lowest with 0 of 8 bales. Leaf grades ranged from a high of 4.0 for NexGen 3348B2RF to a low of 2.2 for Dyna-Gro 2570B2RF. Color grades of mostly 21s and 31s 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 and Don Crump for detailed ginning at Caprock Gin, Inc. Further assistance with this project was provided by Dr. John Gannaway - Texas AgriLife Research and Extension Center (Retired), 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. Stand count and in season plant map results from the replicated subsurface drip irrigated cotton variety demonstration, David Crump Farm, Ralls, TX, 2008.

Variety	12-Jun		31-Jul						
	Plant stand		Plant height	Total mainstem	Height/node	Node of first	Total fruiting	Node of first	Nodes above first
	#/row ft	#/acre	inches	nodes	ratio	fruiting branch	nodes	position white flower	position white flower
AFD 5065B2F	2.6	33,715	16.3 cd	15.7	1.03 bc	7.07 ab	9.6	8.4 bc	7.3 a
All-Tex Apex B2RF	2.9	37,985	18.7 abc	15.4	1.23 a	6.67 c	9.7	8.1 c	7.3 a
Croplan Genetics 3220B2RF	2.5	33,018	17.7 bc	15.4	1.17 abc	6.93 abc	9.4	8.2 bc	7.1 ab
Deltapine 161B2RF	2.5	33,106	19.9 ab	15.4	1.30 a	7.07 ab	9.4	8.6 ab	6.8 bcd
Dyna-Gro 2570B2RF	3.0	39,988	20.9 a	15.7	1.30 a	7.23 a	9.5	8.8 a	6.9 abc
FiberMax 9180B2F	2.5	33,193	15.0 d	15.5	1.00 c	7.23 a	9.2	9.0 a	6.5 cd
NexGen 3348B2RF	2.7	35,284	18.4 bc	15.4	1.20 ab	6.83 bc	9.5	8.9 a	6.5 d
PhytoGen 375WRF	2.7	35,545	19.2 ab	15.4	1.23 a	6.73 bc	9.7	8.3 bc	7.1 ab
Stoneville 4498B2RF	3.0	38,769	19.0 ab	15.4	1.23 a	7.07 ab	9.3	8.6 ab	6.8 bcd
Test average	2.7	35,622	18.3	15.5	1.19	6.98	9.5	8.6	6.9
CV, %	16.2	16.2	7.7	1.4	8.5	3.5	3.8	2.6	3.5
OSL	0.7521	0.7297	0.0036	0.3160	0.0195	0.0988†	0.7065	0.0015	0.0037
LSD 0.05	NS	NS	2.4	NS	0.18	0.35	NS	0.4	0.4

Means within a column with the same letter are not significantly different.
Plant map 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 subsurface drip irrigated cotton variety demonstration, David Crump Farm, Ralls, TX, 2008.

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 ----------						
Dyna-Gro 2570B2RF	37.0	49.1	4564	1688	2241	0.5596	944.90	224.07	1168.98	136.91	58.66	973.42	a
PhytoGen 375WRF	35.1	47.2	4611	1619	2176	0.5514	892.46	217.65	1110.10	138.34	57.34	914.43	b
Stoneville 4498B2RF	33.7	49.8	4699	1584	2340	0.5471	866.35	234.00	1100.36	140.96	59.00	900.39	b
Croplan Genetics 3220B2RF	34.5	50.2	4430	1529	2224	0.5552	848.61	222.40	1071.01	132.91	58.87	879.23	b
FiberMax 9180B2F	33.0	48.3	4553	1503	2199	0.5642	847.81	219.94	1067.75	136.61	59.52	871.62	bc
Deltapine 161B2RF	32.4	51.0	4283	1388	2184	0.5708	792.09	218.43	1010.53	128.49	57.99	824.05	cd
NexGen 3348B2RF	33.2	49.1	4367	1450	2144	0.5434	787.92	214.44	1002.35	131.02	54.61	816.72	d
All-Tex Apex B2RF	32.9	49.2	4367	1436	2148	0.5450	782.97	214.84	997.82	131.00	53.79	813.02	d
AFD 5065B2F	30.6	52.2	4422	1353	2308	0.5504	744.70	230.81	975.51	132.65	53.39	789.47	d
Test average	33.6	49.6	4477	1505	2218	0.5541	834.20	221.84	1056.04	134.32	57.02	864.71	
CV, %	--	--	3.1	3.0	3.1	--	3.0	3.1	3.0	3.1	--	3.2	
OSL	--	--	0.0313	<0.0001	0.0345	--	<0.0001	0.0339	<0.0001	0.0313	--	<0.0001	
LSD	--	--	237	77	120	--	42.97	12.01	54.87	7.12	--	47.78	

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.

Modules ginned at Caprock Gin Inc. at Ralls.
Assumes:
$3.00/cwt ginning cost.
$200/ton for seed.
Value for lint based on CCC loan value from USDA - AMS classing results.

Table 3. HVI fiber property results from the replicated subsurface drip irrigated cotton variety demonstration, David Crump Farm, Ralls, TX, 2008.

Variety	Micronaire	Staple	Uniformity	Strength	Leaf	Bark	Color grade		Loan
	units	32^{nds} inches	%	g/tex	grade	bales	color 1	color 2	$/lb
AFD 5065B2F	4.0	36.0	80.4	28.4	3.0	5/8	3.0	1.0	0.5504
All-Tex Apex B2RF	4.2	36.0	81.2	26.9	3.3	7/8	2.4	1.0	0.5450
Croplan Genetics 3220B2RF	4.2	36.0	81.1	28.5	2.6	7/9	2.0	1.0	0.5552
Deltapine 161B2RF	3.9	36.0	80.8	28.8	2.9	0/8	2.0	1.0	0.5708
Dyna-Gro 2570B2RF	4.3	35.0	81.0	28.0	2.2	2/10	2.0	1.0	0.5596
FiberMax 9180B2F	4.0	37.0	81.3	29.6	2.9	4/9	2.0	1.0	0.5642
NexGen 3348B2RF	4.3	36.0	81.7	28.9	4.0	2/8	3.0	1.0	0.5434
PhytoGen 375WRF	4.2	35.0	81.1	28.0	3.0	3/9	2.9	1.0	0.5514
Stoneville 4498B2RF	4.1	36.0	81.4	29.0	3.9	2/9	3.0	1.0	0.5471
Test average	4.1	35.9	81.1	28.5	3.1	--	2.5	1.0	0.5541

Numbers in table represent means of all bales in variety module.
Modules ginned at Caprock Gin Inc. at Ralls.
Bales classed by USDA - AMS Classing Office, Lubbock.

AgriLIFE EXTENSION
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Replicated Subsurface Drip Irrigated Cotton Variety Demonstration, Lockney, TX - 2008

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: Significant differences were observed among varieties for plant population on 12-June (Table 1). On 14-August, plant measurements were recorded for 10 plants/plot for a total of 30 plants/variety. Results indicated significant differences in all but total fruiting node numbers. Significant differences were observed for all yield and fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from a low of 26.0% to a high of 31.3% for Deltapine 164B2RF and Dyna-Gro 2570B2RF, respectively. Lint yields varied with a low of 883 lb/acre (Deltapine 164B2RF) and a high of 1563 lb/acre (PhytoGen 375WRF). Average lint loan values ranged from a low of $0.3812/lb (Deltapine 164B2RF) to a high of $0.4855/lb (FiberMax 9180B2F). After subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $739.47 (FiberMax 9180B2F) to a low of $341.30 (Deltapine 164B2RF), a difference of $398.17. Micronaire values ranged from a low of 2.2 for Deltapine 164B2RF to a high of 2.8 for NexGen 3348B2RF and FiberMax 9180B2F. Staple length averaged 35.9 across all varieties with a low of 34.7 for Deltapine 164B2RF and a high of 37.0 for FiberMax 9180B2F. The highest percent uniformity was observed for NexGen 3348B2RF (80.7%) and Deltapine 164B2RF had the lowest (76.0%). Strength values averaged 26.0 g/tex with a high of 28.0 g/tex for FiberMax 9180B2F and Stoneville 4498B2RF, and a low of 24.3 g/tex for Croplan Genetics 4020B2RF and Deltapine 164B2RF. 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: AFD 5065B2F, All-Tex Apex B2RF, Croplan Genetics 3220B2RF, Croplan Genetics 4020B2RF, Deltapine 164B2RF, Dyna-Gro 2570B2RF, FiberMax 9180B2F, NexGen 3348B2RF, PhytoGen 375WRF, Stoneville 4498B2RF

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: 14-May

Weed management: Plots were sprayed with 1.5 pts/acre Dual and 1.0 qt/acre Direx pre-emerge. During the growing season the producer made 3 applications of Roundup Ultra at 24.0 oz/acre with ammonium sulfate.

Irrigation and rainfall: According to personal correspondence with the producer, approximately 8.0 inches of rainfall accumulated during the growing season in addition to 12.0 inches of irrigation for a total on 20.0 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 by producer pre-plant. 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: At pinhead square, 4.0 oz/acre of Pix 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 on 16-October.

Harvest: Plots were harvested on 18 & 19-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/seedindex.html

Results and Discussion:

Significant differences were observed among varieties for plant population on 12-June (Table 1). On 14-August, plant measurements were recorded for 10 plants/plot for a total of 30 plants/variety. Results indicated significant differences in all but total fruiting node numbers. Plant population averaged 25,439 plants/acre across all varieties with a high of 32,583 for AFD 5065B2F and a low of 17,685 for Deltapine 164B2RF. Plant height ranged from a high of 29.4 inches for PhytoGen 375WRF to a low of 22.9 for Croplan Genetics 4020B2RF. The test average total mainstem nodes was 18.6 and resulted in an average height to node ratio of 1.39. Croplan Genetics 3220B2RF and Dyna-Gro 2570B2RF had the highest average node of first fruiting branch at 8.2 and Croplan Genetics 4020B2RF had the lowest of 6.8. Total fruiting nodes averaged 12.1 across all varieties with a range of from 11.5 for Croplan Genetics 4020B2RF to 12.4 for FiberMax 9180B2F.

Significant differences were observed for all yield and fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from a low of 26.0% to a high of 31.3% for Deltapine 164B2RF and Dyna-Gro 2570B2RF, respectively. Bur cotton yields averaged 4485 lb/acre with a high of 5188 lb/acre for NexGen 3348B2RF, to a low of 3403 lb/acre for Deltapine 164B2RF. Lint yields varied with a low of 883 lb/acre (Deltapine 164B2RF) and a high of 1563 lb/acre (PhytoGen 375WRF). Average lint loan values ranged from a low of $0.3812/lb (Deltapine 164B2RF) to a high of $0.4855/lb (FiberMax 9180B2F). After adding lint and seed value, total value/acre for varieties ranged from a low of $504.91 for Deltapine 164B2RF to a high of $947.27 for NexGen 3348B2RF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $739.47 (FiberMax 9180B2F) to a low of $341.30 (Deltapine 164B2RF), a difference of $398.17.

Micronaire values ranged from a low of 2.2 for Deltapine 164B2RF to a high of 2.8 for NexGen 3348B2RF and FiberMax 9180B2F. Staple length averaged 35.9 across all varieties with a low of 34.7 for Deltapine 164B2RF and a high of 37.0 for FiberMax 9180B2F. The highest percent uniformity was observed for NexGen 3348B2RF (80.7%) and Deltapine 164B2RF had the lowest (76.0%). Strength

values averaged 26.0 g/tex with a high of 28.0 g/tex for FiberMax 9180B2F and Stoneville 4498B2RF, and a low of 24.3 g/tex for Croplan Genetics 4020B2RF and Deltapine 164B2RF. Elongation ranged from a high of 10.8% for Stoneville 4498B2RF to a low of 8.7% for Deltapine 164B2RF. Leaf grades were mostly 2s and 3s at this location. Values for reflectance (Rd) and yellowness (+b) averaged 76.5 and 10.7, respectively. Color grades varied greatly with mostly 12s and 22s 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 Boyd Jackson for the use of his land, equipment and labor for this project. Further assistance with this project was provided by Dr. John Gannaway - Texas AgriLife Research and Extension Center (Retired), 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. Stand count and in season plant map results from the replicated subsurface drip irrigated cotton variety demonstration, Boyd Jackson Farm, Lockney, TX, 2008.

Variety	12-Jun		14-Aug						
	Plant stand		Plant height	Total mainstem	Height/node	Node of first	Total fruiting	Node of first	Nodes above first
	#/row ft	#/acre	inches	nodes	ratio	fruiting branch	nodes	position white flower	position white flower
AFD 5065B2F	2.5	32,583 a	25.5 c	18.2 c	1.40 bcd	7.2 bcd	12.0	14.0 bc	4.3 c
All-Tex Apex B2RF	2.2	28,140 ab	24.8 cd	18.4 bc	1.35 cd	7.4 bc	11.9	14.0 bc	4.4 c
Croplan Genetics 3220B2RF	2.1	27,704 ab	27.4 b	19.5 a	1.41 bc	8.2 a	12.3	15.0 a	4.4 bc
Croplan Genetics 4020B2RF	1.5	19,602 cd	22.9 e	17.3 d	1.32 d	6.8 d	11.5	13.1 e	4.2 cd
Deltapine 164B2RF	1.3	17,685 d	26.9 b	18.6 bc	1.45 b	7.4 bc	12.2	14.0 bc	4.6 abc
Dyna-Gro 2570B2RF	2.2	28,924 ab	26.9 b	19.5 a	1.38 bcd	8.2 a	12.3	14.4 b	5.1 a
FiberMax 9180B2F	1.7	22,216 bcd	23.1 e	19.1 ab	1.21 e	7.6 b	12.4	15.4 a	3.7 d
NexGen 3348B2RF	1.9	24,394 bcd	27.7 b	18.1 c	1.53 a	7.2 bc	11.9	13.8 cd	4.3 c
PhytoGen 375WRF	2.0	27,007 abc	29.4 a	18.6 bc	1.58 a	7.5 b	12.1	14.1 bc	4.5 abc
Stoneville 4498B2RF	2.0	26,136 abc	24.4 d	18.3 c	1.33 d	7.0 cd	12.3	13.3 de	5.0 ab
Test average	1.9	25,439	25.9	18.6	1.39	7.5	12.1	14.1	4.4
CV, %	17.9	17.7	2.4	2.2	3.3	3.4	3.5	2.2	7.5
OSL	0.0244	0.0216	<0.0001	0.0002	<0.0001	<0.0001	0.3606	<0.0001	0.0042
LSD 0.05	0.6	7,718	1.1	0.7	0.08	0.4	NS	0.5	0.6

Means within a column with the same letter are not significantly different at the 0.05 probability level.
Plant map 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 subsurface drip irrigated cotton variety demonstration, Boyd Jackson Farm, Lockney, TX, 2008.

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 9180B2F	31.0	50.1	4685	1454	2347	0.4855	708.51	234.67	943.18	140.55	63.15	739.47	a
NexGen 3348B2RF	28.9	49.1	5188	1501	2548	0.4608	692.47	254.80	947.27	155.65	57.95	733.68	a
PhytoGen 375WRF	31.2	47.3	5001	1563	2364	0.4405	687.50	236.44	923.94	150.02	60.84	713.07	ab
AFD 5065B2F	26.5	51.8	4981	1322	2582	0.4775	632.36	258.22	890.58	149.43	56.65	684.49	abc
Dyna-Gro 2570B2RF	31.3	51.3	4307	1347	2211	0.4192	565.85	221.08	786.94	129.22	62.24	595.48	abc
Croplan Genetics 3220B2RF	29.1	50.8	4377	1272	2221	0.4260	543.84	222.16	766.00	131.31	62.47	572.22	bc
Stoneville 4498B2RF	30.0	46.6	4510	1351	2103	0.4087	552.27	210.28	762.54	135.30	62.60	564.64	bc
All-Tex Apex B2RF	28.2	49.2	4323	1221	2129	0.4305	526.96	212.86	739.82	129.70	57.08	553.04	c
Croplan Genetics 4020B2RF	29.0	49.6	4078	1182	2022	0.4500	532.95	202.23	735.18	122.34	62.47	550.37	c
Deltapine 164B2RF	26.0	49.5	3403	883	1684	0.3812	336.51	168.40	504.91	102.07	61.54	341.30	d
Test average	29.1	49.5	4485	1310	2221	0.4380	577.92	222.11	800.04	134.56	60.70	604.78	
CV, %	3.6	4.0	9.2	9.1	9.2	5.6	13.7	9.2	12.3	9.2	--	14.3	
OSL	<0.0001	0.0962†	0.0022	0.0001	0.0018	0.0017	0.0007	0.0018	0.0009	0.0022	--	0.0008	
LSD	1.8	2.8	706	205	349	0.0420	135.53	34.88	168.72	21.17	--	148.55	

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.
$200/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 subsurface drip irrigated cotton variety demonstration, Boyd Jackson Farm, Lockney, TX, 2008.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
AFD 5065B2F	2.7	36.9	80.4	27.3	10.2	1.7	78.3	9.7	1.7	1.7
All-Tex Apex B2RF	2.4	36.3	78.1	24.7	9.8	2.3	77.9	10.5	1.0	2.0
Croplan Genetics 3220B2RF	2.3	35.5	78.0	25.5	10.1	1.0	76.8	11.0	1.0	2.3
Croplan Genetics 4020B2RF	2.5	36.0	78.0	24.3	9.7	2.3	78.2	10.2	1.3	1.3
Deltapine 164B2RF	2.2	34.7	76.0	24.3	8.7	2.7	73.9	11.8	1.7	3.0
Dyna-Gro 2570B2RF	2.4	35.7	78.6	25.9	10.4	1.0	76.0	11.5	1.0	2.7
FiberMax 9180B2F	2.8	37.0	79.7	28.0	9.3	1.7	78.3	9.7	2.0	1.3
NexGen 3348B2RF	2.8	36.5	80.7	27.2	10.2	3.0	74.6	10.7	2.3	2.0
PhytoGen 375WRF	2.6	35.0	79.0	25.0	9.7	1.7	76.6	10.5	1.7	2.0
Stoneville 4498B2RF	2.5	35.9	79.2	28.0	10.8	3.0	74.5	11.7	1.7	3.0
Test average	2.5	35.9	78.8	26.0	9.9	2.0	76.5	10.7	1.5	2.1
CV, %	6.4	2.0	1.5	3.8	4.2	44.2	1.4	3.9	--	--
OSL	0.0014	0.0132	0.0039	0.0003	0.0007	0.0918†	0.0002	<0.0001	--	--
LSD	0.3	1.2	2.0	1.7	0.7	1.3	1.9	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 LEPA Irrigated Cotton Variety Demonstration, AG-CARES, Lamesa, TX - 2008

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: No significant differences were observed among varieties for plant population counts taken on 11-June, however, significant differences were observed for all plant measurements conducted on 13-August (Table 1). Significant differences were noted for lint and seed turnout but not for the remaining yield and economic parameters due to field variability (Table 2). Lint turnout ranged from 31.6% for Deltapine 164B2RF to 36.7% for FiberMax 1740B2F. Lint yields varied from a low of 1045 lb/acre (NexGen 3348B2RF) to a high of 1336 lb/acre (Dyna-Gro 2570B2RF). Lint loan values ranged from a low of $0.5140/lb to a high of $0.5537/lb for NexGen 3348B2RF and Deltapine 164B2RF, respectively. After subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $742.74 (Dyna-Gro 2570B2RF) to a low of $550.51 (NexGen 3348B2RF), a difference of $192.23. However, this difference was not significant. No significant differences were observed for micronaire, uniformity, or leaf grade at this location (Table 3). Micronaire values ranged from a low of 4.3 for Deltapine 164B2RF to a high of 4.7 for Dyna-Gro 2570B2RF and PhytoGen 375WRF. Staple length averaged 34.9 across all varieties with a low of 34.2 (FiberMax 1740B2F and PhytoGen 375WRF) and a high of 36.7 (Deltapine 164B2RF). Percent uniformity ranged from a low of 78.8% (AFD 5065B2F and All-Tex Apex B2RF) to a high of 80.2% (NexGen 3348B2RF) and strength ranged from a low of 26.3 g/tex for All-Tex Apex B2RF to a high of 28.4 g/tex for Deltapine 164B2RF.

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:	AFD 5065B2F, All-Tex Apex B2RF, Croplan Genetics 3220B2RF, Dyna-Gro 2570B2RF, Deltapine 164B2RF, FiberMax 1740B2F, NexGen 3348B2RF, PhytoGen 375WRF, and Stoneville 5458B2RF
Experimental design:	Randomized complete block with 3 replications
Seeding rate:	3.6 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 (568-872 ft long)
Planting date:	8-May
Fertilization:	120 lbs/acre 32-0-0 were applied via fertigation at this location
Weed management:	Trifluralin was applied preplant incorporated at 1.3 pt/acre on 15-April. Roundup Power Max was applied over-the-top at 30 oz/acre on 12-June, and at 26 oz/acre on 20-August with Level 7 (AMS) at 3.2 oz/acre (both application timings). Plots were cultivated and dikes installed on 27-May and an additional cultivation was performed on 11-June. Three sand fighting events took place on 29-June, 17-June and 20-June. On 17-August, plots were spot sprayed with a 1% Roundup Power Max solution.
Irrigation	9.6" inches of irrigation were applied via LEPA center pivot during the growing season.

Rainfall:

April:	2.11"	August:	0.39"
May:	2.85"	September:	5.25"
June:	1.05"	October:	2.41"
July:	0.13"		

Total rainfall: 14.19"

Total irrigation and rainfall: 23.79"

Insecticides:	Temik was applied infurrow at planting at 3.5 lb/acre. 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 22 oz/acre Prep with 6 oz/acre Ginstar applied on 2-October. A sequential application of 32 oz/acre Gramoxone Inteon with 0.25% v/v NIS was made on 16-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 $200/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/seedindex.html

Results and Discussion:

No significant differences were observed among varieties for plant population counts taken on 11-June, however, significant differences were observed for all plant measurements conducted on 13-August (Table 1). Plant population averaged 51,794 across all varieties and ranged from a high of 55,640 to a low of 46,580 for AFD 5065B2F and Deltapine 164B2RF, respectively. Plant measurements reported represent an average from 10 plants per plot or 30 plants per variety. Plant height ranged from a high of 21.0" for Dyna-Gro 2570B2RF to a low of 14.7" for Stoneville 5458B2RF. Total mainstem node numbers averaged 17.7 across all varieties resulting in a test average height to node ratio of 1.05. The lowest node of first fruiting branch was observed for AFD 5065B2F at 6.6 and the highest for NexGen 3348B2RF and Deltapine 164B2RF of 7.8. Total number of fruiting nodes was greatest for PhytoGen 375WRF (13.1) and lowest for Croplan Genetics 3220B2RF (10.0).

Significant differences were noted for lint and seed turnout but not for the remaining yield and economic parameters due to field variability (Table 2). Lint turnout ranged from 31.6% for Deltapine 164B2RF to 36.7% for FiberMax 1740B2F. Bur cotton yields averaged 3489 lb/acre with a high of 3771 lb/acre for Dyna-Gro 2570B2RF and a low of 3080 lb/acre for NexGen 3348B2RF. Lint yields varied from a low of 1045 lb/acre (NexGen 3348B2RF) to a high of 1336 lb/acre (Dyna-Gro 2570B2RF). Lint loan values ranged from a low of $0.5140/lb to a high of $0.5537/lb for NexGen 3348B2RF and Deltapine 164B2RF, respectively. After adding lint and seed value, total value/acre ranged from a low of $695.70 for NexGen 3348B2RF, to a high of $912.58 for Dyna-Gro 2570B2RF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $742.74 (Dyna-Gro 2570B2RF) to a low of $550.51 (NexGen 3348B2RF), a difference of $192.23. However, this difference was not significant.

No significant differences were observed for micronaire, uniformity, or leaf grade at this location (Table 3). Micronaire values ranged from a low of 4.3 for Deltapine 164B2RF to a high of 4.7 for Dyna-Gro 2570B2RF and PhytoGen 375WRF. Staple length averaged 34.9 across all varieties with a low of 34.2 (FiberMax 1740B2F) and a high of 36.7 (Deltapine 164B2RF). Percent uniformity ranged from a low of 78.8% (AFD 5065B2F) to a high of 80.2% (NexGen 3348B2RF) and strength ranged from a low of 26.3 g/tex for All-Tex Apex B2RF to a high of 28.4 g/tex for Deltapine 164B2RF. Percent elongation was highest for Dyna-Gro 2570B2RF (10.9%) and lowest for Deltapine 164B2RF and Stoneville 5458B2RF (9.5%) with a test average of 10.1%. Leaf grades were mostly 3s, with some 2s and 4s. Test averages for Rd (reflectance) and +b (yellowness) were 77.2 and 8.2, respectively. This resulted in color grades of mostly 31s.

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 Danny Carmichael for his cooperation and assistance with this demonstration. Further assistance with this project was provided by Dr. John Gannaway - Texas AgriLife Research and Extension Center (Retired), 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. Stand count and in season plant map results from the replicated LEPA irrigated cotton variety demonstration, AGCARES Farm, Lamesa, TX, 2008.

Variety	11-Jun		13-Aug						
	Plant stand		Plant height	Total mainstem	Height/node	Node of first	Total fruiting	Node of first	Nodes above first
	#/row ft	#/acre	inches	nodes	ratio	fruiting branch	nodes	position white flower	position white flower
AFD 5065B2F	3.2	55,640	17.4 d	17.7 b	0.98 d	6.6 d	12.1 b	12.5 d	5.2 a
All-Tex Apex B2RF	3.0	52,736	17.5 d	16.5 d	1.06 bc	7.1 cd	10.4 de	11.9 e	4.6 ab
Croplan Genetics 3220B2RF	2.8	49,136	18.2 d	16.6 cd	1.09 bc	7.6 ab	10.0 e	12.7 d	3.9 bc
Deltapine 164B2RF	2.7	46,580	19.0 c	19.3 a	0.98 d	7.8 a	12.5 ab	15.7 a	3.6 c
Dyna-Gro 2570B2RF	2.8	48,207	21.0 a	17.3 bc	1.21 a	7.3 bc	11.1 cd	13.4 c	4.0 bc
FiberMax 1740B2F	3.1	55,060	19.0 c	17.7 b	1.07 bc	7.0 cd	11.7 bc	13.9 bc	3.8 c
NexGen 3348B2RF	3.1	54,944	20.3 ab	17.7 b	1.15 ab	7.8 a	10.9 cde	14.3 b	3.4 c
PhytoGen 375WRF	3.2	55,292	20.1 b	19.3 a	1.04 bd	7.2 bc	13.1 a	15.6 a	3.7 c
Stoneville 5458B2RF	2.8	48,555	14.7 e	17.0 bcd	0.86 e	7.5 abc	10.5 de	13.7 bc	3.3 c
Test average	3.0	51,794	18.6	17.7	1.05	7.3	11.4	13.7	3.9
CV, %	11.6	11.6	2.5	2.6	3.9	3.9	5.0	2.8	10.0
OSL	0.4482	0.4102	<0.0001	<0.0001	<0.0001	0.0012	<0.0001	<0.0001	0.0006
LSD 0.05	NS	NS	0.8	0.8	0.07	0.5	1.0	0.7	0.7

Means within a column with the same letter are not significantly different at the 0.05 probability level.
Plant map 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 LEPA irrigated cotton variety demonstration, AGCARES Farm, Lamesa, TX, 2008.

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 ----------					
Dyna-Gro 2570B2RF	35.4	51.3	3771	1336	1934	0.5367	719.22	193.35	912.58	113.13	56.70	742.74
FiberMax 1740B2F	36.7	49.1	3580	1314	1758	0.5422	712.41	175.79	888.20	107.41	57.53	723.26
All-Tex Apex B2RF	33.3	51.2	3621	1204	1855	0.5492	661.36	185.49	846.85	108.64	52.00	686.22
Croplan Genetics 3220B2RF	35.2	51.9	3384	1192	1758	0.5442	651.14	175.76	826.90	101.53	56.91	668.46
Deltapine 164B2RF	31.6	49.8	3674	1162	1828	0.5537	643.40	182.85	826.25	110.22	56.06	659.97
PhytoGen 375WRF	35.5	47.2	3407	1211	1610	0.5415	654.82	160.97	815.79	102.22	55.43	658.14
Stoneville 5458B2RF	33.1	48.9	3631	1202	1776	0.5267	631.63	177.65	809.28	108.94	57.03	643.31
AFD 5065B2F	32.2	54.3	3255	1049	1768	0.5222	548.00	176.76	724.76	97.65	51.61	575.50
NexGen 3348B2RF	33.9	50.8	3080	1045	1565	0.5140	539.18	156.52	695.70	92.41	52.79	550.51
Test average	34.1	50.5	3489	1191	1761	0.5367	640.13	176.13	816.26	104.68	55.12	656.46
CV, %	1.5	2.6	10.8	10.7	10.6	3.8	12.3	10.6	11.8	10.8	--	13.0
OSL	<0.0001	0.0004	0.4392	0.1436	0.3956	0.3489	0.1336	0.3950	0.2146	0.4398	--	0.2068
LSD	0.9	2.3	NS	NS	NS	NS	NS	NS	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, NS - not significant.
Note: some columns may not add up due to rounding error.

Assumes:
$3.00/cwt ginning cost.
$200/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 cotton variety demonstration, AGCARES Farm, Lamesa, TX, 2008.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
AFD 5065B2F	4.6	34.5	78.8	26.8	10.7	3.7	77.5	7.5	3.7	1.0
All-Tex Apex B2RF	4.4	35.3	78.8	26.3	9.9	3.0	78.1	7.9	3.0	1.0
Croplan Genetics 3220B2RF	4.5	35.2	79.8	27.0	10.5	3.0	77.7	8.2	3.0	1.0
Dyna-Gro 2570B2RF	4.7	34.7	79.9	26.4	10.9	2.3	77.2	8.8	3.0	1.3
Deltapine 164B2RF	4.3	36.7	79.7	28.4	9.5	3.0	79.0	7.6	3.0	1.0
FiberMax 1740B2F	4.6	34.2	79.8	27.3	10.0	2.3	77.8	8.6	3.0	1.0
NexGen 3348B2RF	4.5	34.3	80.2	27.6	9.6	4.3	75.2	8.2	4.0	1.0
PhytoGen 375WRF	4.7	34.2	79.8	26.9	10.2	2.7	77.2	8.2	3.0	1.0
Stoneville 5458B2RF	4.6	35.2	79.4	28.0	9.5	4.0	75.2	8.6	3.3	1.0
Test average	4.5	34.9	79.6	27.2	10.1	3.1	77.2	8.2	3.2	1.0
CV, %	3.6	2.7	1.2	2.1	5.3	37.9	1.5	5.1	--	--
OSL	0.1338	0.0934†	0.5776	0.0050	0.0364	0.4365	0.0189	0.0152	--	--
LSD	NS	1.3	NS	1.0	0.9	NS	2.1	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
Texas A&M System

Replicated Irrigated Cotton Variety Demonstration, Halfway, TX - 2008

Cooperator: Texas AgriLife Research Center - Halfway

Greg Cronholm, Randy Boman, Mark Kelley and Chris Ashbrook
EA-IPM Hale County, Extension Agronomist - Cotton, Extension Program Specialist II - Cotton, and Extension Assistant - Cotton

Hale County

Summary: Significant differences were noted for all plant population and plant measurements taken (Table 1) and for several yield and fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from 31.5% for AFD 5065B2F, to 36.8% for Dyna-Gro 2570B2RF. Lint yields varied from 1025 lb/acre to 1301 lb/acre for AFD 5065B2F and PhytoGen 375WRF, respectively with a test average of 1159 lb/acre. Lint loan values ranged from a low of $0.4867/lb for Stoneville 4498B2RF, to a high of $0.5280/lb for All-Tex Apex B2RF. After subtracting ginning, seed and technology fee costs, net value ranged from a high of $650.47 for PhytoGen 375WRF to a low of $518.51 for AFD 5065B2F, a difference of $131.96. However, net value differences were not significant. Micronaire ranged from a low of 3.0 for AFD 5065B2F, Deltapine 104B2RF, FiberMax 9180B2F, and Stoneville 4498B2RF, to a high of 3.3 for NexGen 3348B2RF. Staple length averaged 35.3 across all varieties with a low of 34.6 (AFD 5065B2F) and a high of 36.2 (All-Tex Apex B2RF). Percent uniformity ranged from a low of 79.1% (NexGen 3348B2RF) to a high of 81.1% (Stoneville 4498B2RF). A test average strength of 26.7 g/tex was observed and Croplan Genetics 3520B2RF produced the lowest value (25.4 g/tex), and FiberMax 9180B2F produced the highest (28.2 g/tex).

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: AFD 5065B2F, All-Tex Apex B2RF, Croplan Genetics 3520B2RF, Deltapine 104B2RF, Dyna-Gro 2570B2RF, FiberMax 9180B2F, NexGen 3348B2RF, PhytoGen 375WRF, Stoneville 4498B2RF

Experimental design: Randomized complete block with 3 replications

Seeding rate: 4.6 seeds/row-ft in 40-inch row spacing (John Deere 1700 Max Emerge vacuum planter)

Plot size: 4 rows by variable length of field (865-1312 ft long)

Planting date: 13-May

Weed management: Trifluralin was applied pre-plant incorporated on 31-March. For control of volunteer corn, two applications of 6.0 oz/acre Fusion were applied on 30-May and 8-July. Also, two applications of 22.0 oz/acre Roundup Weather Max with AMS were conducted on 3-June and 8-August.

Irrigation and rainfall: A total of 10.04 inches of irrigation were applied at this location. Pre-plant irrigation totaled 2.0 inches and 8.04 inches were applied during the growing season. In addition to irrigation, this location received 10.34 inches of rainfall for a total of 20.38 inches of moisture.

Insecticides: Temik was applied infurrow at planting at a rate of 4.0 lb/acre. 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 3-July, 100 lb/acre N were applied via coulter rig using 32-0-0.

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

Harvest: Plots were harvested on 19-December 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 $200/ton. Ginning costs did not include checkoff.

Seed and technology fees: Seed and technology costs were calculated using the appropriate seeding rate (4.6 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/seedindex.html

Results and Discussion:

Significant differences were observed for plant population counts on 10-June and plant measurements taken on 8-August (Table 1). The test average plant population (plants/acre) was 50,981 with a range of from 39,262 for Croplan Genetics 3520B2RF to 61,332 for Stoneville 4498B2RF. Plant height (inches) ranged from a high of 25.3" for Dyna-Gro 2570B2RF, to a low of 20.8" for Deltapine 104B2RF. Test average total number of mainstem nodes was 17.1 and resulted in an average height to node ratio of 1.32. Deltapine 104B2RF had the lowest node of first fruiting branch (6.4) and FiberMax 9180B2F had the highest (8.0). Total number of fruiting branches averaged 16.2 across all varieties and ranged from a high of 18.6 for Dyna-Gro 2570B2RF to a low of 14.0 for FiberMax 9180B2F.

Significant differences were observed for some yield and HVI fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from 31.5%, for AFD 5065B2F, to 36.8% for Dyna-Gro 2570B2RF. Bur cotton yields averaged 3402 lb/acre with a high of 3749 lb/acre for Deltapine 104B2RF, to a low of 3196 lb/acre for NexGen 3348B2RF. Lint yields varied from 1025 lb/acre to 1301 lb/acre for AFD 5065B2F and PhytoGen 375WRF, respectively with a test average of 1159 lb/acre. Lint loan values ranged from a low of $0.4867/lb for Stoneville 4498B2RF, to a high of $0.5280/lb for All-Tex Apex B2RF. After adding lint and seed value, total value/acre for varieties ranged from a low of $681.61 for AFD 5065B2F to a high of $830.26 for PhytoGen 375WRF. When subtracting ginning, seed and technology fee costs, net value/acre ranged from a high of $650.47 for PhytoGen 375WRF to a low of $518.51 for AFD 5065B2F, a difference of $131.96. However, net value differences were not significant.

Micronaire ranged from a low of 3.0 for AFD 5065B2F, Deltapine 104B2RF, FiberMax 9180B2F, and Stoneville 4498B2RF, to a high of 3.3 for NexGen 3348B2RF. Staple length averaged 35.3 across all varieties with a low of 34.6 (AFD 5065B2F) and a high of 36.2 (All-Tex Apex B2RF). Percent uniformity ranged from a low of 79.1% for NexGen 3348B2RF, to a high of 81.1% for Stoneville 4498B2RF. A test average strength of 26.7 g/tex was observed and Croplan Genetics 3520B2RF produced the lowest value (25.4 g/tex) and FiberMax 9180B2F produced the highest (28.2 g/tex). Elongation ranged from a high of 11.3% for Stoneville 4498B2RF to a low of 9.5% for FiberMax 9180B2F. Leaf grades were mostly 2s and 3s at this location. Values for reflectance (Rd) and yellowness (+b) averaged 77.0 and 9.3, respectively. This resulted in color grades of mostly 21s and 31s across varieties.

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. John Gannaway - Texas AgriLife Research and Extension Center (Retired), 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. Stand count and in season plant map results from the replicated irrigated cotton variety demonstration, Texas AgriLife Research Center, Halfway, TX, 2008.

Variety	10-Jun		8-Aug						
	Plant stand		Plant height	Total mainstem	Height/node	Node of first	Total fruiting	Node of first	Nodes above first
	#/row ft	#/acre	inches	nodes	ratio	fruiting branch	nodes	position white flower	position white flower
AFD 5065B2F	2.5	43,908 cde	22.5 bc	17.0 bc	1.31 abc	7.1 bc	16.3 abcd	12.4 ab	4.6 bcd
All-Tex Apex B2RF	3.0	52,388 abcd	23.8 ab	16.8 c	1.41 a	7.2 bc	17.5 ab	11.5 c	5.3 ab
Croplan Genetics 3520B2RF	2.3	39,262 e	22.7 bc	17.0 c	1.33 ab	6.8 cd	16.9 abc	12.1 bc	4.9 abcd
Deltapine 104B2RF	3.1	54,827 abc	20.8 c	17.1 bc	1.22 cd	6.4 d	15.4 bcd	13.0 a	4.1 d
Dyna-Gro 2570B2RF	2.8	48,323 bcde	25.3 a	18.0 a	1.41 a	7.8 ab	18.6 a	12.5 ab	5.5 a
FiberMax 9180B2F	2.4	42,166 de	21.0 c	17.8 ab	1.18 d	8.0 a	14.0 d	12.8 ab	5.0 abc
NexGen 3348B2RF	3.3	56,918 ab	21.2 c	16.7 cd	1.26 bcd	7.1 bcd	15.1 bcd	12.5 ab	4.2 d
PhytoGen 375WRF	3.4	59,706 ab	24.2 ab	17.2 abc	1.40 a	7.5 ab	17.7 ab	12.1 bc	5.1 abc
Stoneville 4498B2RF	3.5	61,332 a	21.1 c	15.9 d	1.32 ab	7.4 abc	14.6 cd	11.6 c	4.4 cd
Test average	2.9	50,981	22.5	17.1	1.32	7.3	16.2	12.3	4.8
CV, %	12.8	13.0	6.4	2.7	5.1	5.6	9.7	3.6	9.4
OSL	0.0054	0.0063	0.0103	0.0027	0.0035	0.0048	0.0320	0.0090	0.0142
LSD 0.05	0.6	11,500	2.5	0.8	0.12	0.7	2.7	0.8	0.8

Means within a column with the same letter are not significantly different at the 0.05 probability level.
Plant map 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.

Table 2. Harvest results from the replicated irrigated cotton variety demonstration, Texas AgriLife Research Center, Halfway, TX, 2008.

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 ----------					
PhytoGen 375WRF	35.6	49.8	3653	1301	1819	0.4983	648.29	181.97	830.26	109.59	70.20	650.47
Dyna-Gro 2570B2RF	36.8	52.4	3428	1260	1795	0.4933	621.99	179.46	801.45	102.84	71.82	626.79
Deltapine 104B2RF	32.1	54.6	3749	1204	2049	0.5000	602.88	204.91	807.78	112.47	71.00	624.31
Stoneville 4498B2RF	35.1	50.8	3471	1217	1763	0.4867	593.42	176.36	769.78	104.11	72.23	593.43
All-Tex Apex B2RF	33.9	53.1	3231	1095	1715	0.5280	578.47	171.46	749.92	96.94	65.86	587.12
FiberMax 9180B2F	33.8	51.6	3423	1156	1765	0.5062	585.02	176.47	761.48	102.70	72.87	585.92
NexGen 3348B2RF	34.2	51.7	3196	1091	1653	0.5125	559.26	165.29	724.55	95.87	66.86	561.82
Croplan Genetics 3520B2RF	33.8	53.3	3206	1085	1708	0.5070	550.51	170.78	721.28	96.18	72.08	553.02
AFD 5065B2F	31.5	54.9	3258	1025	1788	0.4912	502.79	178.82	681.61	97.73	65.37	518.51
Test average	34.1	52.5	3402	1159	1784	0.5026	582.51	178.39	760.90	102.05	69.81	589.04
CV, %	4.8	2.8	6.5	6.6	6.5	4.9	10.1	6.5	9.1	6.5	--	10.7
OSL	0.0279	0.0083	0.0599†	0.0059	0.0387	0.6220	0.2120	0.0388	0.2653	0.0600†	--	0.3253
LSD	2.8	2.5	315	132	201	NS	NS	20.13	NS	9.46	--	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, †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.
$200/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 cotton variety demonstration, Texas AgriLife Research Center, Halfway, TX, 2008.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
AFD 5065B2F	3.0	34.6	79.3	26.9	10.4	2.3	77.5	8.9	2.7	1.0
All-Tex Apex B2RF	3.1	36.2	80.2	25.6	10.1	1.7	77.5	9.4	2.7	1.0
Croplan Genetics 3520B2RF	3.1	35.4	80.2	25.4	10.9	3.0	77.1	9.1	2.7	1.0
Deltapine 104B2RF	3.0	34.9	80.3	27.5	11.0	2.7	77.1	8.7	3.0	1.0
Dyna-Gro 2570B2RF	3.1	35.3	79.2	26.0	11.0	1.0	77.2	9.7	2.0	1.7
FiberMax 9180B2F	3.0	35.7	79.5	28.2	9.5	2.0	77.9	9.1	2.3	1.0
NexGen 3348B2RF	3.3	34.8	79.1	27.2	10.4	3.0	76.7	9.4	2.7	1.0
PhytoGen 375WRF	3.2	35.4	80.3	25.9	9.8	1.7	76.2	9.7	2.3	1.7
Stoneville 4498B2RF	3.0	35.3	81.1	27.5	11.3	2.3	75.5	10.1	2.3	2.0
Test average	3.1	35.3	79.9	26.7	10.5	2.2	77.0	9.3	2.5	1.3
CV, %	3.8	2.1	1.3	1.8	2.7	25.1	0.8	3.9	--	--
OSL	0.0271	0.2663	0.3412	<0.0001	<0.0001	0.0053	0.0099	0.0038	--	--
LSD	0.2	NS	NS	0.8	0.5	0.9	1.1	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.

AgriLIFE EXTENSION
Texas A&M System

Replicated Irrigated Cotton Variety Demonstration, Silverton, TX - 2008

Cooperator: Wayne Reed

Nathan Carr, Randy Boman, Mark Kelley and Chris Ashbrook
CEA-ANR Briscoe County, Extension Agronomist - Cotton, Extension Program Specialist II - Cotton, and Extension Assistant - Cotton

Briscoe County

Summary: No significant differences were observed among varieties for plant population on 12-June (Table 1). On 31-July, significant differences were observed for some plant measurements recorded. Significant differences were observed for most yield and HVI lint quality parameters measured (Tables 2 and 3). Lint turnout ranged from a low of 30.8% to 35.8% for AFD 5065B2F and PhytoGen 375WRF, respectively. Lint yields varied with a low of 990 lb/acre (AFD 5065B2F) and a high of 1222 lb/acre (PhytoGen 375WRF). Lint loan values ranged from a low of $0.5153/lb (Stoneville 4498B2RF) to a high of $0.5677/lb (FiberMax 9180B2F). When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $668.48 (PhytoGen 375WRF) to a low of $559.86 (AFD 5065B2F), a difference of $108.62. Micronaire values ranged from a low of 3.4 for All-Tex Apex B2RF and Stoneville 4498B2RF to a high of 4.0 for NexGen 3348B2RF. Staple length averaged 35.1 across all varieties with a low of 34.1 for PhytoGen 375WRF and Stoneville 4498B2RF and a high of 35.9 for FiberMax 9180B2F. The highest percent uniformity was observed for NexGen 3348B2RF (80.7%) and Deltapine 164B2RF had the lowest (78.1%), however, these differences were not significant. Strength values averaged 27.0 g/tex with a high of 28.0 g/tex for FiberMax 9180B2F and Stoneville 4498B2RF, and a low of 25.8 g/tex for Deltapine 164B2RF. 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: AFD 5065B2F, All-Tex Apex B2RF, Croplan Genetics 3220B2RF, Deltapine 164B2RF, FiberMax 9180B2F, NexGen 3348B2RF, PhytoGen 375WRF, Stoneville 4498B2RF

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3.8 seeds/row-ft in 40-inch row spacing (John Deere 7300 vacuum planter)

Plot size: 4 rows by variable length of field (2534-2542 ft long)

Planting date: 20-May

Weed management: Treflan was applied pre-plant incorporated at 1.0 qt/acre. Two applications of Roundup Ultra Max were applied voer-the-top at 1.0 qt/acre with ammonium sulfate during the growing season.

Irrigation: This location was under a LESA center pivot following sorghum, however, total irrigation amounts were not readily available.

Rainfall: Based on recorded precipitation measurements from the nearest Texas Tech University - West Texas Mesonet Station at Silverton, rainfall amounts were:

April:	0.33"	July:	1.20"
May:	2.62"	August:	2.75"
June:	3.00"	September:	4.07"

Total rainfall: 13.97"

Insecticides: Temik was applied in-furrow at planting at 3.5 lb/acre. This location is in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Program.

Fertilizer management: 200 lb/acre 44-20-0-10 was applied pre-plant incorporated and approximately 170 lb/acre 32-0-0 was applied via fertigation during the growing season.

Plant growth regulators: A single application of Pix was made across all varieties at this location during the growing season.

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

Harvest: Plots were harvested on 25-November using a commercial John Deere 7445 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 $200/ton. Ginning costs did not include checkoff.

Seed and technology fees: Seed and technology costs were calculated using the appropriate seeding rate (3.8 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/seedindex.html .

Results and Discussion:

No significant differences were observed among varieties for plant population on 12-June (Table 1). On 31-July, significant differences were observed for plant height, height to node ratio and total fruiting nodes but not for the remaining plant measurements recorded. Plant measurement values reported represent averages from 10 plants per plot or 30 plants per variety. Plant height averaged 16.0" across all varieties and ranged from a high of 17.3" for Croplan Genetics 3220B2RF to a low of 14.4" for FiberMax 9180B2F. The test average for total mainstem nodes was 15.2 and resulted in an average height to node ratio of 1.05. Total number of fruiting nodes was greatest for AFD 5065B2F (10.0) and lowest for Deltapine 164B2RF (9.1).

Significant differences were observed for most yield, economic and HVI fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from a low of 30.8% to a high of 35.8% for AFD 5065B2F and PhytoGen 375WRF, respectively. Bur cotton yields averaged 3234 lb/acre with a high of 3416 lb/acre for PhytoGen 375WRF, and a low of 3174 lb/acre for All-Tex Apex B2RF. Lint yields varied with a low of 990 lb/acre (AFD 5065B2F) and a high of 1222 lb/acre (PhytoGen 375WRF). Lint loan values ranged from a low of $0.5153/lb (Stoneville 4498B2RF) to a high of $0.5677/lb (FiberMax 9180B2F). After adding lint and seed value, total value/acre for varieties ranged from a low of $710.90 for AFD 5065B2F to a high of $829.46 for PhytoGen 375WRF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $668.48 for PhytoGen 375WRF, to a low of $559.86 for AFD 5065B2F, a difference of $108.62.

Micronaire values ranged from a low of 3.4 for All-Tex Apex B2RF and Stoneville 4498B2RF to a high of 4.0 for NexGen 3348B2RF. Staple length averaged 35.1 across all varieties with a low of 34.1 for PhytoGen 375WRF and Stoneville 4498B2RF and a high of 35.9 for FiberMax 9180B2F. The highest percent

uniformity was observed for NexGen 3348B2RF (80.7%) and Deltapine 164B2RF had the lowest (78.1%), however, these differences were not significant. Strength values averaged 27.0 g/tex with a high of 28.0 g/tex for FiberMax 9180B2F and Stoneville 4498B2RF, and a low of 25.8 g/tex for Deltapine 164B2RF. Elongation ranged from a high of 10.9% for Stoneville 4498B2RF to a low of 9.2% for Deltapine 164B2RF. Leaf grades were mostly 1s and 2s at this location. Values for reflectance (Rd) and yellowness (+b) averaged 80.1 and 7.7, respectively. This resulted in color grades of mostly 21s and 31s 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 Wayne Reed for the use of his land, equipment and labor for this demonstration. Further assistance with this project was provided by Dr. John Gannaway - Texas AgriLife Research and Extension Center (Retired), 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. Stand count and in season plant map results from the replicated irrigated cotton variety demonstration, Wayne Reed Farm, Silverton, TX, 2008.

Variety	12-Jun		31-Jul						
	Plant stand		Plant height	Total mainstem	Height/node	Node of first	Total fruiting	Node of first	Nodes above first
	#/row ft	#/acre	inches	nodes	ratio	fruiting branch	nodes	position white flower	position white flower
AFD 5065B2F	2.8	36,155	16.6 ab	15.6	1.07 ab	6.6	10.0 a	8.6	6.9
All-Tex Apex B2RF	2.8	37,026	16.2 b	15.1	1.07 ab	6.7	9.4 b	8.4	6.8
Croplan Genetics 3220B2RF	2.7	34,848	17.3 a	15.3	1.13 a	6.7	9.5 b	8.6	6.7
Deltapine 164B2RF	2.7	35,545	16.7 ab	15.3	1.07 ab	7.2	9.1 b	8.7	6.6
FiberMax 9180B2F	2.7	34,412	14.4 c	15.0	0.97 b	6.8	9.2 b	8.6	6.4
NexGen 3348B2RF	2.7	35,284	14.6 c	14.9	0.97 b	6.6	9.4 b	8.3	6.6
PhytoGen 375WRF	2.8	36,852	15.8 b	15.3	1.03 ab	6.9	9.4 b	8.6	6.7
Stoneville 4498B2RF	2.7	35,371	16.4 ab	15.4	1.07 ab	7.0	9.4 b	8.7	6.7
Test average	2.7	35,686	16.0	15.2	1.05	6.8	9.4	8.6	6.7
CV, %	4.4	4.6	4.0	1.6	5.6	3.7	3.0	3.6	5.4
OSL	0.6337	0.5093	0.0007	0.1142	0.0485	0.1005	0.0628†	0.7623	0.8421
LSD 0.05	NS	NS	1.1	NS	0.10	NS	0.4	NS	NS

Means within a column with the same letter are not significantly different.
Plant map 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 irrigated cotton variety demonstration, Wayne Reed Farm, Silverton, TX, 2008.

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 ----------						
PhytoGen 375WRF	35.8	48.5	3416	1222	1656	0.5432	663.90	165.55	829.46	102.47	58.50	668.48	a
NexGen 3348B2RF	33.4	48.1	3234	1080	1556	0.5638	608.93	155.59	764.53	97.01	55.72	611.80	b
FiberMax 9180B2F	33.1	50.2	3224	1068	1619	0.5677	606.37	161.92	768.29	96.73	60.73	610.83	b
Croplan Genetics 3220B2RF	33.8	51.1	3190	1079	1629	0.5383	581.78	162.85	744.63	95.70	60.07	588.87	b
Deltapine 164B2RF	32.5	51.6	3195	1038	1648	0.5390	559.49	164.76	724.26	95.85	59.17	569.23	b
Stoneville 4498B2RF	33.9	49.8	3221	1091	1604	0.5153	561.78	160.40	722.17	96.62	60.20	565.36	b
All-Tex Apex B2RF	32.5	50.3	3174	1033	1597	0.5377	554.40	159.72	714.12	95.21	54.89	564.03	b
AFD 5065B2F	30.8	53.6	3219	990	1726	0.5442	538.31	172.59	710.90	96.57	54.48	559.86	b
Test average	33.2	50.4	3234	1075	1629	0.5436	584.37	162.92	747.29	97.02	57.97	592.31	
CV, %	2.3	2.7	3.2	3.3	3.2	4.2	5.1	3.2	4.4	3.2	--	5.2	
OSL	0.0001	0.0054	0.2183	<0.0001	0.0526†	0.2381	0.0031	0.0525†	0.0091	0.2195	--	0.0097	
LSD	1.3	2.4	NS	62	76	NS	52.15	7.55	57.71	NS	--	54.23	

For net value/acre, means within a column with the same letter are not significantly different.
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.
$200/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 cotton variety demonstration, Wayne Reed Farm, Silverton, TX, 2008.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
AFD 5065B2F	3.6	34.7	79.7	27.3	10.6	2.0	81.4	7.1	3.0	1.0
All-Tex Apex B2RF	3.4	35.7	79.3	26.0	9.9	1.0	81.5	7.4	2.3	1.0
Croplan Genetics 3220B2RF	3.5	35.4	80.1	27.2	10.4	1.3	81.2	7.7	2.3	1.0
Deltapine 164B2RF	3.5	35.4	78.1	25.8	9.2	1.0	80.4	7.8	2.7	1.0
FiberMax 9180B2F	3.7	35.9	80.1	28.0	9.4	1.7	81.5	7.4	2.7	1.0
NexGen 3348B2RF	4.0	35.2	80.7	27.6	9.7	2.7	78.0	7.9	3.0	1.0
PhytoGen 375WRF	3.7	34.1	79.9	26.2	9.8	1.7	79.9	7.7	3.0	1.0
Stoneville 4498B2RF	3.4	34.1	80.1	28.0	10.9	2.0	77.2	8.8	3.0	1.0
Test average	3.6	35.1	79.7	27.0	10.0	1.7	80.1	7.7	2.8	1.0
CV, %	5.2	2.2	1.2	2.1	2.7	25.8	1.2	5.7	--	--
OSL	0.0121	0.0769†	0.1211	0.0007	<0.0001	0.0045	0.0004	0.0109	--	--
LSD	0.3	1.1	NS	1.0	0.5	0.8	1.7	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, †denotes significance at the 0.10 level, NS - not significant.

AgriLIFE EXTENSION
Texas A&M System

Replicated Furrow Irrigated Cotton Variety Demonstration, Dimmitt, TX - 2008

Cooperators: Bryan and Rex Reinart

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

Castro County

Summary: Significant differences were observed for most yield and HVI lint quality parameters measured (Tables 1and 2). Lint turnout ranged from 20.7% to 23.3% for NexGen 3550RF and Deltapine 121RF, respectively. Lint yields varied with a low of 605 lb/acre for PhytoGen 375WRF, and a high of 762 lb/acre for NexGen 1556RF. Lint loan values ranged from a low of $0.3855/lb (Croplan Genetics 3020B2RF) to a high of $0.4353/lb (NexGen 1556RF). After subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $328.80/acre for NexGen 1556RF, to a low of $190.64/acre for PhytoGen 375WRF, a difference of $138.16. Micronaire values ranged from a low of 2.3 for FiberMax 9063B2F and PhytoGen 375WRF to a high of 2.8 for NexGen 1551RF and NexGen 1556RF. Staple length averaged 36.6 across all varieties with a low of 35.2 for Croplan Genetics 3020B2RF and a high of 37.9 for FiberMax 9058F. The highest percent uniformity was observed for NexGen 1556RF (82.0%) and PhytoGen 375WRF had the lowest (79.6%). Strength values averaged 27.3 g/tex with a high of 29.4 g/tex for NexGen 1556RF and a low of 24.7 g/tex for Croplan Genetics 3020B2RF. 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 furrow irrigated production in the Texas High Plains.

Materials and Methods:

Varieties: Croplan Genetics 3020B2RF, Deltapine 104B2RF, Deltapine 121RF, FiberMax 9058F, FiberMax 9180B2F, FiberMax 9063B2F, NexGen 1551RF, NexGen 1556RF, NexGen 3550RF, PhytoGen 375WRF

Experimental design:	Randomized complete block with 3 replications
Seeding rate:	57,000 seed/acre or, 4.4 seeds/row-ft in 40-inch row spacing
Plot size:	4 rows by length of field
Planting date:	26-May
Weed management:	Treflan was applied pre-plant incorporated at 1.0 pt/acre and Prowl was applied at planting at 1.25 pt./acre. Three applications of Roundup Ultra Max were applied at 1.0 qt/acre with ammonium sulfate during the growing season.
Irrigation:	Pre-watered by furrow irrigating every row. Irrigated every other row 3 times during the growing season.
Rainfall:	Had two rainfall events during the months of June and August for a total of about 2.5"
Insecticides:	Temik was applied infurrow at planting at 3.5 lb/acre. No other insecticides were applied.
Fertilizer management:	10 tons of manure.
Plant growth regulators:	A single application of Pix was made across all varieties at this location during the growing season.
Harvest aids:	1.5 qt. of Boll'd/acre
Harvest:	Plots were harvested on 19-November using a commercial John Deere 7460 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 $200/ton. Ginning costs did not include checkoff.

Seed and technology fees: Seed and technology costs were calculated using the appropriate seeding rate (4.4 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/seedindex.html .

Results and Discussion:

Significant differences were observed for most yield, economic and HVI fiber quality parameters measured (Tables 1 and 2). Lint turnout ranged from 20.7% to 23.3% for NexGen 3550RF and Deltapine 121RF, respectively. Bur cotton yields averaged 3166 lb/acre with a high of 3629 lb/acre for Deltapine 104B2RF, and a low of 2647 lb/acre for Deltapine 121RF. Lint yields varied with a low of 605 lb/acre for PhytoGen 375WRF and a high of 762 lb/acre for NexGen 1556RF. Lint loan values ranged from a low of $0.3855/lb (Croplan Genetics 3020B2RF) to a high of $0.4353/lb (NexGen 1556RF). After adding lint and seed values, the total value/acre was $402.90/acre across all varieties. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $328.80/acre for NexGen 1556RF, to a low of $190.64/acre for PhytoGen 375WRF, a difference of $138.16.

Micronaire values ranged from a low of 2.3 for FiberMax 9063B2F and PhytoGen 375WRF to a high of 2.8 for NexGen 1551RF and NexGen 1556RF. Staple length averaged 36.6 across all varieties with a low of 35.2 for Croplan Genetics 3020B2RF and a high of 37.9 for FiberMax 9058F. The highest percent uniformity was observed for NexGen 1556RF (82.0%) and PhytoGen 375WRF had the lowest (79.6%). Strength values averaged 27.3 g/tex with a high of 29.4 g/tex for NexGen 1556RF, and a low of 24.7 g/tex for Croplan Genetics 3020B2RF. Elongation ranged from a high of 11.1% for Deltapine 104B2RF to a low of 8.7% for FiberMax 9058F. Leaf grades were mostly 2s at this location. Values for reflectance (Rd) and yellowness (+b) averaged 70.8 and 12.4, respectively. This resulted in color grades of mostly 23s and 24s across varieties. These color grades may be attributed to an earlier than normal freeze and limited number of heat units late in the growing season resulting in poor fiber development for later maturing bolls.

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. However, the growing season was shortened by a somewhat early freeze and heat units were limited due to below normal temperatures in August and September. 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 Bryan and Rex Reinart for the use of their land, equipment and labor for this demonstration. Further assistance with this project was provided by Dr. John Gannaway - Texas AgriLife Research and Extension Center (Retired), 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 furrow irrigated cotton variety demonstration, Bryan and Rex Reinart Farms, Dimmitt, TX, 2008.

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 ----------						
NexGen 1556RF	22.3	43.5	3421	762	1488	0.4353	331.96	148.79	480.74	102.64	49.31	328.80	a
NexGen 1551RF	21.2	40.9	3220	683	1316	0.4213	290.25	131.63	421.89	96.61	49.31	275.96	b
Deltapine 104B2RF	20.9	38.8	3629	758	1408	0.4072	309.09	140.77	449.86	108.88	67.45	273.53	bc
FiberMax 9058F	21.2	36.1	3271	694	1181	0.4240	295.34	118.09	413.43	98.14	59.28	256.02	bc
FiberMax 9180B2F	21.3	36.7	3319	708	1217	0.4148	293.67	121.69	415.36	99.57	69.23	246.56	bcd
NexGen 3550RF	20.7	39.1	3093	640	1209	0.4035	258.24	120.96	379.20	92.80	46.62	239.79	bcde
FiberMax 9063B2F	21.1	37.3	3220	680	1201	0.4162	283.11	120.05	403.16	96.59	69.23	237.34	bcde
Croplan Genetics 3020B2RF	22.0	39.3	3129	688	1229	0.3855	265.23	122.90	388.13	93.87	68.47	225.78	cde
Deltapine 121RF	23.3	36.0	2647	617	953	0.3938	243.16	95.32	338.48	79.40	57.49	201.59	de
PhytoGen 375WRF	22.3	36.4	2715	605	988	0.3948	239.92	98.87	338.79	81.46	66.69	190.64	e
Test average	21.6	38.4	3166	683	1219	0.4096	281.00	121.91	402.90	95.00	60.31	247.60	
CV, %	6.7	2.9	8.3	8.3	8.2	3.2	9.6	8.2	9.1	8.3	--	11.7	
OSL	0.5061	<0.0001	0.0074	0.0391	0.0001	0.0042	0.0104	0.0001	0.0034	0.0074	--	0.0009	
LSD	NS	1.9	453	97	172	0.0223	46.11	17.25	62.74	13.58	--	49.67	

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.
$200/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 furrow irrigated cotton variety demonstration, Bryan and Rex Reinart Farms, Dimmitt, TX, 2008.

Variety	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 3020B2RF	2.5	35.2	81.0	24.7	10.4	1.3	69.2	12.9	2.0	3.7
Deltapine 104B2RF	2.4	36.3	81.1	27.3	11.1	3.3	71.5	12.0	2.0	3.0
Deltapine 121RF	2.6	35.6	81.1	27.4	10.2	2.0	68.5	13.7	2.0	4.0
FiberMax 9058F	2.4	37.9	80.3	27.4	8.7	2.0	72.5	11.8	2.0	2.7
FiberMax 9063B2F	2.3	37.4	80.6	28.0	9.3	2.3	73.4	11.6	2.0	3.0
FiberMax 9180B2F	2.4	37.5	81.3	27.4	9.6	2.3	72.5	11.6	2.0	3.0
NexGen 1551RF	2.8	36.9	81.5	28.9	9.8	1.0	70.3	12.5	2.3	3.3
NexGen 1556RF	2.8	36.7	82.0	29.4	10.1	1.7	71.7	12.1	2.0	3.0
NexGen 3550RF	2.5	37.0	80.7	27.0	10.0	3.3	69.8	12.3	2.3	3.3
PhytoGen 375WRF	2.3	35.4	79.6	25.4	9.6	2.3	68.8	13.4	2.0	3.7
Test average	2.5	36.6	80.9	27.3	9.9	2.2	70.8	12.4	2.1	3.3
CV, %	4.2	1.3	0.8	3.6	2.0	27.1	1.7	3.6	--	--
OSL	<0.0001	<0.0001	0.0176	0.0005	<0.0001	0.0018	0.0007	<0.0001	--	--
LSD	0.2	0.8	1.1	1.7	0.3	1.0	2.1	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.

AgriLIFE EXTENSION
Texas A&M System

Replicated Irrigated Roundup Ready Flex Cotton Variety Demonstration, Sunray, TX – 2008

Cooperator: Kerry Cartrite

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

Sherman County

Summary: Average lint yield was 1,042 lb/acre and varied from 919 lb/acre for Deltapine 121RF to 1,212 lb/acre for NexGen 1572RF. Average lint turnout was 25.2%. Micronaire was mostly 2.4 units with the exception of AFD 5064F at 2.8 units. Net value (lint and seed value minus ginning and seed + technology fee costs) ranged from $359/acre to $582/acre depending on variety. Highest net value was obtained with NexGen 1572RF, FM 9058F and NexGen 3550RF.

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

Materials and Methods:

Varieties: AFD 5064F, All-Tex Epic RF (tested as All-Tex 65333RF), Croplan Genetics 3035RF, Deltapine 121RF, Dyna-Gro 2400RF, FiberMax 9058F, NexGen 1572RF, NexGen 3550RF, PhytoGen 315RF,

Experimental design: Randomized complete block with 3 replications

Seeding rate: 80,000 seed/acre in 30-inch rows

Plot size: 8 rows by approximately 600 ft

Planting date: 6-May

Weed management:	Roundup WeatherMax (32 oz/acre) + Dual (1 pt/acre) were applied preemergence. Two additional applications of Roundup WeatherMax at 32 oz/acre were applied over-the-top during the season.
Rainfall and irrigation:	Seven inches of irrigation water were applied preplant and 5 inches were applied during the growing season. Rainfall totaled 13.92 inches during the growing season (1-May through 26-November) as recorded by the Texas AgriLife Research weather station near Etter.
Insecticides:	Temik at 3 lb/acre was applied in-furrow at planting, and Orthene was applied at 4 oz/acre twice during the season.
Fertilizer management:	100 lbs/acre 11-52-0 was applied in the spring prior to planting. In addition, 10 gal/acre 32-0-0 was applied through the pivot during the growing season.
Plant growth regulators:	None applied
Harvest aids:	Bollbuster (ethephon) was used prior to harvest.
Harvest:	Plots were harvested on 1-December using a commercial John Deere 7460 stripper with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine plot weights. Plot yields were converted to lb/acre.
Gin turnout:	Samples from each plot were ginned at the Texas AgriLife Research and Extension Center near Lubbock to determine gin turnouts.
Fiber analysis:	Lint samples were submitted to the 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.

Results and Discussion:

Average Lint yield at this location was 1,042 lb/acre, and was achieved with 12 inches of irrigation water. Lint turnout averaged 25.2% with a range of 23.5% to 26.6% (Table 1). Lint yield ranged from a low of 919 lb/acre with Deltapine 121RF to a high of 1,212 lb/acre with NexGen 1572RF. Lint loan value ranged from $0.41 to $0.45.

Net value (lint and seed value minus ginning and seed + technology costs) ranged from a low of $359 for Deltapine121RF and a high of $582 with NexGen 1572RF (Table 1). Other varieties with a high net value were FiberMax 9058F ($536) and NexGen 3550RF ($494).

Differences in fiber properties influenced the loan value obtained for each variety (Table 2). Micronaire was similar at 2.4 units for all varieties except AFD 5064F at 2.8 units. Staple was generally around 37.4 with the exception of FiberMax 9058F and NexGen 3550RF that were over 39. Fiber yellowness and color also affected loan value. Because of considerable amount of variability in grab samples, a leaf grade of 3.0 was entered for all varieties.

Acknowledgments:

Appreciation is expressed to Kerry Cartrite for the use of his land, equipment and labor for this project. Texas Tech University Fiber and Biopolymer Research Institute provided further assistance with this project.

Disclaimer Clause:

Trade names of commercial products used in this report are included only for better understanding and clarity. References to commercial products or trade names are 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 could occur where conditions vary.

Table 1. Harvest results from the replicated irrigated cotton variety demonstration, Kerry Cartrite Farm, Sunray, TX, 2008.

Variety	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/tech. cost	Net value
	-------%-------		----------lb/acre----------			$/lb	----------$/acre----------					
NexGen 1572RF	24.4	52.2	4,970	1,212	2,597	0.4435	537.73	259.67	797.40	149.11	65.42	582.87 a
FiberMax 9058F	26.2	51.2	4,404	1,154	2,254	0.4555	525.92	225.43	751.35	132.11	83.20	536.03 ab
NexGen 3550RF	24.4	50.7	4,324	1,054	2,191	0.4463	470.28	219.05	689.33	129.73	65.42	494.18 abc
AFD 5064F	23.5	48.8	4,310	1,011	2,100	0.4557	460.43	210.00	670.43	129.29	73.20	467.94 bcd
PhytoGen 315RF	24.8	50.2	4,052	1,005	2,030	0.4422	443.86	203.03	646.89	121.54	80.38	444.96 cde
Croplan Genetics 3035RF	25.7	49.2	4,037	1,037	1,983	0.4322	449.20	198.30	647.50	121.10	82.12	444.29 cde
Dyna-Gro 2400RF	25.1	49.6	4,031	1,015	1,998	0.4297	437.66	199.85	637.51	120.92	81.74	434.84 cde
All-Tex Epic RF	26.6	52.8	3,670	973	1,931	0.4198	408.71	193.08	601.79	110.09	65.85	425.85 cde
Deltapine 121RF	26.1	47.0	3,541	919	1,658	0.4137	380.40	165.82	546.22	106.23	80.68	359.31 e
Test Avg.	25.2	50.2	4,149	1,042	2,082	0.4376	457.13	208.25	665.38	124.46	75.33	465.59
CV	6.9	5.44	5.44	8.7	5.36	3.86	10.31	5.37	8.57	5.45	--	11.22
OSL	0.4357	0.318	0.0001	0.0313	0.0001	0.0728	0.0174	0.0001	0.0025	0.0001	--	0.0041
LSD (P=.05)	NS	NS	391	157	193	NS	81.60	19.35	98.74	11.74	--	90.43

For net value/acre, means followed by same letter do not significantly differ at the 0.05 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.

Assumes:
$3.00/cwt ginning cost.
$200/ton for seed.
Value for lint base on CCC loan value from grab samples and FBRI HVI results.

Table 2. HVI fiber property results from the replicated irrigated cotton variety demonstration, Kerry Cartrite Farm, Sunray, TX, 2008.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf *	Rd	+b	Color Grade	
	units	32nds inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
NexGen 1572RF	2.4	37.9	80.2	27.3	10.5	3.0	75.5	7.3	4.0	1.0
FiberMax 9058F	2.4	39.7	80.4	28.0	9.2	3.0	75.9	9.1	2.7	1.3
NexGen 3550RF	2.4	39.0	80.0	28.2	9.8	3.0	74.6	9.8	2.7	1.7
AFD 5064F	2.8	37.1	81.0	29.1	10.4	3.0	73.6	9.4	3.3	2.0
PhytoGen 315RF	2.4	36.8	79.1	26.6	9.7	3.0	75.0	10.5	2.3	2.0
Croplan Genetics 3035RF	2.4	37.2	79.4	26.8	10.9	3.0	75.8	11.2	1.3	2.3
Dyna-Gro 2400RF	2.4	37.2	79.2	26.5	11.1	3.0	76.6	11.3	1.3	2.3
All-Tex Epic RF	2.3	37.2	79.3	26.5	10.6	3.0	75.3	11.9	1.3	2.7
Deltapine 121RF	2.4	37.7	80.5	28.9	10.5	3.0	72.8	11.7	2.0	3.0
Test avg.	2.4	37.8	79.9	27.5	10.3	3.0	75.0	10.2	2.3	2.0
CV, %	2.8	1.4	0.8	2.2	2.2	--	1.6	5.3	--	--
OSL	0.0001	0.0001	0.0112	0.0002	0.0001	--	0.0284	0.0001	--	--
LSD (P=.05)	0.1	0.9	1.0	1.1	0.4	--	2.0	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, NS - not significant.
*Leaf grade was set the same for all varieties based on field average.

AgriLIFE EXTENSION
Texas A&M System

Replicated Irrigated Roundup Ready Flex Cotton Variety Demonstration, Panhandle, TX - 2008

Cooperator: Charles Bowers

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

Carson County

Summary: Lint yield ranged from a low of 216 lb/acre with Croplan Genetics 3035RF to a high of 707 lb/acre with NexGen 1572RF. Lint turnout varied considerably, ranging from 20.1% to 27.8%. Seed yield averaged 821 lb/acre. Net value (lint and seed value minus ginning and seed and technology fee costs) ranged from $13.97/acre to $258.58/acre among varieties. Highest net value was obtained with NexGen 1572RF followed by AFD 5064F and FiberMax 9058F.

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

Materials and Methods:

Varieties: AFD 5064F, All-Tex Epic RF (tested as All-Tex 65333RF), Croplan Genetics 3035RF, Deltapine 121RF, Dyna-Gro 2400RF, FiberMax 9058F, NexGen 1572RF, NexGen 3410RF, NexGen 3550RF, PhytoGen 315RF

Experimental design: Randomized complete block with 3 replications

Seeding rate: 65,000 seeds/acre on 30-inch rows

Plot Size: 6 rows approximately 591 ft in length

Planting date: 22-May

Rainfall and irrigation: 3.5 inches rainfall. 6.5 inches of irrigation applied through center pivot.

Weed management:	1.5 qt/acre Dual + 1 qt/acre Direx applied pre-emergence. Generic glyphosate at 32 oz/acre was applied three times during the season.
Insecticides:	4 oz/acre Acephate
Fertilizer management:	Applied 50 lbs N/acre plus 25 lbs P/acre during strip-till operation. At planting applied 10 lbs N/acre plus 5 lbs P/acre. An additional 15 lbs N/acre applied through pivot irrigation.
Plant growth regulators:	6 oz/acre mepiquat chloride
Harvest aids:	None
Harvest:	Plots were harvested on 14-January using a commercial John Deere 7460 with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine plot weights. Plot weights were converted to lb/acre basis.
Gin turnout:	Samples from each plot were ginned at the Texas AgriLife Research and Extension Center near Lubbock to determine gin turnouts.
Fiber analysis:	Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis and Commodity Credit Corporation (CCC) loan values were determined for each variety by plot.

Results and Discussion:

Soil moisture was excellent at planting. However, only 3.5 inches of rainfall occurred during the season. This was supplemented with 6.5 inches of irrigation. Herbicide drift injury on the east side of the field resulted in the loss of six plots. This in turn increased the variability of the test.

Lint turnout averaged 23.7%, ranging from 20.1% with Croplan Genetics 3035RF to 27.8% with FiberMax 9058F. Highest lint yield was achieved with NexGen 1572RF (707 lb/acre) and FiberMax 9058F (638 lb/acre). Average lint yield was 449 lb/acre (Table 1). Seed yield averaged 821 lb/acre. Lint loan value ranged from $0.35 to $0.38. Net value (lint plus seed value minus ginning, seed, and technology fee costs) ranged from a low of $13.97 for Dyna-Gro 2400RF to a high of $258.58 for NexGen 1572RF. Two other varieties with a net value greater than $200/acre were AFD 5064F ($201.16) and FiberMax 9058F ($200.91).

Differences in fiber properties influenced the loan value obtained for each variety (Table 2). Micronaire was similar for most varieties at approximately 2.3, with the exception of AFD 5064F at 2.6 and NexGen 3550RF at 2.5. Staple averaged 34.6 across all varieties, with NexGen 3410RF, FiberMax 9058F, and NexGen 1572RF resulting in 36.5, 35.8 and 35.4 32^{nds} inches, respectively. Fiber yellowness (+b) and color also affected loan value. Because of considerable variability in grab samples, leaf grades for all varieties were set at field average, 5.0

Acknowledgments:

Appreciation is expressed to Charles Bowers for the use of his land, equipment and labor for this project. Further assistance with this project was provided by Dr. John Gannaway - Texas AgriLife Research and Extension Center (Retired), 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 Roundup Ready Flex cotton variety demonstration, Charles Bowers Farm, Panhandle, TX, 2008.

Variety	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/tech. cost	Net value	
	-------%-------		----------lb/acre----------			$/lb	----------$/acre----------						
NexGen 1572RF	26.0	50.7	2696	707	1367	0.3620	255.93	136.70	392.63	80.89	53.16	258.58	a
AFD 5064F	26.6	47.5	2209	583	1048	0.3824	222.16	104.75	326.91	66.27	59.48	201.16	b
FiberMax 9058F	27.8	46.6	2271	638	1060	0.3597	230.67	105.97	336.65	68.14	67.60	200.91	b
NexGen 3550RF	26.0	48.3	1884	491	912	0.3567	174.92	91.19	266.12	56.52	53.16	156.44	c
NexGen 3410RF	23.7	47.3	2116	501	1000	0.3523	176.46	100.02	276.48	63.48	59.48	153.52	c
Deltapine 121RF	26.7	44.1	1495	403	655	0.3609	145.59	65.49	211.08	44.84	65.56	100.69	d
PhytoGen 315RF	26.3	43.7	1510	397	662	0.3525	140.00	66.16	206.16	45.30	65.31	95.54	d
All-Tex Epic RF	23.1	43.5	1236	290	540	0.3514	102.74	54.00	156.74	37.09	53.51	66.14	de
Croplan Genetics 3035RF	20.1	42.4	1100	216	465	0.3642	78.56	46.50	125.07	35.66	66.44	37.28	ef
Dyna-Gro 2400RF	22.1	42.4	1189	261	504	0.3452	88.93	50.44	139.38	33.01	78.08	13.97	f
Test Avg.	24.8	45.7	1771	449	821	0.3587	161.60	82.12	243.72	53.12	62.18	128.42	
CV	7.46	4.21	6.92	11.99	8.59	2.42	11.97	8.59	10.48	6.92	--	17.63	
OSL	0.0047	0.0019	0.0001	0.0001	0.0001	0.0123	0.0001	0.0001	0.0001	0.0001	--	0.0001	
LSD (P=.05)	0.033	0.342	41.97	95.739	125.519	0.0154	34.417	12.552	45.451	6.5441	--	40.261	

For net value, means within a column with the same letter are not significant at the 0.05 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.

Assumes:
$3.00/cwt ginning cost.
$200/ton for seed.
Value for lint base on CCC loan value from grab samples and FBRI HVI results.

Table 2. HVI fiber property results from the replicated irrigated Roundup Ready Flex cotton variety demonstration, Charles Bowers Farm, Panhandle, TX, 2008.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf *	Rd	+b	Color Grade	
	units	32nds inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
NexGen 1572RF	2.3	35.4	78.2	24.2	9.0	5.0	70.8	10.7	3.0	3.0
AFD 5064F	2.6	34.5	81.0	26.6	9.4	5.0	68.7	11.3	3.4	2.9
FiberMax 9058F	2.4	35.8	78.4	24.8	8.7	5.0	70.3	11.2	3.0	3.0
NexGen 3550RF	2.5	34.6	78.8	24.5	9.1	5.0	67.5	10.9	3.7	3.0
NexGen 3410RF	2.2	36.5	78.3	24.7	8.6	5.0	67.7	11.4	3.7	3.0
Deltapine 121RF	2.3	34.6	79.7	24.6	8.9	5.0	68.5	13.4	2.0	3.5
PhytoGen 315RF	2.3	33.0	77.8	22.8	8.3	5.0	68.5	12.2	3.0	3.0
All-Tex Epic RF	2.1	33.3	77.6	21.2	8.4	5.0	70.8	11.9	2.4	2.9
Croplan Genetics 3035RF	2.1	34.3	76.2	22.7	8.5	5.0	72.1	11.0	2.5	2.5
Dyna-Gro 2400RF	2.2	33.9	77.1	23.0	9.2	5.0	66.9	11.0	3.5	3.0
Test avg.	2.3	34.6	78.3	23.9	8.8	5.0	69.2	11.5	3.0	3.0
CV, %	3.8	2.2	1.1	4.7	4.4	--	3.1	5.2	--	--
OSL	0.0001	0.0027	0.0012	0.0004	0.0531	--	0.1518	0.0042	--	--
LSD (P=.05)	0.157	1.3499	1.545	1.532	NS	--	NS	1.056	--	--

OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.05 level, NS - not significant.
*Leaf grade was set the same for all varieties based on field average.

AgriLIFE EXTENSION
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2008 Comparison of Twelve Cotton Varieties under Center Pivot Irrigation and Dryland Crop Production

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Cooperators: Jud Cheuvront and Rick Orson

Introduction

Gaines County is the largest producer of cotton in the state of Texas. Approximately thirty-five percent of the cotton planted in Gaines County is under dryland production. The remaining cotton is produced under center pivot irrigation with a majority of the fields produced with minimal amounts of irrigation water. In 2008 approximately 137,985 of the 244,240 acres of cotton planted in Gaines County were failed due to excessively dry conditions, hail, wind and blowing sand. Therefore, growers deem it necessary to evaluate variety performance in order to maintain yields and net profits at a time when water availability is scarce and input costs are drastically increasing. New cotton varieties are continually being produced and marketed by various seed companies. The quick turn around in varieties has resulted in a limited amount of on-farm tests to evaluate these new varieties when they first enter the marketplace. As a result growers have limited data to base their seed selections on. Variety selection is one of the most important decisions a grower makes during a year. Variety selections should be based on yield and fiber qualities. Therefore, two large plot on-farm trials were conducted in Gaines County to evaluate twelve cotton varieties. The objectives of this research were to evaluate the performance of commercially available cotton varieties in fields with varying levels of water and compare the net returns between varieties in fields under center pivot irrigation and dryland production. Yield and fiber qualities were used to determine the net value per acre for each variety.

Materials and Methods

Field trials were conducted in Gaines County, TX in 2008. Trial 1 had a seeding rate of 4.3 seed per row-foot and was planted on 16 May with 5 lb of Temik 15G placed in the furrow at planting. Trial 2 had a seeding rate of 2.75 seed per row-foot and was planted on 14 May. No Temik 15G was applied. Trials 1 and 2 had 36 and 40 inch row spacings, respectively. Trial 1 was irrigated using a pivot irrigation system and Trial 2 was produced under dryland cropping practices in a plant 2 rows and skip 1 row pattern. Plots were 12-rows and 8-rows wide, respectively, and extended the length of the field. Twelve varieties were evaluated in each trial. Plots were arranged in a randomized complete block design with 3 replications. Within each test, the production practices were the same for all varieties. Both fields had a non-damaging level of the root-knot nematode

(*Meloidogyne incognita*). Trial 1 and Trial 2 were harvested on 13 November and 28 October, respectively. On 24 October temperatures dropped below 30°F. All plots were weighed separately using a Lee weigh wagon. Sub-samples were taken from each plot. All sub-samples were weighed and then ginned using a sample gin with a lint cleaner, burr extractor and stick machine. Ginned lint was weighed and lint and seed turnouts were calculated. Lint yield and seed yield was determine by multiplying the respective turn out with field plot weights. Approximately 50 gram lint samples were randomly collected for fiber quality analysis. Fiber analysis was conducted by the Texas Tech University Fiber & Biopolymer Research Institute and Commodity Credit Corporation (CCC) lint loan values were determined for each plot. Lint value was determined by multiplying the loan value with the lint yield. Seed value was determined using a value of $200/ton for seed. Ginning Cost was determined using $3.00/cwt ginning cost. Seed and technology cost was calculated using the 2008 Seed Cost Comparison Worksheet courtesy of the Plains Cotton Growers Inc. Net value was determined by adding lint value and seed value and subtracting ginning cost and seed fees and technology fees. Statistical analysis of data was conducted using SAS 9.1 for windows, using PROC GLM.

Results and Discussion

In Trial 1, lint yield ranged from 695 to 1007 lb/acre (average of 777 lb lint/acre) (Table 1), while in Trial 2, lint yield ranged from 308 to 410 lb/acre (average of 359 lb lint/acre) (Table 3). In Trial 1, net value ranged from $375 to $580/acre (difference of $205/acre) (Table 1), while in Trial 2, net value ranged from $146 to $205/acre (difference of $59) (Table 3).

NexGen 3348B2RF ranked 1st of 12 varieties in Trial 1 (center pivot irrigated), but ranked 11th in Trial 2 (dryland production) (Table 1 & 3). Fibermax 1740B2RF and Fibermax 1880B2RF ranked 2nd and 3rd in Trial 1, but ranked 6th and 8th, respectively, in Trial 2. Deltapine 174RF, and Deltapine 161B2RF ranked 1st and 2nd in Trial 2, but ranked 5th and 4th in Trial 1. Phytogen 375WRF and Deltapine 141B2RF ranked 3rd, and 4th in Trial 2, but ranked 8th and 7th in Trial 1. Americot 1532 B2RF, Phytogen 485WRF, All-Tex Summit B2RF, and Stoneville 5458B2RF net values were not significantly different than the lowest net values in both of the trials (Table 1 & 3). Variety selection is one of the most important decisions a producer must make. Water use is one factor that can significantly impact variety performance. Continued evaluations of these varieties are needed.

Acknowledgments

We would like to acknowledge and thank Jud Cheuvront and Rick Orson for planting, maintaining and harvesting these trials. We would also like to thank Jody Anderson for his assistance in planting and harvesting these trials and Ronnie Wallace for assisting us in measuring plot acreages.

Table 1. Harvest Results from Trial 1 under center pivot irrigation.

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 ----------						
NexGen 3348B2RF	39.3	59.3	2582	1007	1515	0.5568	560.67	151.56	712.22	77.45	55.01	579.76	a
FiberMax 1740B2F	38.4	51.5	2435	935	1255	0.5662	529.79	125.49	655.28	73.04	59.96	522.28	b
FiberMax 1880B2F	34.8	54.6	2473	860	1349	0.5723	491.74	134.90	626.64	74.19	59.96	492.49	b
Deltapine 161B2RF	34.1	53.7	2235	764	1202	0.5685	434.13	120.27	554.40	67.06	58.42	428.92	c
Deltapine 174RF	37.2	51.9	2003	746	1039	0.5667	422.27	103.88	526.15	60.10	49.79	416.26	cd
Americot 1532B2RF	35.4	53.5	2063	732	1108	0.5742	419.95	110.76	530.70	61.89	56.94	411.87	cd
Deltapine 141B2RF	33.8	54.3	2171	733	1177	0.5692	417.46	117.72	535.18	65.12	58.42	411.64	cd
PhytoGen 375WRF	37.6	51.6	1928	726	993	0.5700	413.45	99.33	512.79	57.84	57.76	397.19	cd
PhytoGen 485WRF	34.7	55.5	2039	708	1132	0.5667	401.24	113.22	514.46	61.17	57.76	395.52	cd
All-Tex Summit B2RF	34.5	55.7	2007	695	1119	0.5702	396.29	111.88	508.17	60.22	54.19	393.76	cd
Stoneville 5458B2RF	35.9	51.7	1991	714	1029	0.5710	407.69	102.88	510.57	59.74	59.43	391.40	cd
Stoneville 4498B2RF	35.3	53.4	2000	707	1068	0.5487	387.49	106.82	494.31	59.99	59.43	374.88	d
Test average	35.9	53.9	2161	777	1165	0.5667	440.18	116.56	556.74	64.82	57.26	434.66	
CV, %	4.5	5.3	5.1	5.3	5.9	1.8	5.3	5.9	5.3	5.1	--	6.5	
OSL	0.0047	0.1048	<0.0001	<0.0001	<0.0001	0.2019	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	
LSD	2.7	NS	186	70	117	NS	39.69	11.66	50.19	5.58	--	47.53	

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.
$200/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 Trial 1 under center pivot irrigation.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Americot 1532B2RF	4.0	36.8	81.2	27.4	10.3	1.7	79.6	8.3	2.3	1.0
All-Tex Summit B2RF	4.2	35.9	80.5	27.9	10.3	1.3	81.3	7.9	2.0	1.0
Deltapine 141B2RF	4.1	35.2	80.5	27.8	10.7	1.3	79.6	8.7	2.0	1.0
Deltapine 161B2RF	4.2	35.9	80.8	26.7	11.2	1.7	79.0	8.4	2.7	1.0
Deltapine 174RF	4.1	35.7	79.9	27.1	10.3	1.7	79.9	8.2	2.3	1.0
FiberMax 1740B2F	4.4	36.6	81.4	27.4	10.9	1.3	79.6	8.1	2.3	1.0
FiberMax 1880B2F	4.4	35.3	80.5	27.2	11.3	1.3	80.6	8.3	2.0	1.0
NexGen 3348B2RF	4.1	35.4	80.0	27.2	10.3	1.0	79.8	8.3	2.3	1.0
PhytoGen 375WRF	4.5	35.8	79.8	26.7	10.3	1.0	80.2	8.3	2.3	1.0
PhytoGen 485WRF	4.5	36.0	80.4	28.3	10.2	1.3	78.4	8.9	2.3	1.0
Stoneville 4498B2RF	4.0	35.5	79.8	27.2	10.8	1.0	77.1	9.7	2.0	1.7
Stoneville 5458B2RF	4.1	36.1	80.1	27.6	10.2	1.0	79.1	8.2	2.3	1.0
Test average	4.2	35.9	80.4	27.4	10.6	1.3	79.5	8.5	2.2	1.1
CV, %	7.6	2.4	1.3	5.1	6.3	43.5	2.0	7.1	--	--
OSL	0.4183	0.5068	0.6844	0.9669	0.4222	0.7692	0.2598	0.1149	--	--
LSD	NS	NS	NS	NS	NS	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, NS - not significant.

Table 3. Harvest Results from Trial 2 under dryland production.

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 174RF	34.6	44.9	1184	410	531	0.5435	223.63	53.09	276.72	35.52	36.25	204.95 a
Deltapine 161B2RF	31.6	48.6	1242	393	603	0.5710	224.33	60.33	284.66	37.26	42.53	204.87 a
PhytoGen 375WRF	33.5	44.7	1166	390	522	0.5450	213.14	52.22	265.36	34.98	42.05	188.33 ab
Deltapine 141B2RF	31.8	48.0	1177	373	565	0.5557	207.28	56.48	263.76	35.29	42.53	185.94 ab
Stoneville 4498B2RF	31.7	46.1	1143	364	529	0.5560	202.61	52.94	255.55	34.27	43.27	178.02 bc
FiberMax 1740B2F	34.8	46.3	1059	368	491	0.5473	201.96	49.07	251.03	31.77	43.65	175.61 bc
Americot 1532B2RF	31.0	47.5	1092	337	517	0.5657	191.10	51.71	242.81	32.74	41.45	168.61 bcd
FiberMax 1880B2F	31.6	49.9	1061	335	529	0.5638	188.97	52.93	241.90	31.83	43.65	166.42 bcd
PhytoGen 485WRF	30.5	47.3	1128	344	532	0.5418	187.16	53.22	240.38	33.83	42.05	164.50 bcd
Stoneville 5458B2RF	33.9	47.3	1054	357	499	0.5162	184.99	49.92	234.92	31.62	43.27	160.03 cd
NexGen 3348B2RF	31.7	47.6	1034	327	493	0.5443	178.35	49.30	227.65	31.01	40.05	156.60 cd
All-Tex Summit B2RF	31.0	48.5	992	308	481	0.5390	166.78	48.11	214.89	29.75	39.45	145.70 d
Test average	32.3	47.2	1111	359	524	0.5491	197.52	52.44	249.97	33.32	41.68	174.97
CV, %	1.7	2.1	6.0	7.0	6.9	2.5	6.8	6.9	6.7	5.9	--	8.5
OSL	<0.0001	<0.0001	0.0040	0.0017	0.0247	0.0055	0.0005	0.0244	0.0015	0.0040	--	0.0012
LSD	0.9	1.7	112	42	61	0.0229	22.79	6.11	28.39	3.36	--	25.30

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.
$200/ton for seed.
Value for lint based on CCC loan value from grab samples and FBRI HVI results.

Table 4. HVI fiber property results from Trial 2 under dryland production.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32nds inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Americot 1532B2RF	4.3	35.6	80.5	28.0	10.2	2.3	78.0	8.6	2.7	1.0
All-Tex Summit B2RF	4.3	34.0	81.0	26.9	10.5	1.7	77.1	8.7	3.0	1.0
Deltapine 141B2RF	4.0	35.9	79.7	29.2	10.3	3.3	77.9	8.0	3.0	1.0
Deltapine 161B2RF	4.4	36.0	80.1	30.7	9.6	2.0	78.2	8.2	3.0	1.0
Deltapine 174RF	4.6	34.4	79.8	27.5	10.6	2.3	76.9	8.7	3.0	1.0
FiberMax 1740B2F	4.7	34.1	80.7	28.3	9.7	1.0	78.5	8.6	2.7	1.0
FiberMax 1880B2F	4.3	35.4	80.5	29.5	9.6	2.0	78.6	8.3	2.7	1.0
NexGen 3348B2RF	4.4	35.0	80.3	28.6	9.9	3.7	75.8	8.7	3.0	1.0
PhytoGen 375WRF	4.5	34.1	80.6	27.8	10.0	1.7	77.4	8.5	3.0	1.0
PhytoGen 485WRF	4.5	34.7	81.5	29.9	11.7	2.3	75.6	9.1	3.0	1.3
Stoneville 4498B2RF	4.4	35.2	81.8	30.9	11.4	3.3	76.8	8.8	3.0	1.0
Stoneville 5458B2RF	4.8	33.6	78.7	28.3	9.9	2.0	75.2	9.3	3.0	1.3
Test average	4.4	34.9	80.4	28.8	10.3	2.3	77.2	8.6	2.9	1.1
CV, %	3.4	1.1	0.8	1.8	2.9	34.9	1.0	3.1	--	--
OSL	0.0002	<0.0001	0.0012	<0.0001	<0.0001	0.0177	<0.0001	0.0002	--	--
LSD	0.3	0.6	1.1	0.9	0.5	1.4	1.3	0.5	--	--

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

AgriLIFE EXTENSION
Texas A&M System

Replicated Irrigated Roundup Ready Flex Cotton Seeding Rate Demonstration, Sunray, TX – 2008

Cooperator: Kerry Cartrite

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

Sherman County

Summary: Targeted seeding rates of 40,000, 60,000 and 80,000 seed/acre had no effect on cotton yield or fiber quality.

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

Materials and Methods:

Variety:	FiberMax 9058F
Experimental design:	Randomized complete block with 3 replications
Seeding rate:	3 treatments - 30-inch row spacing Trt 1 – 40,209 Trt 2 – 60,636 Trt 3 – 81,602
Plot Size:	12 rows approximately 600 ft in length within a pivot sprinkler irrigation system
Planting date:	6-May
Weed Management:	Roundup WeatherMax (32 oz/acre) + Dual (1 pt/acre) applied preemergence. Two additional applications of Roundup WeatherMax at 32 oz/acre were applied over-the-top during the season.

Rainfall and Irrigation:	Seven inches of irrigation water applied preplant and 5 inches applied during the growing season. Rainfall totaled 13.92 inches of rain during the growing season (1-May through 26-November) as recorded by the Texas AgriLife Research weather station near Etter.
Insecticides:	Temik at 3 lb/acre was applied in-furrow at planting, Orethene at 4 oz/acre twice during the season.
Fertilizer management:	100 lbs/acre 11-52-0 was applied in the spring prior to planting. In addition, 10 gal/acre 32-0-0 was applied through the pivot during the growing season.
Plant growth regulators:	None applied
Harvest aids:	Bollbuster (ethephon) was used prior to harvest
Harvest:	Plots were harvested on 1-December using a commercial John Deere 7460 stripper with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine plot weights. Plot yields were converted to lb/acre.
Gin turnout:	Samples from each plot were ginned at the Texas AgriLife Research and Extension Center near Lubbock to determine gin turnouts.
Fiber analysis:	Lint samples were submitted to the International Textile Center at Texas Tech University Fiber and Biopolymer Research Institute for HVI analysis, and Commodity Credit Corporation (CCC) loan values were determined for each treatment by plot.

Results and Discussion:

Actual plant populations were 24,693, 35,964 and 46,777 plants per acre (Table 1). Plant population did not affect any of the fiber quality components (data not shown except for micronaire) or yield. Net value (lint and seed value minus ginning and seed and technology fee costs) ranged from $430 to $477, but seeding rates were not statistically different. Low heat unit accumulation during the summer and a relatively early freeze resulted in a lack of cotton maturity at harvest. This lack of maturity likely resulted in greater variability in the data than what we would normally expect (high % CV).

Acknowledgments:

Appreciation is expressed to Kerry Cartrite for the use of his land, equipment and labor for this project. Further assistance with this project was provided by Dr. Eric Hequet - Associate Director, Texas Tech University Fiber and Biopolymer Research Institute.

Disclaimer Clause:

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Table 1. Harvest, loan, and net value calculated from HVI property results from the replicated irrigated cotton seeding rate demonstration, Kerry Cartrite Farm, Sunray, TX 2008.

Seeding rate	Final stand*	Lint turnout	Lint yield	Seed yield	Micronaire	Lint loan value	Total value	Ginning cost	Seed/tech. cost	Net value
	plants/acre	%	---------lb/acre---------		units	$/lb	----------$/acre----------			
40,209	24,693 a	25	974	1,856	2.3	0.4390	613.43	114.71	41.82	456.89
60,636	35,964 b	27	1,055	1,996	2.3	0.4379	663.05	123.20	63.06	476.78
81,602	46,772 c	26	976	1,861	2.3	0.4516	626.49	114.28	82.30	429.92
Test Avg.	35,810	26	1,002	1,905	2.3	0.4428	634.32	117.40	62.39	454.53
CV	11.2	4	10	11.1	2.0	2.9	11.8	10.0	--	14.0
OSL	0.0007	0.7915	0.5360	0.4969	0.9970	0.3107	0.6469	0.5206	--	0.6083

*Means followed by different letters are significantly different at P=0.05.
OSL - observed significance level, or probability of a greater F value.
Note: some columns may not add up due to rounding error.

Assumes:
$3.00/cwt ginning cost.
$200/ton for seed.
Value for lint base on CCC loan value from grab samples and FBRI HVI results.

AgriLIFE EXTENSION
Texas A&M System

Replicated Irrigated Roundup Ready Flex Cotton Seeding Rate Demonstration, Sunray, TX – 2008

Cooperator: Tom Moore

Marcel Fischbacher, Brent Bean, Randy Boman, Mark Kelley, Rex Brandon, Bob Villareal, and Jake Robinson
CEA-ANR Ochiltree County, Extension Agronomist - Amarillo, Extension Agronomist-Cotton - Lubbock, Extension Program Specialist II - Cotton, AgriLife Research Assistant, AgriLife Research Assistant, and AgriLife Research Assistant

Sherman County

Summary: Targeted seeding rates of 100,000, 80,000 and 60,000 seed/acre had no affect on cotton yield or fiber quality.

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

Materials and Methods:

Variety: FiberMax 9058F

Experimental design: Randomized complete block with 4 replications

Seeding rate: 3 treatments - 20-inch row spacing
Trt 1 – 100,000
Trt 2 – 80,000
Trt 3 – 60,000

Plot size: 16 rows approximately 554 ft in length under a pivot sprinkler irrigation system.

Planting date: 6-May

Rainfall: 13.92 inches of rain accumulation throughout 1-May to 26-November

Irrigation: Limited irrigated with center pivot.

Insecticides: N/A

Fertilizer management: N/A

Plant growth regulators: N/A

Harvest aids: N/A

Harvest: Plots were harvested on 26-November using a commercial John Deere 7460 stripper equipped with a 20-inch row header. Harvested material was transferred to a weigh wagon with integral electronic scales to determine plot weights. Plot yields were recorded and converted to lb/acre.

Gin turnout: Samples from each plot were ginned at the Texas AgriLife Research and Extension Center near Lubbock to determine gin turnouts.

Fiber analysis: Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis, and Commodity Credit Corporation (CCC) loan values are being determined for each seeding rate by plot.

Results and Discussion:

Variability in plant population was high in each seeding rate treatment. This was primarily due to planting in an abundance of corn residue. Actual plant population of each seeding rate treatment was determined by counting plants in 10-ft of row from 16 random spots in each plot. Seeding rates of 60,000, 80,000, and 100,000 did not significantly affect lint yield or net value of the cotton (Table 1). Average lint yield was 831 lb/acre, and was achieved with 13.92 inches of rainfall plus irrigation. Lint turnout averaged 27%. Seed turnout averaged 50% and seed yield averaged 1,532 lb/ac. Plant population did not affect any of the fiber quality components (data not shown except for micronaire). Net value (lint and seed value minus ginning, seed and technology fee costs) ranged from $341 to $366. Low heat unit accumulation during the summer and a relatively early freeze resulted in a lack of cotton maturity at harvest. This lack of maturity likely resulted in greater variability in the data than what would normally be expected.

Acknowledgments:

Appreciation is expressed to Tom Moore for the use of his land, equipment and labor for this project. Further assistance with this project was provided by Dr. John Gannaway – Texas AgriLife Research and Extension Center (Retired), 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:

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Table 1. Harvest, loan, and net value calculated from HVI property results from the replicated irrigated Roundup Reach Flex cotton seeding rate demonstration, Tom Moore Farm, Sunray, TX 2008.

Seeding rate	Final stand*	Lint turnout	Lint yield	Seed yield	Micronaire	Lint loan value	Total value	Ginning cost	Seed/tech. cost	Net value
seed/acre	plants/acre	%	---------lb/acre---------		units	$/lb	----------$/acre----------			
100,000	60,359	27	852	1,598	2.63	0.4600	550.18	96.35	104.00	349.86
80,000	53,105	27	840	1,543	2.63	0.4595	540.22	93.82	80.20	366.20
60,000	43,358	27	800	1,454	2.58	0.4350	493.59	89.92	62.40	341.28
Test Avg.	52,274	27	831	1,532	2.61	0.4515	528.00	93.36	82.20	352.45
CV	34.59	1.65	5.02	5.86	5.3	2.74	5.85	4.5	--	7.8
OSL	0.6331	0.6699	0.2741	0.1688	0.8425	0.0469	0.0984	0.1939	--	0.4806

OSL - observed significance level, or probability of a greater F value.
Note: some columns may not add up due to rounding error.

Assumes:
$3.00/cwt ginning cost.
$200/ton for seed.
Value for lint base on CCC loan value from grab samples and FBRI HVI results.

Common Variety Comparisons Across Locations

4 Varieties common to 5 Locations				
Rank by Lint yield =>	1	2	3	4
Rank by Loan =>	3	4	2	1
Rank by Net value =>	1	2	3	4
Variety =>	PHY 375WRF	DG 2570B2RF	NG 3348B2RF	AT Apex B2RF
Location	Ranking by Net value by location			
Crosby County	2	1	3	4
Floyd County	2	3	1	4
Hale County	1	2	4	3
Hockley County	1	3	2	4
Dawson County	3	1	4	2
Lint yld avg	1377	1358	1243	1207
Loan avg	0.5080	0.5040	0.5122	0.5160
Net value avg	712.62	711.07	657.71	648.20

6 Varieties common to 5 Locations						
Rank by Lint yield =>	1	3	4	2	6	5
Rank by Loan =>	5	1	3	6	4	2
Rank by Net value =>	1	2	3	4	5	6
Variety =>	PHY 375WRF	FM 9180B2F	NG 3348B2RF	ST 4498B2RF	AFD 5065B2F	AT Apex B2RF
Location	Ranking by Net value by location					
Briscoe County	1	3	2	4	6	5
Crosby County	1	3	4	2	6	5
Floyd County	3	1	2	5	4	6
Hale County	1	4	5	2	6	3
Blanco Systems	1	5	4	3	6	2
Lint yld avg	1253	1134	1123	1144	1031	1051
Loan avg	0.5036	0.5251	0.5140	0.4974	0.5124	0.5160
Net value avg	635.34	607.23	584.70	571.07	554.94	552.50

Additional Replicated Dryland Large Plot Demonstrations

AgriLIFE EXTENSION
Texas A&M System

Replicated Dryland Cotton Variety Demonstration, AG-CARES, Lamesa, TX - 2008

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: Significant differences were observed for all plant population and plant measurements reported (Table 1), and for most yield and HVI fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from 23.9% for NexGen 3410RF to 28.0% for PhytoGen 375WRF. Lint yields varied from a low of 449 lb/acre (AFD 5064F) to a high of 589 lb/acre (PhytoGen 375WRF). Lint loan values ranged from a low of $0.5282/lb to a high of $0.5743/lb for AFD 5064F and FiberMax 1880B2F, respectively. After subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $288.92 (PhytoGen 375WRF) to a low of $208.32 (AFD 5064F), a difference of $80.60. Micronaire values ranged from a low of 3.7 for NexGen 3410RF to a high of 4.5 for PhytoGen 375WRF. Staple length averaged 37.1 across all varieties with a low of 35.7 (AFD 5064F) and a high of 38.6 (FiberMax 1880B2F). Percent uniformity ranged from a low of 81.2 (Stoneville 5458B2RF) to a high of 82.6 (FiberMax 1880B2F), and strength ranged from a low of 29.3 g/tex for All-Tex Apex B2RF and Deltapine 174RF to a high of 32.5 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 production in the Texas High Plains.

Materials and Methods:

Varieties: AFD 5064F, All-Tex Apex B2RF, Croplan Genetics 3020B2RF, Deltapine 174RF, FiberMax 1880B2F, NexGen 3410RF, PhytoGen 375WRF, and Stoneville 5458B2RF

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 length of field (~850 ft)

Planting date: 2-June

Weed management: Trifluralin was applied preplant incorporated at 1 pt/acre on 10-April. Glyphosate was applied over-the-top in July at 32 oz/acre with 3.2 oz/acre Level 7 (AMS).

Rainfall:

April:	2.11"	August:	0.39"
May:	2.85"	September:	5.25"
June:	1.05"	October:	2.41"
July:	0.13"		

Total rainfall: 14.19"

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 32 oz/acre Gramoxone Inteon with 0.25% v/v NIS on 13-November.

Harvest: Plots were harvested on 25-November using a commercial John Deere 7445 with field cleaner by-passed. 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 $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/seedindex.html

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. Later in September, substantial rainfall was obtained which resulted in some regrowth. Cool conditions in September and October caused some later set fruit to have lower micronaire, which resulted in highly variable micronaire readings in the trial.

Significant differences were observed for all plant population and plant measurement parameters reported (Table 1.) On 25-June, the test average plant population was 43,342 plants/acre with a high of 48,700 for All-Tex Apex B2RF and a low of 36,590 for Croplan Genetics 3020B2RF. Plant measurement numbers reported represent an average of 10 plants per plot or 30 plants per variety from the 7-August plant map event. Plant height ranged from a high of 15.7" for FiberMax 1880B2F to a low of 12.2" for AFD 5064F. Total mainstem node numbers averaged 13.4 across all varieties, resulting in a test average height to node ratio of 1.0. AFD 5064F had the lowest node of first fruiting branch with 6.2 and FiberMax 1880B2F had the highest with 8.4. Total fruiting nodes averaged 7.7 across all varieties and ranged from a low of 7.3 (FiberMax 1880B2F and Stoneville 5458B2RF) to a high of 8.2 (PhytoGen 375WRF).

Significant differences were noted for most yield and HVI fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from 23.9% for NexGen 3410RF to 28.0% for PhytoGen 375WRF. Bur cotton yield averaged 1999 lb/acre across all varieties and ranged from 1740 lb/acre to 2228 lb/acre for AFD 5064F and Stoneville 5458B2RF, respectively. Lint yields varied from a low of 449 lb/acre (AFD 5064F) to a high of 589 lb/acre (PhytoGen 375WRF). Lint loan values ranged from a low of $0.5282/lb to a high of $0.5743/lb for AFD 5064F and FiberMax 1880B2F, respectively. After adding lint and seed value, total value/acre ranged from a low of $308.35 for AFD 5064F, to a high of $414.82 for Stoneville 5458B2RF. When subtracting ginning, seed and technology fee costs, the net value/acre among varieties ranged from a high of $288.92 (PhytoGen 375WRF) to a low of $208.32 (AFD 5064F), a difference of $80.60.

Micronaire values ranged from a low of 3.7 for NexGen 3410RF to a high of 4.5 for PhytoGen 375WRF. Staple length averaged 37.1 across all varieties with a low of 35.7 (AFD 5064F) and a high of 38.6 (FiberMax 1880B2F). Percent uniformity

ranged from a low of 81.2% (Stoneville 5458B2RF) to a high of 82.6% (FiberMax 1880B2F), and strength ranged from a low of 29.3 g/tex for All-Tex Apex B2RF and Deltapine 174RF to a high of 32.5 g/tex for NexGen 3410RF. Elongation ranged from a high of 11.1% for Croplan Genetics 3020B2RF to a low of 9.8% for NexGen 3410RF. Leaf grades were mostly 2s and 3s at this location. Values for reflectance (Rd) and yellowness (+b) averaged 80.2 and 7.6, respectively. This resulted in color grades of mostly 21s and 31s 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 Danny Carmichael for his cooperation and assistance with this demonstration. Further assistance with this project was provided by Dr. John Gannaway - Texas AgriLife Research and Extension Center (Retired), 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:

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Table 1. Stand count and in season plant map results from the replicated dryland cotton variety demonstration, AGCARES Farm, Lamesa, TX, 2008.

Variety	25-Jun		7-Aug						
	Plant stand		Plant height	Total mainstem	Height/node	Node of first	Total fruiting	Node of first	Nodes above first
	#/row ft	#/acre	inches	nodes	ratio	fruiting branch	nodes	position white flower	position white flower
AFD 5064F	2.9	38,333 bc	12.2 d	12.8 c	0.96 c	6.2 c	7.6 c	9.2 c	3.6 bc
All-Tex Apex B2RF	3.7	48,700 a	13.2 bcd	13.4 bc	0.99 bc	6.7 bc	7.7 abc	9.7 bc	3.7 bc
Croplan Genetics 3020B2RF	2.8	36,590 c	12.6 bcd	13.1 bc	0.96 c	6.5 bc	7.6 bc	9.3 c	3.8 bc
Deltapine 174RF	3.3	43,299 ab	13.7 bc	13.2 bc	1.04 bc	6.8 b	7.4 c	9.3 c	4.0 ab
FiberMax 1880B2F	3.7	48,439 a	15.7 a	14.7 a	1.07 ab	8.4 a	7.3 c	11.5 a	3.2 c
NexGen 3410RF	3.3	43,909 ab	15.4 a	13.4 bc	1.15 a	6.4 bc	8.1 ab	10.1 b	3.4 bc
PhytoGen 375WRF	3.4	44,344 ab	13.9 b	13.7 b	1.02 bc	6.5 bc	8.2 a	9.2 c	4.5 a
Stoneville 5458B2RF	3.3	43,124 ab	12.4 cd	13.0 bc	0.95 c	6.7 bc	7.3 c	9.5 bc	3.5 bc
Test average	3.3	43,342	13.7	13.4	1.0	6.8	7.7	9.7	3.7
CV, %	10.4	10.3	6.2	3.1	6.1	4.8	4.3	4.3	9.9
OSL	0.0514†	0.0507†	0.0007	0.0021	0.0197	<0.0001	0.0502†	0.0001	0.0211
LSD 0.05	0.5	6,389	1.5	0.7	0.11	0.6	0.5	0.7	0.6

Means within a column with the same letter are not significantly different.
Plant map 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.

Table 2. Harvest results from the replicated dryland cotton variety demonstration, AGCARES Farm, Lamesa, TX, 2008.

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 ----------						
PhytoGen 375WRF	28.0	36.6	2105	589	770	0.5707	336.27	76.96	413.23	63.15	61.16	288.92	a
Stoneville 5458B2RF	25.5	42.1	2228	569	938	0.5635	321.04	93.77	414.82	66.84	62.93	285.04	a
FiberMax 1880B2F	27.4	47.0	1921	526	903	0.5743	302.21	90.30	392.50	57.63	63.48	271.39	a
Deltapine 174RF	26.0	37.9	2075	541	786	0.5565	300.60	78.63	379.23	62.24	52.72	264.27	a
All-Tex Apex B2RF	26.1	42.2	1932	504	815	0.5702	287.57	81.45	369.01	57.96	57.38	253.68	a
NexGen 3410RF	23.9	42.6	1968	470	839	0.5608	264.13	83.87	348.00	59.03	42.75	246.23	ab
Croplan Genetics 3020B2RF	24.6	42.9	2021	497	867	0.5695	282.71	86.69	369.40	60.62	62.79	245.98	ab
AFD 5064F	25.8	41.3	1740	449	718	0.5282	236.53	71.82	308.35	52.20	47.83	208.32	b
Test average	25.9	41.6	1999	518	830	0.5617	291.38	82.94	374.32	59.96	56.38	257.98	
CV, %	9.6	7.1	8.2	8.0	8.3	3.0	8.2	8.4	8.2	8.2	--	10.0	
OSL	0.5532	0.0203	0.0784†	0.0143	0.0280	0.0789†	0.0043	0.0282	0.0136	0.0785†	--	0.0377	
LSD	NS	5.1	235	73	121	0.0238	41.80	12.14	53.43	7.04	--	45.19	

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

Assumes:
$3.00/cwt ginning cost.
$200/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 cotton variety demonstration, AGCARES Farm, Lamesa, TX, 2008.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
AFD 5064F	3.8	35.7	81.3	31.2	10.6	3.3	78.7	7.9	3.0	1.0
All-Tex Apex B2RF	4.3	37.6	82.3	29.3	10.7	2.0	80.8	7.2	3.0	1.0
Croplan Genetics 3020B2RF	3.9	36.0	82.4	29.4	11.1	2.3	81.6	7.4	2.7	1.0
Deltapine 174RF	4.0	37.4	81.7	29.3	10.7	2.3	80.8	7.3	2.7	1.0
FiberMax 1880B2F	4.4	38.6	82.6	32.0	9.9	1.3	81.2	6.8	3.0	1.0
NexGen 3410RF	3.7	38.2	81.8	32.5	9.8	3.0	79.0	7.8	3.0	1.0
PhytoGen 375WRF	4.5	36.9	82.4	30.1	10.3	1.7	80.7	7.6	3.0	1.0
Stoneville 5458B2RF	4.1	36.8	81.2	32.4	10.2	2.7	78.8	8.5	2.3	1.0
Test average	4.1	37.1	81.9	30.8	10.4	2.3	80.2	7.6	2.8	1.0
CV, %	9.1	1.3	0.7	3.3	2.2	30.1	1.1	4.5	--	--
OSL	0.1447	<0.0001	0.0648†	0.0026	0.0001	0.0540†	0.0030	0.0014	--	--
LSD	NS	0.8	0.8	1.8	0.4	1.0	1.5	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, †denotes significance at the 0.10 level, NS - not significant.

AgriLIFE EXTENSION
Texas A&M System

Replicated Dryland 2X1 Skip-Row Cotton Variety Demonstration, Littlefield, TX - 2008

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 is reported on a per land acre basis. No significant differences were observed for plant population on 25-June, and only some of the plant measurement parameters taken on 7-August were significantly different (Table 1.) Significant differences were noted for most yield and HVI fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from 27.4% for NexGen 3410RF to 32.2% for Croplan Genetics 3035RF. Lint yields varied from a low of 506 lb/land acre (NexGen 3410RF) to a high of 655 lb/land acre (Stoneville 4664RF). Lint loan values ranged from a low of $0.5052/lb to a high of $0.5528/lb for NexGen 3410RF and AFD 5064F, respectively. After subtracting ginning, seed and technology fee costs, the net value/land acre among varieties ranged from a high of $356.22 for Stoneville 4664RF to a low of $265.13 for NexGen 3410RF, a difference of $91.09. Micronaire values ranged from a low of 3.0 for Deltapine 174RF and NexGen 3410RF to a high of 3.9 for AFD 5064F. Staple length averaged 36.2 across all varieties with a low of 34.9 (Stoneville 4664RF) and a high of 38.4 (FiberMax 9058F). Percent uniformity ranged from a low of 80.2% for Deltapine 174RF to a high of 82.1% for AFD 5064F, and strength ranged from a low of 27.5 g/tex for PhytoGen 315RF to a high of 29.8 g/tex for FiberMax 9058F. 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: AFD 5064F, All-Tex Epic RF, Croplan Genetics 3035RF, Deltapine 174RF, FiberMax 9058F, NexGen 3410RF, PhytoGen 315RF, and Stoneville 4664RF

Experimental design: Randomized complete block with 3 replications

Seeding rate: 3.3 seeds/row-ft in 2X1 skip-row planted 40-inch row spacing (John Deere 7300 MaxEmerge vacuum planter)

Plot size: 8 rows (6 planted) by length of field (2515 ft)

Planting date: 22-May

Weed management: Trifluralin was applied preplant incorporated at 1.3 pt/acre in early March. Roundup WeatherMax was applied over-the-top on 15-June and 5-August at 24 oz/acre with ammonium sulfate and LI 700.

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

April:	1.59"	July:	3.6"
May:	4.27"	August:	2.69"
June:	1.64"	September:	4.05"

Total rainfall: 17.84"

The producer reported only 5.6 inches of rainfall accumulation from planting to end of August. This does not include rainfall amounts prior to planting in April and May or September rainfall.

Insecticides: Temik was applied infurrow at planting at 2.5 lbs/planted acre. 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 4-December 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 $200/ton. Ginning costs did not include checkoff.

Seed and technology fees: Seed and technology costs were calculated on a land acre basis using the appropriate seeding rate (3.3 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/seedindex.html

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 per land acre basis**. No significant differences were observed for plant population on 25-June, and only some of the plant measurement parameters taken on 7-August were significantly different (Table 1.) The test average plant population was 14,557 plants/acre with a high of 17,076 plants/acre for Croplan Genetics 3035RF and a low of 11,442 plants/acre for PhytoGen 315RF. Plant measurement numbers reported represent an average of 10 plants per plot or 30 plants per variety from the 7-August plant map event. Plant height ranged from a high of 16.5" for Deltapine 174RF to a low of 14.2" for FiberMax 9058F. Total mainstem node numbers averaged 15.3 across all varieties, resulting in a test average height to node ratio of 1.0. Stoneville 4664RF had the lowest node of first fruiting branch with 6.2 and FiberMax 9058F had the highest with 7.9. Total fruiting node numbers averaged 9.3 across all varieties and ranged from a low of 8.6 (FiberMax 9058F) to a high of 9.7 (PhytoGen 315RF).

Significant differences were noted for most yield and HVI fiber quality parameters measured (Tables 2 and 3). Lint turnout ranged from 27.4% for NexGen 3410RF to 32.2% for Croplan Genetics 3035RF. Bur cotton yield averaged 1888 lb/land acre across all varieties and ranged from 1783 lb/land acre for Croplan Genetics 3035RF to 2132 lb/land acre for Stoneville 4664RF. Lint yields varied from a low of 506 lb/land acre (NexGen 3410RF) to a high of 655 lb/land acre (Stoneville 4664RF). Lint loan values ranged from a low of $0.5052/lb to a high of $0.5528/lb for NexGen 3410RF and AFD 5064F, respectively. After adding lint and seed value, total value/land acre ranged from a low of $343.57 for NexGen 3410RF, to a high of $449.36 for Stoneville 4664RF. When subtracting ginning, seed and technology fee costs, the net value/land acre among varieties ranged from a high of $356.22 (Stoneville 4664RF) to a low of $265.13 (NexGen 3410RF), a difference of $91.09.

Micronaire values ranged from a low of 3.0 for Deltapine 174RF and NexGen 3410RF to a high of 3.9 for AFD 5064F. Staple length averaged 36.2 across all varieties with a low of 34.9 (Stoneville 4664RF) and a high of 38.4 (FiberMax 9058F). Percent uniformity ranged from a low of 80.2% for Deltapine 174RF to a

high of 82.1% for AFD 5064F, and strength ranged from a low of 27.5 g/tex for PhytoGen 315RF to a high of 29.8 g/tex for FiberMax 9058F. Elongation ranged from a high of 11.7% for Stoneville 4664RF to a low of 8.8% for FiberMax 9058F. Leaf grades were mostly 2s and 3s at this location. Values for reflectance (Rd) and yellowness (+b) averaged 79.3 and 8.7, respectively. This resulted in color grades of mostly 21s 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. John Gannaway - Texas AgriLife Research and Extension Center (Retired), 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. Stand count and in season plant map results from the replicated dryland 2X1 skip-row cotton variety demonstration, Greg White Farm, Littlefield, TX, 2008.

Variety	25-Jun		7-Aug						
	Plant stand		Plant height	Total mainstem	Height/node	Node of first	Total fruiting	Node of first	Nodes above first
	#/row ft	#/acre	inches	nodes	ratio	fruiting branch	nodes	position white flower	position white flower
AFD 5064F	1.9	16,263	16.2	15.0 bc	1.08	6.7 cd	9.3 ab	10.5 ab	4.5
All-Tex Epic RF*	1.8	15,450	15.5	15.9 a	0.97	7.5 ab	9.4 ab	10.6 ab	5.3
Croplan Genetics 3035RF	1.9	17,076	16.1	15.5 ab	1.04	7.0 bc	9.5 a	9.8 bc	5.7
Deltapine 174RF	1.7	14,985	16.5	15.5 ab	1.06	7.0 bc	9.5 a	10.4 ab	5.1
FiberMax 9058F	1.5	12,952	14.2	15.5 ab	0.92	7.9 a	8.6 c	10.9 a	4.6
NexGen 3410RF	1.7	14,521	15.8	14.5 c	1.09	6.6 cd	8.9 bc	9.1 c	5.4
PhytoGen 315RF	1.3	11,442	16.1	15.4 ab	1.04	6.8 cd	9.7 a	10.5 ab	4.9
Stoneville 4664RF	1.6	13,766	14.8	14.6 c	1.01	6.2 d	9.4 a	8.8 c	5.8
Test average	1.7	14,557	15.7	15.3	1.0	7.0	9.3	10.1	5.2
CV, %	15.8	16.5	7.4	2.5	8.5	5.6	4.1	5.9	11.4
OSL	0.1635	0.1822	0.3006	0.0054	0.3227	0.0033	0.0565†	0.0057	0.1241
LSD 0.05	NS	NS	NS	0.7	NS	0.7	0.5	1.0	NS

Means within a column with the same letter are not significantly different.
Plant map 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.

*All-Tex Epic RF tested as All-Tex 65333RF

Table 2. Harvest results from the replicated dryland 2X1 skip-row cotton variety demonstration, Greg White Farm, Littlefield, TX, 2008.

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 ----------						
Stoneville 4664RF	30.7	46.0	2132	655	980	0.5332	351.40	97.97	449.36	63.97	29.16	356.22	a
All-Tex Epic RF*	32.0	46.5	1873	601	871	0.5432	326.09	87.14	413.22	56.18	23.32	333.72	ab
FiberMax 9058F	29.8	46.4	1939	578	901	0.5315	307.04	90.09	397.13	58.18	29.47	309.48	abc
AFD 5064F	29.2	48.8	1858	543	907	0.5528	300.23	90.72	390.96	55.75	25.93	309.28	abc
Croplan Genetics 3035RF	32.2	46.2	1783	574	824	0.5297	304.84	82.45	387.29	53.49	29.09	304.71	bc
PhytoGen 315RF	30.9	45.6	1830	566	833	0.5148	291.86	83.32	375.18	54.90	28.47	291.81	bc
Deltapine 174RF	28.9	44.8	1846	533	828	0.5110	272.31	82.78	355.10	55.39	28.58	271.13	c
NexGen 3410RF	27.4	47.7	1842	506	879	0.5052	255.73	87.85	343.57	55.27	23.17	265.13	c
Test average	30.1	46.5	1888	570	878	0.5277	301.19	87.79	388.98	56.64	27.15	305.19	
CV, %	4.1	2.4	5.8	5.9	5.7	5.1	9.2	5.7	8.2	5.8	--	9.5	
OSL	0.0043	0.0197	0.0399	0.0036	0.0273	0.4147	0.0230	0.0276	0.0289	0.0395	--	0.0292	
LSD	2.2	2.0	190	59	87	NS	48.44	8.75	55.86	5.71	--	50.96	

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.
$200/ton for seed.
Value for lint based on CCC loan value from grab samples and FBRI HVI results.

*All-Tex Epic RF tested as All-Tex 65333RF

Table 3. HVI fiber property results from the replicated dryland 2X1 skip-row cotton variety demonstration, Greg White Farm, Littlefield, TX, 2008.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
AFD 5064F	3.9	35.4	82.1	29.3	10.4	3.3	77.4	8.4	3.0	1.0
All-Tex Epic RF*	3.3	35.8	81.4	28.1	11.0	1.0	79.5	9.3	2.0	1.0
Croplan Genetics 3035RF	3.2	35.8	81.6	27.8	11.2	1.3	80.6	8.9	1.3	1.0
Deltapine 174RF	3.0	36.5	80.2	27.7	10.5	2.7	79.5	8.5	2.0	1.0
FiberMax 9058F	3.3	38.4	81.2	29.8	8.8	3.0	80.5	8.0	2.0	1.0
NexGen 3410RF	3.0	37.7	81.4	29.1	9.7	3.0	78.8	8.6	2.3	1.0
PhytoGen 315RF	3.1	35.4	81.0	27.5	9.8	2.7	79.5	8.5	2.0	1.0
Stoneville 4664RF	3.3	34.9	80.7	28.7	11.7	2.3	78.6	9.1	2.0	1.0
Test average	3.3	36.2	81.2	28.5	10.4	2.4	79.3	8.7	2.1	1.0
CV, %	8.6	0.7	0.5	1.6	2.3	32.7	1.0	4.6	--	--
OSL	0.0292	<0.0001	0.0043	<0.0001	<0.0001	0.0268	0.0032	0.0264	--	--
LSD	0.5	0.5	0.8	0.8	0.4	1.4	1.3	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, NS - not significant.

*All-Tex Epic RF tested as All-Tex 65333RF

Replicated Dryland Roundup Ready Flex Cotton Variety Demonstration, Perryton, TX – 2008

Cooperator: Roger Davis

Scott Strawn, Brent Bean, Randy Boman, Mark Kelley, Rex Brandon, Bob Villareal, and Jake Robinson
CEA-ANR Ochiltree County, Extension Agronomist - Amarillo, Extension Agronomist-Cotton - Lubbock, Extension Program Specialist II - Cotton, AgriLife Research Assistant, AgriLife Research Assistant, and AgriLife Research Assistant

Ochiltree County

Summary: Variability was high because of non-uniform stand emergence due to planting in heavy wheat residue. Percent lint turnout was good averaging 31.7%. Average lint yield was 819 lb/acre with yields ranging from a low of 613 lb/acre for AFD 5064F to a high of 1,016 lb/acre for NexGen 1572RF. Seed yield averaged 1,363 lb/acre. Net value (lint and seed value minus ginning and seed and technology fee costs) ranged from $251.08/acre to $470.53/acre among varieties. Highest net values were obtained with NexGen 1572RF, All-Tex Epic RF, FiberMax 9058F, PhytoGen 315RF and FiberMax 9060F.

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

Materials and Methods:

Varieties: AFD 5064F, All-Tex Epic RF (tested as All-Tex 65333RF), Croplan Genetics 3035RF, Deltapine 121RF, Dyna-Gro 2400RF, FiberMax 9058F, FiberMax 9060F, NexGen 1572RF, NexGen 3550RF, PhytoGen 315RF

Experimental design: Randomized complete block with 3 replications

Seeding rate: 30-inch row spacing at 32,000 seed/acre

Plot Size: 6 rows by approximately 586 ft in length

Planting date: 14-May

Rainfall:	5 inches of rain accumulation from 1-May to 26-November
Herbicides:	Diuron, 32 oz/acre pre-emergence, plus 3 broadcast treatments - Roundup PowerMax 22 oz/acre
Insecticides:	Acephate 90 WP, 3 applications at 4 oz/acre
Fertilizer management:	10 gal/acre 32-0-0 at planting (sidedress)
Plant Growth Regulators:	None
Seed Treatment:	None
Harvest aids:	Ethephon 2 pt/acre with crop oil concentrate
Harvest:	Plots were harvested on 7-January using a commercial John Deere 7460 with field cleaner. Harvested material was transferred to a weigh wagon with integral electronic scales to determine plot weights. Plot weights were converted to lb/acre basis.
Gin turnout:	Samples from each plot were ginned at the Texas AgriLife Research and Extension Center near Lubbock to determine gin turnouts.
Fiber analysis:	Lint samples were submitted to the Fiber and Biopolymer Research Institute at Texas Tech University for HVI analysis and Commodity Credit Corporation (CCC) loan values were determined for each variety by plot.

Results and Discussion:

Variability was high because of non-uniform stand emergence due to planting in heavy wheat residue (Table 1). Soil moisture was excellent at planting. Average lint yield was 819 lb/acre with yields ranging from a low of 613 lb/acre for AFD 5064F to a high of 1,016 lb/acre for NexGen 1572RF. Seed yield averaged 1,363 lb/acre. Lint loan value ranged from $0.38 to $0.44. Net value (lint plus seed value minus ginning, seed costs, and technology fees) ranged from a low of $251.08 for AFD 5064F to a high of $470.53 for NexGen 1572RF. Other varieties included in the upper tier for net value were All-Tex Epic RF ($460.70), FiberMax 9058F ($417.84), PhytoGen 315RF ($402.90) and FiberMax 9060F ($386.10).

Differences in fiber properties influenced the loan value obtained for each variety (Table 2). Micronaire was similar for most varieties at approximately 2.6, with the exception of All-Tex Epic RF at 2.9. Staple averaged 35.5 across all varieties, with FiberMax 9060F and FiberMax 9058F resulting in 37.0 and 36.8 32nd inches, respectively. Fiber yellowness (+b) and color also affected loan value. Because of considerable variability in grab samples, leaf grades for all varieties were set at 5.0.

Acknowledgments:

Appreciation is expressed to Roger Davis for the use of his land, equipment and labor for this project. Further assistance with this project was provided by Dr. John Gannaway – Texas AgriLife Research and Extension Center (Retired), 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 Roundup Ready Flex cotton variety demonstration, Roger Davis Farm, Perryton, TX, 2008.

Variety	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Seed/tech. cost	Net value
	-------%-------		----------lb/acre----------			$/lb	----------$/acre----------					
NexGen 1572RF	29.8	52.9	3,415	1,016	1,797	0.4107	417.76	179.74	597.50	102.45	24.53	470.53 a
All-Tex Epic RF*	30.0	51.7	3,194	958	1,654	0.4367	418.53	165.43	583.96	95.82	27.45	460.70 a
FiberMax 9058F	30.1	51.4	2,881	886	1,481	0.4368	387.32	148.15	535.47	86.42	31.20	417.84 ab
PhytoGen 315RF	31.6	49.9	2,763	887	1,362	0.4302	379.72	136.22	515.93	82.89	30.14	402.90 abc
FiberMax 9060F	39.8	51.3	2,842	847	1,464	0.4189	356.14	146.43	502.57	85.27	31.20	386.10 abcd
Deltapine 121RF	31.3	49.6	2,376	741	1,176	0.4223	313.41	117.64	431.05	71.29	30.26	329.50 bcde
NexGen 3550RF	30.1	51.9	2,489	749	1,288	0.3975	295.25	128.83	424.08	74.68	24.53	324.88 bcde
Croplan Genetics 3035RF	31.0	50.6	2,458	768	1,246	0.3778	294.05	124.56	418.61	73.75	36.04	308.82 cde
Dyna-Gro 2400RF	31.7	51.7	2,302	727	1,187	0.3838	277.76	118.74	396.50	69.06	30.67	296.77 de
AFD 5064F	31.9	51.1	1,913	613	977	0.3868	235.43	97.74	333.17	57.39	24.70	251.08 e
Test Avg.	31.7	51.2	2,663	819	1,363	0.4102	337.54	136.35	473.88	79.9	29.07	364.91
CV	6.44	3.63	13.52	13.66	13.67	6.13	15.52	13.67	14.38	13.52	--	16.17
OSL	0.8451	0.6695	0.0048	0.0152	0.0028	0.0642	0.0060	0.0028	0.0038	0.0048	--	0.0044
LSD (P=.05)	NS	NS	627	195	324	NS	91.14	32.43	118.56	18.8	--	102.64

For net value/acre, means followed by same letter do not significantly differ at the 0.05 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.

Assumes:
$3.00/cwt ginning cost.
$200/ton for seed.
Value for lint base on CCC loan value from grab samples and FBRI HVI results.

*All-Tex Epic RF tested as All-Tex 65333RF

Table 2. HVI fiber property results from the replicated dryland Roundup Ready Flex cotton variety demonstration, Roger Davis Farm, Perryton, TX, 2008.

Variety	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf *	Rd	+b	Color Grade	
	units	32nds inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
NexGen 1572RF	2.5	35.7	79.1	26.9	9.5	5.0	74.6	8.1	3.7	1.3
All-Tex Epic RF	2.9	34.6	80.4	28.3	10.4	5.0	72.2	9.0	4.0	1.6
FiberMax 9058F	2.7	36.8	79.3	27.7	9.1	5.0	73.5	9.0	3.3	1.3
PhytoGen 315RF	2.6	36.2	79.1	27.1	9.3	5.0	74.4	9.1	3.0	1.3
FiberMax 9060F	2.5	37.0	78.4	28.1	8.8	5.0	74.9	9.0	3.5	1.1
Deltapine 121RF	2.7	35.5	81.1	27.6	10.1	5.0	74.0	10.8	2.3	2.3
NexGen 3550RF	2.6	34.9	79.3	26.3	9.6	5.0	71.8	9.6	3.7	2.0
Croplan Genetics 3035RF	2.5	34.6	78.6	25.1	10.1	5.0	72.0	10.5	2.7	2.7
Dyna-Gro 2400RF	2.4	34.7	78.9	26.1	10.3	5.0	71.9	10.4	3.0	2.3
AFD 5064F	2.4	34.6	78.2	25.4	9.9	5.0	73.2	10.6	2.7	2.3
Test avg.	2.6	35.5	79.2	26.9	9.7	5.0	73.2	9.6	3.2	1.8
CV, %	6.9	2.4	1.3	4.7	4.2	--	3.4	7.8	--	--
OSL	0.0388	0.0093	0.0786	0.0675	0.0019	--	0.7080	0.0053	--	--
LSD (P=.05)	0.3	1.8	NS	NS	0.8	--	NS	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, NS - not significant.
*Leaf grade was set the same for all varieties based on field average.

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5-Year Summary of the Replicated Dryland Cotton Seeding Rate and Planting Pattern Demonstration, Ag-CARES, Lamesa, TX, 2003-2008.

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

Randy Boman, Mark Kelley, and Tommy Doederlein
Extension Agronomist-Cotton, Extension Program Specialist II-Cotton, 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 29.6%) differences were minor but significant at the 0.10 level for 2 vs. 4 and 6 seed/ft solid planted. The 6 seed/ft seeding rate reduced turnout by a difference of 1.7% when compared to 2 seed/ft. Lint yield (mean 437 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 0.5451 $/lb) differences were noted at the 0.10 and 0.05 probability levels, respectively, when comparing 2 vs. 4 and 6 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 5-year time period the 2x1 skip row planting pattern did not exhibit any substantial agronomic benefit in terms of net value per land acre when compared to the solid planting pattern.

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, 2006-2008 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). Each seeding rate was initially planted in a solid pattern and in a plant 2 rows and skip 1 pattern. For ease of planting, all plots were seeded in a solid pattern and 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
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 22 oz/acre of Class Act (ammonium sulfate based spray additive). Plots were cultivated as needed for weed escapes.
Rainfall:	April - September rainfall

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

Harvest aids:	Gramoxone Max (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 (formerly International Textile Center) at Texas Tech University for HVI analysis. Commodity Credit Corporation (CCC) Loan values were determined for each plot based on HVI results. The 2008 Loan chart was used to standardize data from 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 2 x 1 skip row pattern (66.6% of solid planting rate) and reported on the land acre basis. 2008 seed and technology fee prices for FiberMax 9058F were assumed in the analysis. Seed and technology fee pricing was obtained from the 2008 Plains Cotton Growers Seed Cost Calculator. Land-acre basis seeding rates and seed and technology fee costs based on 2008 pricing for FiberMax 9058F were for the solid planted: 2 seed/row-ft, 26,136, $27.18; 4 seed/row-ft, 52,272, $54.36; and 6 seed/row-ft, 78,408, $81.54. For the 2x1 skip row pattern these were: 2 seed/row-ft, 17,424, $18.12; 4 seed/row-ft, 34,848, $36.24; and 6 seed/row-ft, 52,272, $54.36. 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 2008 Commodity Credit Corporation loan chart for the HVI values obtained. Seed value was set at $200/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 2008 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 five-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 attrition. Wind erosion control practices were timely and accurate. Lint turnout (mean 29.6%) differences were minor but significant at the 0.10 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 1.7% when compared to 2 seed/ft. Lint yield (mean 437 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 0.5451 $/lb) differences were noted at the 0.10 and 0.05 probability levels, respectively, when comparing 2 vs. 4 and 6 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 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 4.2 units) or strength (mean 29.1 g/tex). Staple (mean 35.5 32nds inch) was reduced by the highest seeding rate in the solid planting pattern when comparing 2 and 4 vs. 6 seed/ft. When comparing 4 vs. 6 seed/ft for the 2x1 skip pattern a small but significant reduction was noted. No difference in staple was observed when comparing 4 seed/ft solid vs. 6 seed/ft 2x1 skip planting patterns. Uniformity for 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 81.2%) was noted for the 2x1 skip row planting pattern vs. the solid planted.

Conclusions:

These data indicate that over a 5-year time period the 2x1 skip row planting pattern did not exhibit any substantial agronomic benefit in terms of net value per land acre when compared to the solid planting pattern. Seeding rates had a greater effect on yield and fiber quality 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 and 4 seed/ft. In terms of net value, seeding rate had the greatest 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 is critical**. 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.

Acknowledgments:

Appreciation is expressed to Danny Carmichael, Research Associate - AG-CARES, Lamesa - Texas AgriLife Research, Lubbock, for his assistance with this project.

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Table 1. Five-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 2003-2008.

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 $27.18/acre cost)	30.5	441	0.5496	241.73	4.3	35.5	81.2	29.4
4 seed/ft (52,272/acre with $54.36/acre cost)	29.3	442	0.5402	210.17	4.2	35.3	80.7	29.3
6 seed/ft (78,408/acre with $81.54/acre cost)	28.8	412	0.5381	166.72	4.2	34.7	80.5	28.9
2x1 skip row planting pattern								
2 seed/ft (17,424/acre with $18.12/acre cost)	29.5	445	0.5513	254.81	4.2	35.8	81.4	28.9
4 seed/ft (34,848/acre with $36.24/acre cost)	29.7	446	0.5492	236.70	4.3	36.0	81.7	29.3
6 seed/ft (52,272/acre with $54.36/acre cost	29.9	439	0.5419	209.59	4.2	35.6	81.4	28.9
Mean	29.6	437	0.5451	219.95	4.2	35.5	81.2	29.1
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
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
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 2008 seed and technology fees for FiberMax 9058F.

Verticillium and Fusarium Wilt Research and Demonstrations

AgriLIFE EXTENSION
Texas A&M System

Verticillium Wilt Trial Results from 2007 - 2008

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Professor, Technician, Technician, Technician, and Technician
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Small plot trials were conducted near Floydada, Ropesville, Slaton, Lamesa, Seminole, and Garden City. Plot size was 35 ft. long and two-rows wide, with 32 varieties at a site, replicated four times. The first Table provides an average of how a variety performed in all the sites that it was tested from 2007 – 2008. There are 10 sites between the two years and a variety had to be present in at least two sites to be included in Table 1.

Table 1. The relative value[1], relative yield and relative wilt ratings averaged over all sites tested in 2007 and 2008.

Variety	# of sites	Relative value	Rank of value	Relative yield	Rank of yield	Relative wilt	Rank of wilt
NexGen 2549B2RF	3	1.01	1	1.06	1	0.42	5
FiberMax 9058F	8	0.87	2	0.91	2	0.69	48
AFD 5064F	7	0.86	3	0.87	4	0.42	7
NexGen 3348B2RF	3	0.84	4	0.88	3	0.46	11
FiberMax 9180B2F	8	0.83	5	0.86	5	0.55	29
FiberMax 9063B2F	10	0.82	6	0.85	7	0.49	18
Deltapine 167RF	3	0.79	7	0.82	11	0.63	41
NexGen 1551RF	3	0.78	8	0.74	23	0.59	36
FiberMax 9160B2F	3	0.78	9	0.83	9	0.46	13
Deltapine 104B2RF	5	0.77	10	0.86	6	0.49	16
Stoneville 4288B2RF	3	0.77	11	0.83	10	0.64	44
Stoneville 5288B2RF	2	0.75	12	0.85	8	0.52	23
Paymaster 2141B2RF	2	0.74	13	0.81	12	0.28	1
FiberMax 1880B2F	5	0.74	14	0.80	13	0.38	2
Deltapine 161B2RF	2	0.74	15	0.80	14	0.49	17
FiberMax 1740B2F	5	0.74	16	0.80	15	0.56	30
Deltapine 164B2RF	6	0.73	17	0.78	16	0.49	19
PhytoGen 425RF	5	0.73	18	0.76	19	0.54	28
Deltapine 174RF	4	0.73	19	0.77	18	0.64	43
AFD 5065B2F	8	0.72	20	0.74	22	0.48	14
All-Tex Patriot RF	2	0.72	21	0.72	26	0.58	34
Deltapine 143B2RF	3	0.69	22	0.78	17	0.84	56
Cropland Genetics 4020B2RF	3	0.67	23	0.73	24	0.57	32
NexGen 1572RF	6	0.67	24	0.75	21	0.84	55
Deltapine 147RF	3	0.66	25	0.75	20	0.98	58
PhytoGen 485WRF	5	0.66	26	0.72	25	0.73	50
All-Tex Orbit RF	3	0.65	27	0.68	40	0.46	12
NexGen 3550RF	3	0.65	28	0.71	29	0.53	24
Stoneville 4554B2RF	10	0.64	29	0.71	30	0.58	33
PhytoGen 375WRF	5	0.64	30	0.71	27	0.54	27
Deltapine 121RF	3	0.64	31	0.68	39	0.60	37
Cropland Genetics 3520B2RF	3	0.62	32	0.71	31	0.56	10
Deltapine 117B2RF	4	0.62	33	0.71	28	0.60	38
Cropland Genetics 3020B2RF	3	0.62	34	0.70	34	0.43	8
Stoneville 5283RF	6	0.62	35	0.67	41	0.75	51
PhytoGen 315RF	3	0.61	36	0.69	36	0.39	3
Stoneville 5327B2RF	6	0.61	37	0.69	37	0.64	45
Deltapine 141B2RF	2	0.61	38	0.7	33	0.82	53
Americot 1532B2RF	2	0.61	39	0.66	43	0.44	9
NexGen 3273B2RF	4	0.61	40	0.69	38	0.54	26
Stoneville 5458B2RF	2	0.6	41	0.69	35	0.48	15
Stoneville 4498B2RF	3	0.59	42	0.7	32	0.52	22
Americot 1662B2RF	5	0.58	43	0.65	45	0.51	20
All-Tex Apex B2RF	5	0.58	44	0.64	46	0.62	39
NexGen 4377B2RF	4	0.58	45	0.67	42	0.56	31
All-Tex Arid B2RF	4	0.58	46	0.65	44	0.62	40
NexGen 3538RF	3	0.57	47	0.6	52	0.69	47
NexGen 1556RF	3	0.56	48	0.58	55	0.54	25
All-Tex Titan B2RF	3	0.56	49	0.63	48	0.58	35
Americot 1664B2RF	4	0.54	50	0.63	49	0.42	6
Stoneville 4427B2RF	5	0.54	51	0.64	47	0.42	4
NexGen 4370B2RF	3	0.53	52	0.62	50	0.51	21
NexGen 3331B2RF	3	0.52	53	0.61	51	0.65	46
Americot 1504B2RF	3	0.49	54	0.59	53	0.63	42
Americot 1550B2RF	2	0.48	55	0.58	54	0.83	54
Cropland Genetics 3220B2RF	2	0.47	56	0.57	57	0.72	49
Cropland Genetics 3035RF	3	0.47	57	0.57	56	0.87	57
All-Tex Epic RF	2	0.46	58	0.54	58	0.76	52

[1]Value is calculated as the yield (lbs of lint/acre) x loan value ($/lb) – (seed + technology fees [$/acre]).
Relative value is the value of a variety at a site divided by the highest average value for a variety at that site
Relative yield is the yield at a site divided by the highest average yield that occurred at that site.
Relative wilt is the wilt incidence at a site divided by the highest average wilt rating that occurred at that site

Table 2. Performance of varieties in a Verticillium wilt field near Ropesville in 2008.

Variety	Net value[2] ($/acre)	Lint yield (lb/acre)	Lint turnout (%)	% Wilt 26-Aug.	Loan value ($/lb)	Stand (plants/ft row)	RKN[3]
AFD 5064F	485 a[1]	977 ab	27.9	20.7 a-d	0.5460	2.6 ab	167
NexGen 2549B2RF	448 a	995 a	29.4	13.3 cd	0.5090	2.4 a-e	300
NexGen 3348B2RF	367 b	894 abc	28.5	20.7 a-d	0.4760	2.3 b-f	567
FiberMax 9180B2F	349 bc	824 cd	28.2	15.1 bcd	0.5010	2.8 a	767
NexGen 1551RF	345 bc	678 efg	27.7	25.8 a-d	0.5760	2.4 a-d	167
Stoneville 4288B2RF	341 bcd	827 cd	28.1	17.7 bcd	0.4890	2.0 c-i	33
Deltapine 104B2RF	328 bcd	840 bcd	26.4	17.1 bcd	0.4650	2.4 a-d	800
FiberMax 9058F	304 b-e	761 cde	26.9	24.4 a-d	0.4710	2.4 a-f	2600
AFD 5065B2F	303 b-e	724 def	25.2	24.8 a-d	0.4880	2.2 b-h	467
FiberMax 9063B2F	297 c-f	677 e-h	27.3	18.0 bcd	0.5330	2.4 a-f	1767
Paymaster 2141B2RF	290 c-f	752 def	27.2	18.7 bcd	0.4770	2.3 b-g	600
NexGen 3410RF	277 def	680 efg	24.3	21.9 a-d	0.4710	2.1 c-h	200
All-Tex Orbit RF	261 efg	635 f-i	23.4	21.3 a-d	0.4800	2.0 c-i	533
NexGen 1572RF	256 e-h	638 e-i	26.8	32.9 abc	0.4680	2.4 a-e	533
NexGen 3538RF	243 e-i	575 g-j	23.6	35.9 ab	0.5020	1.6 ij	233
PhytoGen 315RF	235 f-i	613 f-j	27.4	9.7 d	0.4690	2.5 abc	1233
Cropland Genetics 4020B2RF	209 g-j	573 g-k	25.3	21.4 a-d	0.4740	2.1 b-h	1033
Cropland Genetics 3020B2RF	202 g-j	539 h-m	25.6	15.7 bcd	0.4910	1.8 hij	1167
Deltapine 117B2RF	200 g-j	569 g-k	26.0	16.2 bcd	0.4610	2.1 c-h	433
Cropland Genetics 3520B2RF	200 g-j	538 h-m	25.5	14.8 bcd	0.4880	2.1 b-h	867
NexGen 1556RF	199 h-k	471 klm	23.6	18.3 bcd	0.5180	2.4 a-d	1750
Stoneville 5327B2RF	193 h-l	563 g-l	27.2	13.6 cd	0.4550	1.9 e-j	633
PhytoGen 375WRF	166 jkl	471 klm	24.7	15.7 bcd	0.4630	2.3 b-h	1000
Americot 1504B2RF	149 jkl	438 klm	23.4	28.2 a-d	0.4770	1.9 f-j	1233
Stoneville 4498B2RF	146 jkl	478 j-m	25.2	15.2 bcd	0.4370	2.0 d-j	1033
NexGen 3273 B2RF	146 jkl	462 klm	24.4	21.8 a-d	0.4410	1.8 hij	333
Cropland Genetics 3220B2RF	131 lm	418 m	26.1	28.7 a-d	0.4650	1.8 g-j	1467
NexGen 3331B2RF	131 lm	426 lm	25.9	10.5 d	0.4440	2.0 d-j	1267
Stoneville 4554B2RF	128 lm	416 mn	25.6	23.3 a-d	0.4600	1.6 ij	1233
Cropland Genetics 3035RF	67 m	278 n	26.1	42.4 a	0.4360	1.5 j	583

[1]Different letters mean that varieties are significantly different at $P = 0.05$.

[2]$/acre was calculated as the yield (lbs/acre) x loan value ($/lb) minus seed and technology fees for planting four seed/ft row on 40-inch centers (52,272 seed/acre).

[3]RKN is root-knot nematodes/500 cm3 soil, taken on 19 September.

Table 3. Fiber ratings for varieties in a Verticillium wilt field near Ropesville in 2008.

Variety	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b
AFD 5064F	3.80	1.09	80.9	29.6	11.4	3.5	80.2	7.6
AFD 5065B2F	2.85	1.13	79.8	29.9	11.3	2.0	81.9	7.1
Americot 1504B2F	2.45	1.15	79.8	28.1	10.9	1.5	82.1	7.6
All-Tex Orbit RF	2.55	1.16	80.0	29.2	11.0	2.5	80.8	8.8
Cropland Genetics 3020B2RF	2.80	1.10	80.2	26.3	10.9	1.5	81.7	8.0
Cropland Genetics 3035RF	2.50	1.06	78.1	27.1	10.8	3.0	79.5	9.0
Cropland Genetics 3220B2RF	2.50	1.11	78.3	26.3	10.6	2.0	81.6	8.1
Cropland Genetics 3520B2RF	2.65	1.11	79.0	26.8	11.3	2.0	82.0	8.0
Cropland Genetics 4020B2RF	2.70	1.12	77.8	26.5	10.4	2.5	81.8	8.1
Deltapine 104B2RF	2.60	1.12	80.4	29.2	11.2	3.0	80.8	7.8
Deltapine 117B2RF	2.60	1.13	79.5	29.4	9.8	4.0	77.7	7.9
FiberMax 9058F	2.90	1.20	80.5	29.6	9.5	4.0	81.2	7.5
FiberMax 9063B2F	3.20	1.20	81.9	31.5	9.7	1.5	83.6	7.2
FiberMax 9180B2F	2.80	1.17	81.0	31.8	9.9	3.0	71.8	7.5
NexGen 1551RF	3.80	1.11	81.3	31.0	10.4	1.5	79.1	8.4
NexGen 1556RF	3.00	1.13	81.9	32.0	10.3	2.5	79.1	7.9
NexGen 1572RF	2.55	1.12	80.2	27.9	10.4	3.5	79.8	7.4
NexGen 2549B2RF	3.15	1.07	82.4	29.7	11.3	3.0	79.8	8.0
NexGen 3273B2RF	2.55	1.08	78.5	25.3	10.6	2.0	81.5	8.0
NexGen 3331B2RF	2.45	1.10	79.3	27.9	10.0	4.0	78.7	8.3
NexGen 3348B2RF	2.75	1.15	81.9	30.8	10.7	4.0	79.8	8.1
NexGen 3410RF	2.60	1.18	79.7	29.3	9.8	3.0	79.8	8.2
NexGen 3538RF	2.65	1.14	80.0	29.8	9.9	1.5	80.6	8.0
PhytoGen 315RF	2.55	1.10	77.9	28.7	9.9	3.0	81.3	8.1
PhytoGen 375WRF	2.40	1.11	78.8	27.2	9.9	2.5	81.6	7.9
Paymaster 2141B2RF	2.85	1.12	81.2	28.9	10.5	3.5	79.2	7.0
Stoneville 4288B2RF	2.70	1.13	79.2	29.2	10.7	1.5	81.5	8.4
Stoneville 4498B2RF	2.35	1.09	79.7	27.4	11.2	4.0	80.5	8.3
Stoneville 4554B2RF	2.50	1.10	79.0	28.7	11.7	3.0	80.3	8.7
Stoneville 5327B2RF	2.40	1.09	79.1	28.5	10.8	2.5	80.0	8.8

Table 4. Performance of varieties in a Verticillium wilt field near Garden City in 2008.

Variety	Lint yield (lb/acre)	Net value[2] ($/acre)	% Lint	Loan value ($/lb)	% Wilt 13-Aug.	Stand (plants/ft row)
FiberMax 9160B2F	1,917 ab[1]	947 ab	28.4	0.5270	24.0 h	2.5 a-d
FiberMax 1740B2F	1,763 cd	896 bc	30.7	0.5420	48.1 a-e	3.0 ab
FiberMax 9180B2F	1,796 bc	894 bc	27.5	0.5330	44.2 a-h	2.7 a-d
Deltapine 164B2RF	1,731 cde	883 bcd	29.4	0.5450	36.7 c-h	2.6 a-d
Deltapine 161B2RF	1,715 cde	842 cde	29.4	0.5270	36.1 c-h	2.7 a-d
Cropland Genetics 4020B2RF	1,600 ef	822 c-f	28.3	0.5530	45.1 a-g	2.8 a-d
AFD 5065B2F	1,589 ef	792 d-g	26.3	0.5350	42.6 b-h	3.0 ab
FiberMax 1880B2F	1,661 c-f	789 efg	28.3	0.5140	26.4 fgh	2.9 abc
FiberMax 9063B2F	1,625 def	788 e-h	25.1	0.5240	40.9 b-h	3.1 a
Deltapine 141B2RF	1,642 def	784 e-h	26.4	0.5150	41.7 b-h	2.3 a-d
NexGen 3348B2RF	1,540 fg	783 e-h	28.7	0.5470	25.8 gh	2.2 bcd
PhytoGen 375WRF	1,598 ef	781 e-i	30.7	0.5210	36.6 c-h	2.4 a-d
Deltapine 174RF	1,555 fg	755 e-j	28.9	0.5420	46.7 a-f	2.3 a-d
Deltapine 143B2RF	1,645 c-f	745 f-k	29.7	0.4910	60.2 ab	2.1 cd
FiberMax 840B2F	1,589 ef	745 f-k	29.3	0.5090	32.4 d-h	2.5 a-d
Deltapine 104B2RF	1,555 fg	745 f-k	27.8	0.5190	34.0 c-h	2.6 a-d
All-Tex Orbit RF	1,408 ghi	730 f-l	24.0	0.5490	29.5 e-h	2.5 a-d
Americot 1532B2RF	1,433 ghi	725 h-l	28.6	0.5490	35.7 c-h	2.4 a-d
FiberMax 820F	1,545 fg	722 g-l	29.0	0.5030	40.3 b-h	2.1 cd
PhytoGen 485WRF	1,514 fgh	712 h-m	26.2	0.5050	43.3 b-h	2.6 a-d
All-Tex Patriot RF	1,369 hij	702 g-n	25.2	0.5420	38.0 c-h	2.3 a-d
Stoneville 4554B2RF	1,423 ghi	695 h-n	28.7	0.5320	39.1 c-h	2.0 d
Deltapine 147RF	1,540 fg	687 i-n	26.2	0.4790	60.5 ab	2.2 bcd
Americot 1622B2RF	1,375 hij	668 j-o	27.3	0.5300	49.8 a-e	2.7 a-d
Stoneville 5458B2RF	1,430 ghi	654 k-n	28.3	0.5020	41.2 b-h	2.4 a-d
NexGen 3273B2RF	1,365 hij	648 l-o	26.3	0.5190	40.8 b-h	2.1 cd
NexGen 4377B2RF	1,338 ij	624 mno	27.7	0.5100	36.2 c-h	2.3 a-d
All-Tex Titan B2RF	1,298 ij	618 no	25.8	0.5200	46.0 a-g	2.7 a-d
All-Tex Epic RF	1,252 j	609 no	28.3	0.5220	53.2 abc	2.4 a-d
Americot 1550B2RF	1,256 j	582 o	29.6	0.5120	64.4 a	2.4 a-d

[1]Different letters mean that varieties are significantly different at $P = 0.05$.

[2]Net value ($/acre) was calculated as the yield (lbs/acre) x loan value ($/lb) minus seed and technology fees for planting four seed/ft row on 40-inch centers (52,272 seed/acre).

Table 5. Fiber ratings for varieties in a Verticillium wilt field near Garden City in 2008

Variety	Micronaire	Length	Uniformity	Strength	Elongation	Rd	+b	Leaf
AFD 5065B2F	3.4	1.13	79.6	28.4	10.7	75.8	8.3	1.0
Americot 1532B2RF	3.5	1.15	80.8	27.5	9.6	78.1	7.8	1.5
Americot 1550B2RF	3.2	1.10	79.3	27.4	9.8	77.2	7.7	3.0
Americot 1622B2RF	3.2	1.11	80.6	26.6	10.1	78.0	8.0	1.5
All-Tex Epic RF	3.4	1.09	79.5	27.5	10.5	76.0	9.0	2.0
All-Tex Orbit RF	3.5	1.17	82.0	28.2	11.0	76.6	8.6	1.5
All-Tex Patriot RF	3.6	1.16	81.0	28.8	10.6	75.7	8.2	2.0
All-Tex Titan B2RF	3.5	1.17	80.9	28.5	10.1	76.8	7.3	1.5
Cropland Genetics 4020B2RF	3.5	1.13	80.1	26.8	10.2	78.6	7.6	2.0
Deltapine 104B2RF	3.4	1.12	80.7	28.8	10.6	75.0	8.4	2.5
Deltapine 141B2RF	3.0	1.15	78.8	28.4	9.6	76.8	8.1	3.0
Deltapine 143B2RF	3.0	1.15	78.6	27.8	9.0	77.0	8.2	3.0
Deltapine 147RF	3.0	1.15	79.1	28.5	8.4	76.0	8.6	2.5
Deltapine 161B2RF	3.2	1.18	80.1	29.3	9.3	77.8	8.3	2.5
Deltapine 164B2RF	3.3	1.17	80.1	29.8	9.0	78.0	7.8	1.5
Deltapine 174RF	3.5	1.16	80.0	27.9	9.7	75.7	7.9	3.0
FiberMax 1740B2F	3.5	1.14	80.7	29.3	9.2	78.6	7.3	2.0
FiberMax 1880B2F	3.2	1.14	79.7	29.8	9.4	78.8	7.4	3.0
FiberMax 820F	3.1	1.19	80.1	30.6	8.9	76.4	7.5	2.5
FiberMax 840B2F	3.3	1.19	80.8	31.0	9.5	77.9	6.8	3.5
FiberMax 9063B2F	3.2	1.19	81.1	31.6	9.0	77.3	7.8	2.0
FiberMax 9180B2F	3.4	1.17	81.8	30.9	9.2	76.9	7.8	2.0
FiberMax 9160B2F	3.0	1.15	80.2	30.0	8.4	77.9	7.9	2.5
NexGen 3273B2RF	3.4	1.13	80.6	26.9	10.3	79.7	6.8	2.5
NexGen 3348B2RF	3.5	1.14	81.6	30.1	9.6	75.6	8.4	3.5
NexGen 4377B2RF	3.4	1.10	81.2	28.0	10.5	74.7	7.8	3.5
PhytoGen 375WRF	3.3	1.12	80.2	28.0	9.5	77.3	7.6	2.5
PhytoGen 485WRF	3.7	1.15	82.8	29.5	11.0	74.2	7.3	4.5
Stoneville 4554B2RF	3.2	1.13	80.1	29.6	11.5	76.1	8.5	3.0
Stoneville 5458B2RF	3.2	1.10	78.0	28.2	9.3	75.8	8.5	2.5

Table 6. Performance of varieties in a Verticillium wilt field in Lynn County in 2008

Variety	Lint yield (lb/acre)	Net value[2] ($/acre)	Loan value ($/lb)	% Lint	% Wilt 13-Aug.	Stand (plants/ft row)
AFD 5064F	943 ab[1]	466 a	0.5460	26.2	13.6 d-h	2.9 a-e
Stoneville 5288B2RF	989 a	417 ab	0.4870	28.1	11.7 fgh	2.7 c-g
PhytoGen 425RF	866 a-e	415 abc	0.5400	26.6	17.7 c-h	3.1 ab
Deltapine 104B2RF	935 ab	404 a-d	0.4980	27.2	20.2 b-f	3.1 a
FiberMax 1740B2F	899 abc	398 a-e	0.5130	29.0	20.2 b-f	3.0 abc
FiberMax 9058F	906 ab	397 a-e	0.4990	27.4	24.5 bc	2.9 a-f
FiberMax 1880B2F	825 a-f	375 b-f	0.5310	25.4	12.3 e-h	2.7 a-f
FiberMax 9180B2F	848 a-f	363 b-g	0.5030	26.6	14.6 d-h	2.9 a-d
FiberMax 9063B2F	787 b-g	356 b-h	0.5320	26.8	20.5 b-f	2.9 a-d
Stoneville 4554B2RF	776 b-g	353 b-h	0.5360	26.1	17.6 c-h	2.1 jk
Stoneville 4288B2RF	830 a-f	348 b-i	0.5040	27.7	14.3 d-h	2.8 a-f
NexGen 1572B2RF	891 a-d	343 b-i	0.4330	30.5	37.4 a	2.5 d-i
NexGen 1551RF	712 e-i	338 c-i	0.5380	25.2	21.9 bcd	2.5 d-i
FiberMax 9160B2F	807 b-g	332 d-i	0.4910	28.5	11.8 fgh	2.6 d-i
Stoneville 4498B2RF	776 b-g	326 d-j	0.5020	26.8	21.1 b-e	2.8 a-f
Cropland Genetics 3520B2RF	772 b-g	326 d-j	0.5030	26.0	12.6 e-h	2.9 a-e
NexGen 4377B2RF	780 b-g	318 f-k	0.4820	25.3	19.7 b-g	2.5 f-j
Stoneville 5283RF	735 c-h	314 f-l	0.5020	27.4	19.7 b-g	2.5 e-i
PhytoGen 375WRF	733 c-h	309 f-l	0.4930	27.2	16.4 c-h	2.6 c-g
Cropland Genetics 3020B2RF	729 d-h	298 f-m	0.4950	24.3	13.0 d-h	2.3 g-j
Stoneville 5327B2RF	717 e-i	292 g-m	0.4960	27.6	24.6 bc	2.2 ijk
NexGen 4370B2RF	690 f-i	292 g-m	0.5080	23.3	16.6 c-h	2.6 c-h
Americot 1504B2RF	682 f-i	277 i-m	0.4940	23.5	16.9 c-h	2.7 a-f
NexGen 3331B2RF	692 f-i	276 i-m	0.4830	26.7	19.0 b-g	2.2 ijk
PhytoGen 315RF	690 f-i	275 i-m	0.4830	24.0	10.7 gh	2.9 a-d
Cropland Genetics 3035RF	708 e-i	257 j-m	0.4360	25.8	26.9 b	2.1 j
NexGen 1556RF	578 hi	250 j-m	0.5110	22.5	18.7 b-g	2.9 a-d
Americot 1664B2RF	595 hi	248 j-m	0.5200	26.0	12.9 d-h	2.6 d-h
Stoneville 4427B2RF	648 ghi	243 lm	0.4740	24.3	10.7 gh	2.2 hij
NexGen 3538RF	554 i	226 m	0.4910	20.7	18.1 b-h	2.1 jk

[1]Different letters mean that varieties are significantly different at $P = 0.05$.

[2]Net value ($/acre) was calculated as the yield (lbs/acre) x loan value ($/lb) minus seed and technology fees for planting four seed/ft row on 40-inch centers (52,272 seed/acre).

Table 7. Fiber ratings for varieties in a Verticillium wilt field in Lynn County in 2008

Variety	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b
AFD 5064F	3.7	1.13	81.4	30.9	10.2	2.5	77.4	7.3
Americot 1504B2RF	3.0	1.15	80.0	27.6	10.2	2.0	80.6	7.2
Americot 1664B2RF	3.1	1.14	80.1	27.3	10.7	2.0	78.5	7.5
Cropland Genetics 3020B2RF	2.9	1.09	80.0	26.3	10.1	1.0	80.9	7.4
Cropland Genetics 3035RF	2.6	1.07	78.5	27.2	10.5	1.0	78.1	8.4
Cropland Genetics 3520B2RF	3.1	1.13	79.6	27.1	10.4	2.5	78.1	7.7
Deltapine 104B2RF	3.0	1.15	81.0	29.3	10.8	2.5	78.3	7.5
FiberMax 1740B2F	3.0	1.12	80.3	29.3	9.9	1.0	80.1	7.3
FiberMax 1880B2F	3.1	1.18	81.1	30.5	9.2	2.0	80.2	7.6
FiberMax 9058F	3.0	1.18	79.8	28.7	8.8	1.5	78.8	7.1
FiberMax 9063B2F	3.2	1.20	80.9	32.2	8.9	1.5	80.5	6.9
FiberMax 9160B2F	2.9	1.19	81.6	30.3	8.7	1.0	80.3	7.1
FiberMax 9180B2F	2.8	1.16	80.4	31.3	9.3	1.0	80.9	7.2
NexGen 1551RF	3.6	1.15	80.4	32.0	9.6	1.5	77.0	8.1
NexGen 1556RF	3.2	1.15	81.8	31.7	9.8	2.5	77.2	7.8
NexGen 1572RF	2.6	1.13	79.3	29.2	10.0	3.0	78.5	6.7
NexGen 3331B2RF	2.7	1.11	80.4	29.2	9.3	2.0	77.3	8.3
NexGen 3538RF	2.8	1.19	81.3	31.3	9.2	1.0	78.9	7.7
NexGen 4370B2RF	3.1	1.13	80.4	28.0	10.5	1.5	78.6	8.1
NexGen 4377B2RF	2.8	1.13	81.1	28.1	10.4	3.0	77.3	7.9
PhytoGen 315RF	2.9	1.11	78.6	26.7	9.3	3.0	78.8	7.7
PhytoGen 375WRF	2.9	1.13	79.1	27.7	9.5	2.0	79.5	7.7
PhytoGen 425RF	3.5	1.15	81.5	28.7	10.8	2.5	76.2	8.1
Stoneville 4427B2RF	2.7	1.10	78.4	27.9	9.3	1.5	78.3	8.1
Stoneville 4288B2RF	3.1	1.15	79.0	29.4	10.2	2.0	78.3	8.1
Stoneville 4498B2RF	3.0	1.16	80.8	31.0	10.6	3.5	78.2	7.9
Stoneville 4554B2RF	3.3	1.16	80.7	29.3	10.9	1.5	77.9	8.5
Stoneville 5283RF	2.8	1.12	79.1	30.2	9.8	2.0	77.9	8.5
Stoneville 5288B2RF	2.8	1.12	77.6	28.6	9.5	2.5	79.6	7.1
Stoneville 5327B2RF	3.0	1.14	80.3	30.5	9.7	1.0	76.5	8.2

Table 8. Performance of varieties in a Verticillium wilt field in Floyd County in 2008.

Variety	Lint yield (lb/acre)	Net value[2] ($/acre)	% Lint	Loan value ($/lb)	% Wilt 28-Aug.	Stand (plants/ft row)
FiberMax 9180B2F	1,579 a[1]	798 a	33.0	0.5450	12.2 de	3.7 ab
FiberMax 9058F	1,488 abc	693 b	32.3	0.5020	13.7 cde	3.6 abc
NexGen 2549B2RF	1,514 ab	681 bc	32.3	0.4890	20.7 a-e	3.3 d-i
FiberMax 9063B2F	1,476 a-d	672 bcd	30.2	0.4990	12.2 de	3.4 a-e
NexGen 1551RF	1,313 c-f	650 b-e	31.5	0.5300	15.0 cde	3.4 a-f
Stoneville 4288B2RF	1,346 b-e	628 b-f	32.7	0.5140	29.4 ab	2.8 kl
AFD 5065B2F	1,320 c-f	620 b-f	29.9	0.5130	19.6 a-e	3.1 e-k
Stoneville 4554B2RF	1,306 c-f	604 c-g	32.0	0.5100	26.3 abc	2.8 kl
Paymaster 2141B2RF	1,311 c-f	595 c-h	33.1	0.5000	9.3 e	3.7 a
NexGen 1572RF	1,284 d-g	583 d-i	32.6	0.4870	20.0 a-e	3.3 c-g
Cropland Genetics 3020B2RF	1,275 efg	567 e-j	29.8	0.4940	14.1 cde	3.1 e-k
NexGen 3273B2RF	1,263 e-h	553 f-k	29.2	0.4850	17.1 a-e	2.8 kl
Deltapine 104B2RF	1,302 c-f	545 f-l	30.4	0.4660	11.4 de	3.5 a-e
NexGen 3550RF	1,311 c-f	541 f-m	29.9	0.4460	14.0 cde	3.2 d-j
Stoneville 5288B2RF	1,251 e-h	541 f-m	32.8	0.4830	20.5 a-e	3.3 c-h
PhytoGen 315RF	1,236 e-i	541 f-m	31.2	0.4800	15.8 b-e	3.5 a-d
Stoneville 4498B2RF	1,280 efg	528 g-m	30.9	0.4620	15.1 cde	3.1 e-k
Cropland Genetics 3520B2RF	1,229 e-j	522 g-m	28.8	0.4760	16.3 a-e	3.5 a-d
Deltapine 117B2RF	1,246 e-h	520 g-m	29.1	0.4670	18.6 a-e	3.3 c-h
PhytoGen 375WRF	1,211 e-j	519 g-m	30.7	0.4720	17.8 a-e	3.7 a
NexGen 1556RF	1,106 g-k	510 h-n	28.0	0.5030	17.3 a-e	3.0 g-l
Americot 1664B2RF	1,139 f-k	508 h-n	29.4	0.4990	14.1 cde	3.0 f-l
Cropland Genetics 3035RF	1,174 e-k	507 h-n	32.0	0.4800	23.6 a-d	2.9 kl
NexGen 3538RF	1,042 jk	501 i-n	26.2	0.5240	20.0 a-e	2.1 m
Deltapine 121RF	1,093 g-k	496 i-n	29.9	0.5020	17.3 a-e	3.3 b-g
NexGen 4370B2RF	1,141 f-k	485 j-n	29.8	0.4750	16.8 a-e	2.8 kl
NexGen 4377B2RF	1,153 e-k	466 k-o	30.3	0.4550	17.4 a-e	2.7 l
NexGen 3331B2RF	1,074 h-k	462 l-o	30.9	0.4850	29.5 a	2.9 h-l
Stoneville 5327B2RF	1,051 ijk	458 l-o	30.6	0.4960	20.4 a-e	3.0 g-l
Stoneville 5283RF	1,041 jk	448 mno	31.0	0.4820	21.3 a-e	2.9 i-l
Stoneville 4427B2RF	1,095 g-k	427 no	28.8	0.4470	19.4 a-e	2.9 jkl
Americot 1504B2RF	990 k	386 o	26.5	0.4510	20.6 a-e	3.3 c-g

[1]Different letters mean that varieties are significantly different at $P = 0.05$.

[2]Net value ($/acre) was calculated as the yield (lbs/acre) x loan value ($/lb) minus seed and technology fees for planting four seed/ft row on 40-inch centers (52,272 seed/acre).

Table 9. Fiber ratings for varieties in a Verticillium wilt field in Floyd County in 2008

Variety	Micronaire	Length	Uniformity	Strength	Elongation	Rd	+b	Leaf
AFD 5065B2F	3.7	1.11	80.9	28.4	10.7	74.3	7.3	4.0
Americot 1504B2RF	3.2	1.19	82.0	27.5	10.1	72.8	7.0	5.0
Americot 1664B2RF	3.2	1.13	81.3	26.2	10.7	72.5	7.6	3.0
Cropland Genetics 3020B2RF	3.2	1.10	81.4	26.1	10.3	74.5	7.8	2.0
Cropland Genetics 3035RF	2.9	1.10	81.4	28.1	10.8	73.7	8.3	3.5
Cropland Genetics 3520B2RF	3.1	1.10	80.9	26.4	10.5	72.8	7.3	4.0
Deltapine 104B2RF	3.2	1.10	82.5	29.2	10.8	73.2	7.5	5.5
Deltapine 117B2RF	3.4	1.10	81.2	29.3	10.8	71.5	7.6	4.5
Deltapine 121RF	3.5	1.13	82.2	28.3	10.4	71.8	7.7	4.5
FiberMax 9058F	3.3	1.17	81.7	29.2	8.8	74.3	7.0	4.0
FiberMax 9063B2F	3.5	1.19	81.5	30.7	9.5	72.5	7.5	4.0
FiberMax 9180B2F	3.7	1.17	83.1	30.7	9.6	75.2	7.4	3.0
NexGen 1551RF	4.2	1.08	82.6	29.5	9.9	71.6	8.1	4.0
NexGen 1556RF	3.7	1.10	82.6	30.5	9.8	72.4	7.6	3.0
NexGen 1572RF	3.3	1.08	80.5	27.0	9.8	73.1	7.3	5.0
NexGen 2549B2RF	3.7	1.07	82.4	27.5	11.0	72.0	7.2	5.5
NexGen 3273B2RF	3.1	1.13	80.8	25.9	10.4	75.6	7.6	2.5
NexGen 3331B2RF	3.1	1.12	81.9	28.5	9.9	72.2	8.0	4.5
NexGen 3538RF	3.4	1.16	82.6	30.1	9.4	74.4	7.6	3.0
NexGen 3550RF	3.3	1.11	79.4	29.0	10.4	70.7	7.7	5.5
NexGen 4370B2RF	3.1	1.11	81.5	28.1	10.0	72.2	7.8	4.5
NexGen 4377B2RF	2.9	1.09	81.4	26.9	10.4	72.4	7.7	4.5
PhytoGen 315RF	3.0	1.11	81.1	27.2	10.1	73.0	7.7	3.5
PhytoGen 375WRF	2.9	1.12	80.9	27.1	10.1	74.4	7.7	3.5
Paymaster 2141B2RF	3.8	1.09	81.7	27.1	10.1	72.8	7.4	5.0
Stoneville 4288B2RF	3.7	1.12	81.1	27.4	10.2	73.5	7.7	5.0
Stoneville 4427B2RF	2.9	1.11	81.4	28.9	9.6	72.3	7.7	5.0
Stoneville 4498B2RF	3.2	1.12	81.5	28.1	11.1	72.1	8.1	5.0
Stoneville 4554B2RF	3.4	1.12	81.7	27.4	10.4	72.7	7.6	4.0
Stoneville 5283RF	3.0	1.11	81.8	28.9	10.4	72.8	7.9	3.0
Stoneville 5288B2RF	3.4	1.10	80.6	28.1	9.9	73.9	6.9	4.0
Stoneville 5327B2RF	3.0	1.12	81.1	29.1	9.8	71.7	8.0	4.0

Table 10. Performance of varieties in a Verticillium wilt field near Lamesa in 2008

Variety	Net value[2] ($/acre)	Lint yield (lb/acre)	% Lint	Loan value ($/lb)	% Wilt 17-Sept.	Stand (plants/ft row)
NexGen 2549B2RF	441 a[1]	1,141 a	27.1	0.4380	3.2 f	3.1 a-e
NexGen 3348B2RF	337 b	833 bc	25.0	0.4740	8.6 b-f	2.7 a-i
Deltapine 104B2RF	330 0bc	869 b	24.0	0.4520	9.6 b-f	3.0 0a-g
All-Tex Patriot RF	299 b-e	722 c-f	24.1	0.4730	11.0 0b-e	2.6 d-j
FiberMax 9063B2F	290 0b-f	713 c-g	24.9	0.4970	5.7 c-f	3.1 a-f
All-Tex AridB2RF	282 b-g	740 0cde	24.4	0.4540	12.4 a-d	2.7 a-i
FiberMax 1880B2F	277 c-h	716 c-g	22.7	0.4760	7.5 b-f	2.9 a-g
FiberMax 9160B2F	276 c-h	708 0d-g	25.2	0.4790	12.2 a-d	2.6 d-j
PhytoGen 375WRF	271 d-i	738 c-f	24.6	0.4380	11.5 b-e	3.1 a-f
FiberMax 960B2R	267 d-j	668 d-h	24.0	0.4800	10.3 0b-e	2.8 a-i
NexGen 3273B2RF	257 d-k	704 0d-g	23.7	0.4490	8.5 b-f	2.6 c-i
All-Tex Apex B2RF	248 e-l	661 d-i	21.6	0.4620	10.8 0b-e	2.8 a-i
Deltapine 161B2RF	246 e-m	669 d-h	20.5	0.4600	8.3 b-f	3.1 a-d
Americot 1622B2RF	234 f-m	652 e-i	21.7	0.4560	6.7 b-f	3.2 ab
Cropland Genetics 4020B2RF	230 0g-n	642 e-j	20.9	0.4560	8.8 b-f	3.2 abc
FiberMax 1740B2F	222 h-n	624 e-k	25.1	0.4410	5.5 def	2.9 a-h
Stoneville 5458B2RF	216 i-o	617 f-l	21.3	0.4530	6.2 c-f	2.9 a-g
FiberMax 9180B2F	214 j-o	582 h-m	23.4	0.4770	9.0 0b-f	2.7 a-i
All-Tex Orbit RF	206 k-o	525 j-o	19.3	0.4740	7.4 b-f	2.5 f-j
Stoneville 4554B2RF	200 l-p	595 g-m	22.7	0.4420	10.5 0b-e	2.6 d-j
PhytoGen 485WRF	199 l-p	549 h-o	20.9	0.4580	13.5 ab	2.7 a-i
Deltapine 164B2RF	198 l-q	558 h-n	20.8	0.4660	10.1 0b-f	2.4 hij
NexGen 4377B2RF	192 m-r	543 i-o	23.1	0.4610	10.9 0b-e	2.1 j
Americot 1532B2RF	191 m-r	550 0h-o	21.0	0.4570	6.6 b-f	3.2 a
Cropland Genetics 3220B2RF	163 o-s	501 0l-p	20.9	0.4500	12.5 abc	2.6 b-i
Deltapine 141B2RF	163 o-s	492 m-p	20.6	0.4580	19.0 0a	2.7 a-i
Americot 1550B2RF	146 p-s	478 m-p	19.0	0.4310	12.6 abc	2.6 d-j
NexGen 4370B2RF	138 rs	451 nop	20.7	0.4340	8.4 b-f	2.6 d-j
All-Tex Epic RF	120 0s	381 p	19.0	0.4280	13.5 ab	2.6 e-j

[1]Different letters mean that varieties are significantly different at $P = 0.05$.

[2]Net value ($/acre) was calculated as the yield (lbs/acre) x loan value ($/lb) minus seed and technology fees for planting four seed/ft row on 40-inch centers (52,272 seed/acre).

Table 11. Fiber ratings for varieties in a Verticillium wilt field near Lamesa in 2008

Variety	Micronaire	Length	Uniformity	Strength	Elongation	Leaf	Rd	+b
Americot 1532B2RF	2.2	1.11	78.8	25.9	9.9	2.5	83.4	7.7
Americot 1550B2RF	2.2	1.06	77.5	25.3	9.9	1.0	82.7	9.0
Americot 1622B2RF	2.4	1.08	80.1	26.0	10.7	2.0	83.7	8.0
All-Tex Orbit RF	2.4	1.11	80.8	27.4	11.3	2.0	84.1	8.4
All-Tex Patriot RF	2.6	1.10	78.9	28.5	10.8	1.5	83.5	8.1
All-Tex Epic RF	2.1	1.06	77.5	26.5	10.0	2.0	83.4	8.5
All-Tex Apex B2RF	2.3	1.11	78.5	25.8	9.9	1.5	83.8	8.0
All-Tex Arid B2RF	2.5	1.07	79.7	27.4	10.3	2.5	83.3	7.6
FiberMax 9160B2F	2.3	1.14	80.7	29.1	9.7	1.0	83.7	8.1
Cropland Genetics 3220B2RF	2.2	1.08	78.3	26.3	10.3	1.5	83.8	8.2
Cropland Genetics 4020B2RF	2.3	1.10	78.0	26.0	9.8	2.5	82.6	7.8
Deltapine 104B2RF	2.5	1.10	80.7	29.0	11.0	3.5	82.6	7.8
Deltapine 141B2RF	2.2	1.12	78.2	27.6	9.8	3.5	80.9	8.0
Deltapine 161B2RF	2.2	1.10	77.1	26.4	9.5	2.0	83.3	8.2
Deltapine 164B2RF	2.2	1.12	77.0	26.5	9.6	2.0	83.2	7.7
FiberMax 1740B2F	2.4	1.06	78.4	26.5	10.0	1.0	84.9	8.0
FiberMax 1880B2F	2.3	1.14	79.8	28.6	9.7	2.0	83.1	7.9
FiberMax 9063B2F	2.7	1.16	80.8	30.4	9.9	1.5	84.5	7.6
FiberMax 9180B2F	2.4	1.12	81.0	29.1	10.0	1.5	85.4	7.7
FiberMax 960B2R	2.4	1.12	80.8	29.0	8.9	1.5	84.2	7.9
NexGen 2549B2RF	2.7	1.02	79.6	27.0	11.0	2.5	81.9	8.0
NexGen 3273B2RF	2.3	1.09	78.8	26.1	10.5	2.5	84.7	7.7
NexGen 3348B2RF	2.6	1.14	80.9	29.0	10.8	3.0	82.1	8.1
NexGen 4370B2RF	2.2	1.07	78.8	26.2	9.9	4.0	80.8	8.1
NexGen 4377B2RF	2.4	1.09	80.1	26.4	10.7	3.0	82.7	8.2
PhytoGen 375WRF	2.4	1.08	79.4	25.6	10.1	3.0	82.2	8.5
PhytoGen 485WRF	2.4	1.11	80.0	29.1	11.1	3.5	80.0	8.4
Stoneville 4554B2RF	2.3	1.08	78.5	26.9	11.8	3.5	81.0	8.4
Stoneville 5458B2RF	2.3	1.09	78.1	28.3	9.4	2.0	80.9	8.4

AgriLIFE EXTENSION
Texas A&M System

Fusarium Wilt Trial Results from 2007 - 2008

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Field trials were conducted in 2008 to evaluate commercially available cotton varieties in fields with a history of Fusarium wilt. A total of six trials were conducted; however, four were lost to the hot, dry, windy conditions experienced in early June. In addition, one of the remaining trials (Dawson County Trial) had to be replanted due to harsh environmental conditions. Disease pressure at this location was very low, and the results from the trial were somewhat inconsistent with what was observed in 2007. A preliminary ranking of varieties tested is listed in Table 5. Continued screening will take place during the 2009 growing season. If you have any questions pertaining to the selection of cotton varieties with regard to Fusarium wilt, please contact Jason Woodward via phone (806) 746-4053, or e-mail jewoodward@ag.tamu.edu.

Table 1. Lint yields, net returns, loan values, turnout, disease ratings for cotton varieties evaluated in Gaines County, TX, 2002[a]

Variety	Lint yield (lb/acre)	Net return ($/acre)[b]	Loan value ($/lb)	% Lint	Verticillium wilt (%)	Fusarium wilt (% death)[c]	Root-knot (nematodes/ pint soil)
DP 174RF	1733 a[d]	862 a	0.5280	35.8	22.3 a	0.0	353
ST 5458B2RF	1423 b	650 b	0.5010	35.2	11.7 a-h	0.0	1367
ST 4554B2RF	1136 bc	546 bc	0.5370	35.3	17.2 a-d	0.0	1467
NG 3410RF	1068 cd	524 bcd	0.5310	33.5	4.0 gh	0.3	1500
AT Apex B2RF	1041 cde	505 b-e	0.5400	33.4	12.0 a-h	1.0	2320
DP 164B2RF	930 c-f	452 c-g	0.5530	32.3	7.0 c-h	0.7	2547
AM 1532B2RF	924 c-f	450 c-g	0.5520	34.6	13.6 a-g	1.3	3080
DP 161B2RF	915 c-f	449 c-g	0.5590	31.8	6.1 d-h	3.6	2767
FM 9160B2F	914 c-f	432 c-h	0.5420	35.6	1.8 h	0.0	2220
AT Orbit RF	881 c-g	445 c-g	0.5530	29.7	5.7 e-h	0.0	2447
DP 104B2RF	868 c-g	392 d-i	0.5230	33.3	3.9 gh	5.1	1667
AT Patriot RF	854 d-g	407 c-h	0.5270	32.8	7.7 b-h	0.0	3267
AFD 5065B2F	848 d-h	411 c-h	0.5520	32.2	5.8 e-h	2.3	2000
DP 143B2RF	833 d-h	344 e-k	0.4890	32.7	12.3 a-h	1.9	2327
FM 9063B2F	817 d-i	379 d-j	0.5420	34.5	5.9 d-h	1.9	3007
FM 9180B2F	809 d-i	376 d-j	0.5430	32.7	5.0 fgh	3.3	1827
AM 1622B2RF	807 d-i	365 e-j	0.5270	31.3	13.9 a-g	6.5	3133
PG 485WRF	788 d-j	341 f-k	0.5000	32.0	18.2 abc	3.1	1460
DP 147RF	773 d-j	365 e-j	0.5400	34.5	8.7 b-h	1.3	1153
FM 1880B2F	764 e-j	327 f-k	0.5120	33.1	4.6 fgh	0.3	3973
NG 4370B2RF	762 e-j	339 f-k	0.5220	33.6	7.8 b-h	9.8	2100
CG 4020B2RF	737 f-j	340 f-k	0.5470	31.8	12.9 a-h	2.1	4520
AT Titan B2RF	717 f-j	338 f-k	0.5510	29.2	11.1 a-h	5.0	2233
AT Epic RF	685 f-j	327 f-k	0.5400	34.9	16.0 a-f	18.7	2020
AM 1550B2RF	683 f-j	302 g-k	0.5310	36.4	18.7 ab	17.9	1520
CG 3035RF	614 g-j	283 h-k	0.5490	34.8	16.4 a-e	9.1	2867
DP 167RF	550 hij	244 jk	0.5390	30.1	4.9 fgh	0.5	1680
FM 820F	549 hij	244 jk	0.5440	33.6	4.4 gh	1.6	2253
PG 375WRF	549 ij	238 jk	0.5290	34.2	9.9 b-h	3.4	2567
FM 840B2F	513 j	208 k	0.5300	32.7	6.9 c-h	22.8	1500

[a] This field had a combination of Fusarium wilt, root-knot nematode, and Verticillium wilt.

[b] Net returns = (lint yield × loan value) – (seed costs + technology fees) for 52,272 seed/acre.

[c] The percentage of plants within a plot killed by *Fusarium oxysporum* f. sp. *vasinfectum.*

[d] Data are the means from four replications. Means within a column followed by the same letter are not different according to Fisher's protected least significant differences test (*P* =0.05).

Table 2. Fiber quality parameters for cotton varieties evaluated in a Fusarium wilt trial in Gaines County TX, 2008

Variety	Micronaire	Length	Uniformity	Strength	Elongation	Rd	+b	Leaf
AFD 5065B2F	4.5	1.11	82.7	28.6	10.3	78.2	6.9	3.0
AM 1532B2RF	4.4	1.10	81.6	26.5	10.0	77.2	7.2	2.5
AM 1550B2RF	4.2	1.07	81.7	26.6	9.9	75.3	7.8	3.0
AM 1622B2RF	4.3	1.05	82.3	26.4	10.2	76.6	7.4	3.0
AT Apex B2RF	4.3	1.13	82.4	26.7	10.1	77.0	7.5	4.0
AT Epic RF	3.9	1.07	80.9	27.3	11.0	76.1	8.3	3.5
AT Orbit RF	4.1	1.14	82.2	28.7	10.4	77.6	7.5	3.0
AT Patriot RF	4.4	1.13	81.9	28.5	10.2	76.7	7.5	4.0
AT Titan B2RF	4.0	1.16	82.3	28.3	9.9	77.7	7.1	3.5
CG 3035RF	3.6	1.08	81.9	28.3	10.7	76.3	8.2	2.0
CG 4020B2RF	4.0	1.09	81.7	26.1	10.0	76.7	7.7	3.0
DP 104B2RF	4.1	1.10	82.9	29.1	10.4	75.7	7.2	4.5
DP 143B2RF	3.6	1.12	80.3	27.0	9.4	74.5	7.0	5.0
DP 147RF	3.9	1.13	81.3	28.9	8.8	76.3	7.1	3.5
DP 161B2RF	4.1	1.17	83.0	30.3	8.8	77.8	7.5	2.5
DP 164B2RF	4.0	1.15	81.8	29.3	8.8	77.9	7.6	3.0
DP 167RF	3.7	1.12	81.3	28.1	9.0	77.2	7.1	2.5
DP 174RF	4.3	1.14	81.9	27.5	10.3	76.1	7.6	3.5
FM 1880B2F	3.6	1.11	81.4	29.5	9.6	75.7	6.4	4.5
FM 820F	3.8	1.15	81.7	30.5	8.5	78.5	6.8	2.5
FM 840B2F	3.8	1.15	81.5	30.5	9.3	77.0	6.6	4.5
FM 9063B2F	4.5	1.14	81.8	29.8	8.9	78.1	6.8	2.0
FM 9160B2F	4.1	1.13	82.9	28.9	8.4	77.8	7.0	2.5
FM 9180B2F	4.3	1.13	82.6	29.7	9.4	77.9	6.7	3.5
NG 3410RF	4.1	1.14	83.2	30.1	9.6	74.4	7.5	4.5
NG 4370B2RF	4.2	1.09	82.6	27.3	9.8	74.1	7.6	4.5
PG 375WRF	4.0	1.07	81.3	27.3	9.8	75.0	7.2	3.5
PG 485WRF	4.3	1.09	82.1	28.0	10.7	72.7	7.4	5.0
ST 4554B2RF	4.7	1.10	83.0	29.3	11.8	75.1	7.9	2.5
ST 5458B2RF	4.4	1.10	81.5	29.4	9.3	73.5	7.8	5.0

Table 3. Disease ratings, yields, loan values, and net returns for cotton varieties evaluated in a Fusarium wilt trial in Dawson, TX, 2008

Variety	Disease incidence (%)[a]	Lint yield (lb/acre)	% Lint	Loan value ($/lb)	Net return ($/acre)[b]
DP 104B2RF	1.5 cdefg[c]	1110.5 ab[c]	29.3	0.4740	497.90 a[c]
ST 5458B2RF	0.9 fg	1164.9 a	30.3	0.4580	485.93 ab
ST 4554B2RF	1.1 defg	1090.0 abc	31.0	0.5370	474.41 ab
DP 174RF	2.2 cdefg	1156.3 a	30.7	0.4670	470.05 ab
ST 5327B2RF	2.1 cdefg	1014.5 abcd	34.2	0.4550	448.12 abc
NG 3348B2RF	0.9 efg	926.7 bcde	30.7	0.4820	431.23 abcd
PM 2141B2RF	0.5 g	905.0 cdef	30.9	0.4960	406.71 abcde
AT EpicRF	4.2 a	845.9 defg	31.6	0.4870	397.10 bcdef
AFD 5064F	1.5 cdefg	843.8 defgh	28.4	0.5110	391.35 bcdefg
CG 3220B2RF	1.7 cdefg	872.0 defg	30.9	0.5320	366.41 cdefgh
NG 3410RF	0.5 g	894.0 def	29.0	0.4670	364.01 cdefgh
AM 1532B2RF	1.2 defg	875.1 defg	27.0	0.5320	357.88 cdefgh
ST 4498B2RF	0.7 g	861.1 defg	29.2	0.4960	353.13 cdefgh
DP 161B2RF	1.5 cdefg	741.6 efghijk	26.8	0.4740	329.41 efghij
CG 3035RF	4.1 ab	794.7 efghi	29.0	0.5240	310.58 fghij
DP 141B2RF	1.6 cdefg	770.5 efghij	28.9	0.4820	307.41 fghij
PG 315RF	3.0 abcd	783.9 efghij	32.1	0.4550	301.38 fghij
AM 1550B2RF	2.7 abcdef	733.3 fghijk	31.7	0.5400	300.26 ghij
FM 1880B2F	1.2 defg	726.7 fghijk	30.4	0.5070	293.59 hij
FM 9058F	2.8 abcde	720.3 fghijk	29.7	0.4960	279.17 hij
FM 9180B2F	0.9 fg	740.0 efghijk	29.1	0.5230	278.73 hij
AFD 5065B2F	1.0 defg	694.0 ghijk	28.2	0.5400	274.20 hij
PG 375WRF	3.3 abc	563.2 k	30.3	0.4880	248.96 j
FM 9063B2F	0.7 g	593.2 jk	29.5	0.4550	248.91 j
ST 5283RF	3.4 abc	650.6 hijk	28.4	0.4960	242.30 j

[a] The percentage of plants within a plot exhibiting Fusarium wilt symptoms.

[b] Net returns = (lint yield × loan value) – (seed costs + technology fees) for 55,023 seed/acre.

[c] Data are the means from four replications. Means within a column followed by the same letter are not different according to Fisher's protected least significant differences test (P=0.05).

Table 4. Fiber quality parameters for cotton varieties evaluated in a Fusarium wilt trial in Dawson County, TX, 2008

Variety	Micronaire	Length	Uniformity	Strength	Elongation	Rd	+b	Leaf
AFD 5064F	3.55	1.08	80.3	28.5	10.2	81.7	7.95	2.5
AFD 5065B2F	3.40	1.10	79.6	28.9	10.8	83.0	7.65	2.0
AM 1532B2RF	2.90	1.11	79.3	25.6	9.9	83.3	8.45	1.0
AM 1550B2RF	3.05	1.07	79.3	26.2	10.2	81.8	8.90	1.0
AT EpicRF	3.20	1.07	79.9	26.4	10.9	82.7	8.80	1.0
CG 3035RF	3.05	1.07	79.4	26.6	10.6	82.4	8.85	1.5
CG 3220B2RF	3.10	1.09	79.2	26.0	10.4	82.5	8.65	1.5
DP 104B2RF	3.25	1.12	82.0	28.5	11.1	81.9	8.10	2.5
DP 141B2RF	2.75	1.10	78.9	28.0	9.6	82.1	8.30	2.0
DP 161B2RF	3.55	1.10	78.3	26.4	9.5	83.4	8.05	1.0
DP 164B2RF	3.00	1.09	77.0	26.5	9.2	82.9	8.40	1.5
DP 174RF	2.80	1.13	80.4	26.9	10.5	82.3	7.70	2.5
FM 1880B2F	2.95	1.10	79.0	28.8	9.4	83.8	8.15	1.0
FM 9058F	3.25	1.12	78.1	27.4	8.6	82.1	7.70	2.0
FM 9063B2F	3.25	1.13	80.1	29.3	9.4	84.3	7.65	1.0
FM 9180B2F	3.15	1.12	81.0	29.0	10.0	84.6	7.40	1.0
NG 3348B2RF	3.55	1.12	81.6	28.7	10.1	81.5	8.55	2.0
NG 3410RF	3.10	1.16	81.0	28.5	9.7	81.1	7.90	1.5
PG 315RF	3.20	1.03	78.4	25.5	9.4	81.4	8.90	1.5
PG 375WRF	3.35	1.03	78.3	25.3	9.7	82.0	8.45	1.5
PM 2141B2RF	3.50	1.10	80.4	27.5	10.0	78.4	7.40	4.0
ST 4498B2RF	3.00	1.11	81.5	28.7	11.7	82.2	8.70	1.5
ST 4554B2RF	3.15	1.10	80.5	28.7	11.5	81.2	9.15	2.0
ST 5283RF	3.00	1.06	79.5	27.8	10.2	81.5	8.95	2.0
ST 5327B2RF	3.00	1.08	79.9	27.5	10.1	80.8	8.50	2.5
ST 5458B2RF	3.30	1.10	79.6	27.7	9.9	80.9	8.65	2.5

Table 5. Ranking (by yield and net value) of cotton varieties tested in Fusarium wilt trials from 2007 and 2008*

Variety	Number of trials	Rank by yield	Rank by net value
AFD 5064F	3	10	10
AFD 5065B2F	4	20	19
All-Tex Apex B2RF	3	11	13
All-Tex Arid B2RF	2	29	29
All-Tex EpicRF	2	19	18
All-Tex Titan B2RF	3	17	16
Americot 1532B2RF	2	9	9
Americot 1550B2RF	2	28	28
Americot 1622B2RF	3	18	17
Americot 2220RF	2	30	30
Croplan Genetics 3035RF	2	25	25
Deltapine 104B2RF	2	4	4
Deltapine 143B2RF	3	5	5
Deltapine 147RF	3	24	24
Deltapine 161B2RF	2	12	11
Deltapine 164B2RF	3	3	3
Deltapine 167RF	3	23	22
Deltapine 174RF	4	1	1
FiberMax 1740B2F	2	33	33
FiberMax 1840B2F	2	7	7
FiberMax 1880B2F	4	15	15
FiberMax 9058F	2	31	31
FiberMax 9063B2F	4	21	20
FiberMax 9068F	2	14	14
FiberMax 9180B2F	3	22	21
NexGen 3410RF	2	8	8
PhytoGen 375WRF	2	32	32
PhytoGen 485WRF	3	27	27
Stoneville 4554B2RF	4	6	6
Stoneville 5327B2RF	2	16	23
Stoneville 5458B2RF	2	2	2
Stoneville 6611B2RF	2	26	26
Stoneville 6622RF	2	13	12

*** Shaded varieties have performed consistently well across years and/or locations**

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2008 Cotton Variety Performance under Verticillium Wilt Pressure

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Abstract

Verticillium wilt, caused by the soilborne fungus, *Verticillium dahliae*, is an economically important disease of cotton in Gaines County, Texas. *V. dahliae* has a broad range of hosts, including peanuts, which are rotated with cotton in Gaines County. The cotton and peanut rotation results in a yearly increase in the concentration of inoculum in the soil. The objectives of this research were to evaluate the performance of commercially available cotton varieties in fields with varying levels of *Verticillium dahliae* inoculum and compare the net returns between varieties in fields with high and low Verticillium wilt pressure. Field trials were conducted in Gaines County, TX in 2008 to evaluate eleven cotton varieties. Deltapine 174RF and 161B2RF performed consistently well in both trials; whereas, PhtyoGen 375WRF performed poorly in both trials. Variety selection is one of the most important decisions a producer must make. Verticillium wilt is one factor that can significantly impact variety performance. Continued evaluations of these varieties are needed.

Introduction

Verticillium wilt, caused by the soilborne fungus, *Verticillium dahliae*, is an economically important disease of cotton in Gaines County, Texas. Symptoms of Verticillium wilt include stunting, brown flecks in the xylem tissue of the stem, yellow mosaic pattern on leaves, and eventually defoliation (Kirkpatrick, 2001). As a result, fiber and seed quality is reduced (Kirkpatrick, 2001). Cooler (below 90°F) wet environmental conditions favor Verticillium wilt development in host plants (Kirkpatrick, 2001). Crop rotation with a non-host is not a feasible management option since microsclerotia of *V. dahliae* persist in the soil for many years (Kirkpatrick, 2001). Additionally, *V. dahliae* has a broad range of hosts, including peanuts (Kokalis-Burelle, 1997), which are rotated with cotton in Gaines County. The cotton and peanut rotation results in a yearly increase in the concentration of inoculum in the soil. Therefore, planting cotton varieties with improved resistance or tolerance to Verticillium wilt is the most effective tool in managing this disease. The objectives of this study were to evaluate eleven commercially available cotton varieties in fields with varying levels of *V. dahliae* inoculum and to compare net returns between varieties in fields with high and low Verticillium wilt pressure.

Materials and Methods

Field trials were conducted in Gaines County, TX in 2008. Trial 1 had a seeding rate of 4 seed per row-foot and was planted on 5 May with 4 lb of Temik 15G placed in the furrow at planting. Trial 2 had a seeding rate of 3.5 seed per row-foot and was planted on 15 May. No Temik 15G was applied. Plots had 40 and 38 inch row spacing, respectively. Both trials were irrigated using a pivot irrigation system. Plots were 8-rows wide and extended the length of the field. Eleven varieties were evaluated in each trial. Plots were arranged in a randomized complete block design with 3 replications. Within each test, the production practices were the same for all varieties. The initial infection propagule, microsclerotia (ms) obtained from soil sampled in April, averaged 47.5 and 1.5/cm3 soil for trials 1 and 2, respectively. Both fields were infested with the root-knot nematode (*Meloidogyne incognita*). Trial 1 and Trial 2 were harvested on 9 October and 11 November, respectively. On 24 October temperatures dropped below 30°F, resulting in slower maturation in Trial 2. All plots were weighed separately using a Lee weigh wagon. Sub-samples were taken from each plot. All sub-samples were weighed and then ginned using a sample gin with a lint cleaner, burr extractor and stick machine. Ginned lint was weighed and lint and seed turnouts were calculated. Lint and seed yield were determined by multiplying the respective turn out with field plot weights. Approximately 50 gram lint samples were randomly collected for fiber quality analysis. Fiber analysis was conducted by the Texas Tech University Fiber & Biopolymer Research Institute and Commodity Credit Corporation (CCC) lint loan values were determined for each plot. Leaf grade was set at 3 and color grade was set at 21 for all observations in Trial 1 to more closely reflect field average. Leaf grade and color grade were not set in Trial 2 since fiber analyses were similar to the field averages. Lint value was determined by multiplying the loan value with the lint yield. Seed value was determined using a value of $200/ton for seed. Ginning Cost was determined using $3.00/cwt ginning cost. Seed and technology cost was calculated using the 2008 Seed Cost Comparison Worksheet courtesy of the Plains Cotton Growers Inc. Net value was determined by adding lint value and seed value and subtracting ginning cost and seed fees and technology fees. Statistical analysis of data was conducted using SAS 9.1 for windows, using PROC GLM.

Results and Discussion

Extensive Verticillium wilt symptoms were observed by late July in Trial 1. A cool wet period occurred during the second week of September and soon after, defoliation was seen in 8 of the 11 varieties. DP 174RF, DP 161B2RF, and DP 141B2F retained foliage whereas all other varieties were defoliated by late September.

In Trial 1, lint yield ranged from 948 to 1341 lb/acre (average of 1110 lb lint/acre) (Table 1), while in Trial 2, lint yield ranged from 1143 to 1338 lb/acre (average of 1213 lb lint/acre) (Table 3). Verticillium wilt incidence was minimal in Trial 2 and did not impact yield (personal observation).

In Trial 1, net value ranged from $474 to $767/acre (difference of $293/acre) (Table 1), while in Trial 2, net value ranged from $615 to $747/acre (difference of $132/acre) (Table 3). Varieties that performed consistently in both trials included Deltapine 174RF and 161B2RF; whereas, Phytogen 375WRF performed poorly in both trials (Tables 1 and 3). Fibermax 1740B2RF ranked 9th of 11 varieties in Trial 1 (high pressure field), but had the 3rd highest net value in Trial 2 (low pressure field). NexGen 3348B2RF ranked 3rd in Trial 1, but had the lowest net value in Trial 2. Deltapine 141B2RF ranked 5th in Trial 1, but had the 2nd highest net value in Trial 2. Variety selection is one of the most important decisions a producer must make. Verticillium wilt is one factor that can significantly impact variety performance. Continued evaluations of these varieties are needed.

Acknowledgments

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Table 1. Harvest Results from Trial 1 planted in a field with an average inoculum level of 47.5 microsclerotia/cm^3 soil.

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 174RF	34.8	44.4	3842	1341	1706	0.5703	764.57	170.56	935.13	115.25	52.72	767.16 a
Deltapine 161B2RF	34.0	49.6	3627	1235	1800	0.5743	709.17	180.00	889.16	108.82	61.86	718.49 a
NexGen 3348B2RF	34.0	47.8	3407	1154	1625	0.5582	644.28	162.47	806.75	102.22	58.25	646.28 b
FiberMax 9180B2F	32.5	48.9	3456	1122	1686	0.5743	644.21	168.61	812.82	103.67	63.48	645.66 b
Deltapine 141B2RF	31.7	48.0	3684	1169	1767	0.5407	631.43	176.69	808.12	110.51	61.86	635.75 bc
FiberMax 9063B2F	32.9	50.0	3316	1086	1653	0.5737	622.95	165.33	788.27	99.47	63.48	625.32 bc
PhytoGen 485WRF	31.8	48.0	3355	1064	1611	0.5568	592.53	161.14	753.67	100.66	61.16	591.85 bcd
Americot 1532B2RF	31.6	47.2	3274	1034	1543	0.5633	582.48	154.27	736.75	98.23	60.29	578.23 cd
FiberMax 1740B2F	34.4	46.0	3179	1088	1456	0.5095	554.60	145.59	700.19	95.38	63.48	541.33 d
PhytoGen 375WRF	33.8	44.2	2882	972	1271	0.5092	494.56	127.13	621.69	86.45	61.16	474.08 e
FiberMax 1880B2F	32.0	48.4	2965	948	1436	0.5082	482.42	143.58	626.00	88.94	63.48	473.57 e
Test average	33.0	47.5	3362	1110	1596	0.5490	611.20	159.58	770.78	100.87	61.02	608.89
CV, %	3.8	2.1	4.2	5.0	3.7	1.7	5.3	3.7	4.8	4.2	--	5.7
OSL	0.0282	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001
LSD	2.1	1.7	240	94	100	0.0159	55.26	10.01	63.23	7.19	--	59.31

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

Assumes:
$3.00/cwt ginning cost.
$200/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 Trial 1 planted in a field with an average inoculum level of 47.5 microsclerotia/cm^3 soil.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Rd	+b
	units	32^{nds} inches	%	g/tex	%	reflectance	yellowness
Americot 1532B2RF	3.6	36.3	79.9	27.2	10.1	76.8	7.9
Deltapine 141B2RF	3.3	36.6	79.8	29.6	9.5	77.2	7.5
Deltapine 161B2RF	3.7	38.1	81.7	30.5	9.2	79.0	7.5
Deltapine 174RF	3.9	36.8	81.2	27.5	10.1	75.8	8.0
FiberMax 1740B2F	3.3	34.3	79.2	27.9	10.1	80.4	7.2
FiberMax 1880B2F	3.0	35.3	78.8	28.9	9.8	80.5	6.9
FiberMax 9063B2F	3.8	37.5	80.9	30.4	9.1	79.4	7.0
FiberMax 9180B2F	3.7	37.1	80.8	31.1	9.4	78.1	6.8
NexGen 3348B2RF	3.6	35.5	81.2	29.0	9.8	74.8	7.5
PhytoGen 375WRF	3.2	34.2	79.9	27.3	10.0	77.0	7.5
PhytoGen 485WRF	3.8	35.2	81.1	29.0	11.2	75.7	7.7
Test average	3.5	36.1	80.4	28.9	9.8	77.7	7.4
CV, %	4.1	1.3	0.8	2.6	1.8	1.9	2.8
OSL	<0.0001	<0.0001	0.0004	<0.0001	<0.0001	0.0008	<0.0001
LSD	0.2	0.8	1.2	1.3	0.3	2.5	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.

Leaf set at 3 for all observations to more closely reflect field average.
Color grade set at 21 for all observations to more closely reflect field average.

Table 3. Harvest results from Trial 2 planted in a field with an average inoculum level of 1.5 microsclerotia/cm^3 soil.

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	47.6	3870	1338	1844	0.5443	727.48	184.39	911.87	116.12	48.56	747.19 a
Deltapine 141B2RF	33.3	52.0	3855	1284	2005	0.5575	716.06	200.54	916.60	115.66	56.98	743.96 a
FiberMax 1740B2F	36.2	50.1	3533	1279	1768	0.5560	711.77	176.85	888.62	105.99	58.47	724.16 ab
Deltapine 161B2RF	32.2	51.6	3773	1214	1947	0.5698	691.20	194.68	885.87	113.19	56.98	715.71 abc
FiberMax 9180B2F	33.3	52.5	3495	1164	1835	0.5725	666.43	183.43	849.85	104.86	58.47	686.52 bcd
PhytoGen 485WRF	31.9	51.8	3666	1170	1896	0.5553	649.84	189.66	839.50	109.99	56.33	673.17 bcd
FiberMax 1880B2F	32.7	51.0	3696	1209	1885	0.5400	653.21	188.50	841.71	110.88	58.47	672.36 cd
FiberMax 9063B2F	32.3	51.9	3537	1143	1835	0.5653	646.20	183.46	829.65	106.11	58.47	665.07 cde
PhytoGen 375WRF	36.4	49.3	3367	1224	1660	0.5300	649.48	165.99	815.46	101.03	56.33	658.11 de
Americot 1532B2RF	32.2	50.6	3648	1174	1844	0.5393	631.94	184.44	816.39	109.46	55.54	651.40 de
NexGen 3348B2RF	33.5	51.9	3427	1148	1777	0.5173	593.93	177.64	771.57	102.80	53.65	615.13 e
Test average	33.5	50.9	3625	1213	1845	0.5498	667.05	184.51	851.55	108.73	56.20	686.62
CV, %	2.1	1.8	2.7	3.7	3.0	3.2	4.4	3.0	3.8	2.7	--	4.4
OSL	<0.0001	<0.0001	<0.0001	0.0004	<0.0001	0.0241	0.0004	<0.0001	0.0004	<0.0001	--	0.0005
LSD	1.2	1.5	169	77	94	0.0304	49.43	9.39	54.52	5.06	--	51.72

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.
$200/ton for seed.
Value for lint based on CCC loan value from grab samples and FBRI HVI results.

Table 4. HVI fiber property results from Trial 2 planted in a field with an average inoculum level of 1.5 microsclerotia/cm^3 soil.

Entry	Micronaire	Staple	Uniformity	Strength	Elongation	Leaf	Rd	+b	Color grade	
	units	32^{nds} inches	%	g/tex	%	grade	reflectance	yellowness	color 1	color 2
Americot 1532B2RF	3.9	34.7	78.0	26.4	10.1	1.3	80.5	7.8	2.3	1.0
Deltapine 141B2RF	3.6	35.7	78.4	28.8	9.5	2.7	79.9	8.0	2.7	1.0
Deltapine 161B2RF	4.0	36.3	79.8	28.9	9.3	2.0	80.5	7.9	2.0	1.0
Deltapine 174RF	3.7	34.6	78.5	26.2	10.3	2.3	78.2	8.8	2.3	1.0
FiberMax 1740B2F	4.0	34.5	80.3	27.9	9.7	1.7	79.9	8.4	2.3	1.0
FiberMax 1880B2F	3.5	34.5	78.3	28.8	9.3	2.0	79.9	8.0	2.3	1.0
FiberMax 9063B2F	3.9	35.9	78.9	29.6	9.2	2.3	81.5	7.8	2.0	1.0
FiberMax 9180B2F	4.2	36.3	81.2	29.9	9.2	2.3	80.7	7.7	2.3	1.0
NexGen 3348B2RF	3.9	33.9	79.3	27.3	9.4	3.0	75.5	9.7	3.0	1.7
PhytoGen 375WRF	3.7	33.7	79.5	27.6	9.8	2.0	79.2	8.1	3.0	1.0
PhytoGen 485WRF	4.1	35.1	82.1	29.5	11.3	3.3	77.7	8.3	3.0	1.0
Test average	3.9	35.0	79.5	28.3	9.7	2.3	79.4	8.2	2.5	1.1
CV, %	4.4	1.9	1.3	2.5	2.4	31.0	1.0	5.2	--	--
OSL	0.0010	0.0006	0.0019	<0.0001	<0.0001	0.0917	<0.0001	0.0007	--	--
LSD	0.3	1.1	1.8	1.2	0.4	NS	1.3	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, NS - not significant.

2008 Sites Planted but Lost Due to Weather

Muleshoe Irrigated Picker/Stripper Systems Variety Demonstration - 2008

Exp. Unit #			
1	FM 9058F----------fill----------9058F		
2	P	AT Summit B2RF	Rep I
3	S	AT Summit B2RF	
4	S	DP 121RF	
5	P	DP 121RF	
6	S	FM 9058F	
7	P	FM 9058F	
8	P	FM 9180B2F	
9	S	FM 9180B2F	
10	P	ST 4498B2RF	
11	S	ST 4498B2RF	
12	S	PHY 375WRF	
13	P	PHY 375WRF	
14	P	DP 121RF	Rep II
15	S	DP 121RF	
16	P	FM 9180B2F	
17	S	FM 9180B2F	
18	S	AT Summit B2RF	
20	P	AT Summit B2RF	
21	S	FM 9058F	
22	P	FM 9058F	
24	P	PHY 375WRF	
25	S	PHY 375WRF	
26	S	ST 4498B2RF	
27	P	ST 4498B2RF	
29	P	PHY 375WRF	Rep III
30	S	PHY 375WRF	
31	P	FM 9058F	
32	S	FM 9058F	
33	P	ST 4498B2RF	
34	S	ST 4498B2RF	
35	S	DP 121RF	
36	P	DP 121RF	
37	S	FM 9180B2F	
38	P	FM 9180B2F	
39	P	AT Summit B2RF	
40	S	AT Summit B2RF	
41	FM 9058F----------fill----------9058F		
42	FM 9058F----------fill----------9058F		
43	FM 9058F----------fill----------9058F		
44	FM 9058F----------fill----------9058F		
45	FM 9058F----------fill----------9058F		

Variety	Acres		
AT Summit B2RF	8.7	626400	2.8
DP 121RF	9.3	669600	2.7
FM 9058F	9.2	662400	3.3
FM 9180B2F	8.8	633600	3.2
ST 4498B2RF	8.8	633600	2.8
PHY 375WRF	9.2	662400	2.9

Planting date 5/10/2008
Seeding rate 73K/acre

Insecticide 3.75 #/acre Temik
Herbicide 1 pt/acre Direx

Fertilizer

Temp @ planting 75 F/86 F (10:45am/5:00pm)

All fills planted to FM 9058F

12-row plots on 30-inch centers

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

Plains Irrigated Picker/Stripper Systems Variety Demonstration - 2008

Rep I	20E	NG 3348B2RF		Rep III	20E	AT 65333 RF	
	19E	CG 3220B2RF			19E	DP 174RF	
	18E	DG 2570B2RF			18E	NG 3410RF	
	17E	DP 0935B2RF			17E	FM 9058F	Stripper
	16E	FM 1740B2F			16E	FM 9058F	Picker
	15E	BCSX4366B2F			15E	ST 4498B2RF	Picker
	14E	ST 4554B2RF			14E	ST 4498B2RF	Stripper
	13E	AT Summit B2RF	Picker		13E	PHY 375WRF	Stripper
	12E	AT Summit B2RF	Stripper		12E	PHY 375WRF	Picker
	11E	PHY 375WRF	Stripper		11E	FM 9180B2F	Picker
	10E	PHY 375WRF	Picker		10E	FM 9180B2F	Stripper
	9E	FM 9180B2F	Stripper		9E	AT Summit B2RF	Picker
	8E	FM 9180B2F	Picker		8E	AT Summit B2RF	Stripper
	7E	ST 4498B2RF	Picker		7E	DG 2570B2RF	
	6E	ST 4498B2RF	Stripper		6E	BCSX4366B2F	
	5E	FM 9058F	Picker		5E	FM 1740B2F	
	4E	FM 9058F	Stripper		4E	NG 3348B2RF	
	3E	NG 3410RF			3E	ST 4554B2RF	
	2E	AT 65333 RF			2E	CG 3220B2RF	
	1E	DP 174RF			1E	DP 0935B2RF	NO TEMIK
Through "0"							

Rep II	1W	DG 2570B2RF	
	2W	FM 1740B2F	
	3W	ST 4554B2RF	
	4W	CG 3220B2RF	
	5W	BCSX4366B2F	
	6W	NG 3348B2RF	
	7W	DP 0935B2RF NO TEMIK	
	8W	PHY 375WRF	Picker
	9W	PHY 375WRF	Stripper
	10W	ST 4498B2RF	Stripper
	11W	ST 4498B2RF	Picker
	12W	AT Summit B2RF	Stripper
	13W	AT Summit B2RF	Picker
	14W	FM 9180B2F	Picker
	15W	FM 9180B2F	Stripper
	16W	FM 9058F	Stripper
	17W	FM 9058F	Picker
	18W	NG 3410RF	
	19W	DP 174RF	
	20W	AT 65333 RF	

	Variety List	B2Flex	Flex
1	NG 3348B2RF	1	
2	CG 3220B2RF	2	
3	DG 2570B2RF	3	
4	DP 0935B2RF	4	
5	FM 1740B2F	5	
6	BCSX4366B2F	6	
7	ST 4554B2RF	7	
8	AT Summit B2RF	8	
9	PHY 375WRF	9	
10	FM 9180B2F	10	
11	ST 4498B2RF	11	
12	FM 9058F		1
13	NG 3410RF		2
14	AT 65333 RF		3
15	DP 174RF		4
Planting date		5/23/2008	

Blanco Dryland Systems Variety Demonstration - 2008

Fill		
Rep I	NG 3410RF	
	AT 65333 RF	
	DP 174RF	
	FM 9058F	
	PHY 315RF	
	NG 3348B2RF	
	AT Apex B2RF	
	CG 3220B2RF	
	ST 4498B2RF	
	DP 164B2RF	
	FM 9180B2F	
	BCSX4366B2F	
	DP 161B2RF	
	ST 5327B2RF	
	PHY 375WRF	
Rep II	DP 161B2RF	
	CG 3220B2RF	
	ST 4498B2RF	
	PHY 375WRF	
	AT 65333 RF	
	DP 174RF	
	FM 9058F	
	NG 3410RF	
	PHY 315RF	
	DP 164B2RF	
	AT Apex B2RF	
	FM 9180B2F	
	ST 5327B2RF	
	BCSX4366B2F	
	NG 3348B2RF	
Rep III	ST 5327B2RF	
	NG 3348B2RF	
	DP 164B2RF	
	BCSX4366B2F	
	CG 3220B2RF	
	PHY 375WRF	
	ST 4498B2RF	
	FM 9180B2F	
	DP 161B2RF	
	AT Apex B2RF	
	FM 9058F	
	NG 3410RF	
	PHY 315RF	
	DP 174RF	
	AT 65333 RF	
Fill		

Variety	RRF	B2RF
NG 3410RF	1	
AT 65333 RF	2	
DP 174RF	3	
FM 9058F	4	
PHY 315RF	5	
NG 3348B2RF		1
AT Apex B2RF		2
CG 3220B2RF		3
DP 161B2RF		4
DP 164B2RF		5
FM 9180B2F		6
BCSX4366B2F		7
ST 4498B2RF		8
ST 5327B2RF		9
PHY 375WRF		10

Planting date	5/21/2008
Planting rate	42 K/acre
Plot size	8 rows X 2482' 1.52 acres/plot

4.55 acres/variety

Plains Dryland Variety Demonstration - 2008

Border Fill - 1					
Start 1==>	Rep III	AFD 5065B2F	2	1==>	
		AT 65333RF			
<==End 4		CG 4020B2RF	3	<==4	
		DP 174RF			
<==End 2		FM 1740B2F	4	<==2	
		NG 3410RF			
Start 3==>		PHY 375WRF	5	3==>	
		ST 5458B2RF			
4==>	Rep II	DP 174RF	6	4==>	
		CG 4020B2RF			
<==3		ST 5458B2RF	7	<==3	N==>
		PHY 375WRF			
<==1		AT 65333RF	8	<==1	
		AFD 5065B2F			
2==>		NG 3410RF	9	2==>	
		FM 1740B2F			
1==>	Rep I	AFD 5065B2F	10	End 1==>	
		AT 65333RF			
<==2		FM 1740B2F	11	<==Start 2	
		NG 3410RF			
3==>		PHY 375WRF	12	End 3==>	
		ST 5458B2RF			
<==4		CG 4020B2RF	13	<==Start 4	
		DP 174RF			
Border Fill - 14					
2008 Plains Dryland Systems					

	Variety	RACE
1	AFD 5065B2F	1
2	AT 65333RF	2
3	CG 4020B2RF	3
4	DP 174RF	4
5	FM 1740B2F	5
6	NG 3410RF	6
7	PHY 375WRF	7
8	ST 5458B2RF	8

Date of Planting	16-May
Seeding Rate	3.2 seed/row ft
Insecticide	2.5 lb/a Temik
Herbicide	1.0 pt/acre Treflan PPI
	4.0 oz/acre Treflan @ planting
	0.2 oz/acre Staple @ planting

Plains Dryland Systems Variety Demonstration - 2008

RACE Demonstration (West Side)				
Border Fill - 14				
Start 1==>	Rep III	AT Summit B2RF	15	1==>
		BCSX4366B2F		
<==End 4		DP 0935B2RF	16	<==4
		FM 1880B2F		
Start 5==>		NG 3348B2RF	17	5==>
		DP 164B2RF		
6==>		ST 4498B2RF	18	End 6==>
		FM 9180B2F		
Start 3==>		CG 3035RF	19	3==>
		DG 2400RF		
<==End 2		FM 9058F	20	<==2
		PHY 315RF		
<==6	Rep II	FM 9180B2F	21	<==6
		ST 4498B2RF		
<==5		DP 164B2RF	22	<==5
		NG 3348B2RF		
<==3		DG 2400RF	23	<==3
		CG 3035RF		
<==1		BCSX4366B2F	24	<==1
		AT Summit B2RF		
4==>		FM 1880B2F	25	4==>
		DP 0935B2RF		
2==>		PHY 315RF	26	2==>
		FM 9058F		
5==>	Rep I	NG 3348B2RF	27	End 5==>
		DP 164B2RF		
<==6		ST 4498B2RF	28	<==Start 6
		FM 9180B2F		
1==>		AT Summit B2RF	29	End 1==>
		BCSX4366B2F		
<==2		FM 9058F	30	<==Start 2
		PHY 315RF		
3==>		CG 3035RF	31	End 3==>
		DG 2400RF		
<==4		DP 0935B2RF	32	<==Start 4
		FM 1880B2F		
Border Fill - 33				
CAP Plots (East Side)				

N==>

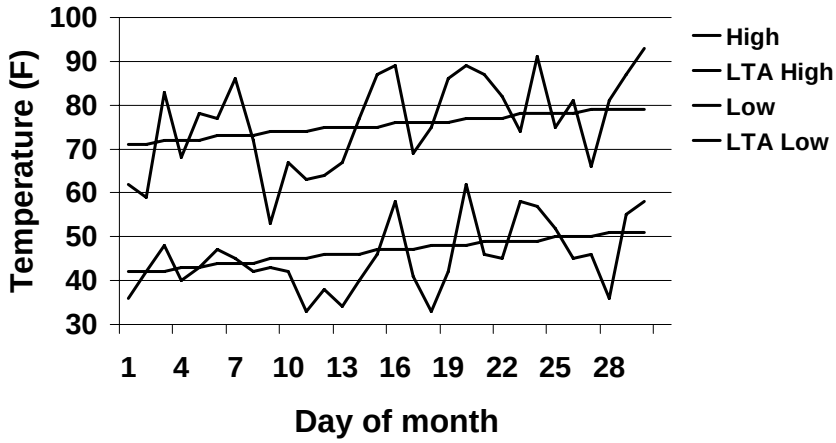
	Variety	Systems
1	AT Summit B2RF	1
2	BCSX4366B2F	2
3	DP 0935B2RF	3
4	FM 1880B2F	4
5	NG 3348B2RF	5
6	DP 164B2RF	6
7	ST 4498B2RF	7
8	FM 9180B2F	8
9	CG 3035RF	9
10	DG 2400RF	10
11	FM 9058F	11
12	PHY 315RF	12

6 row plots
12 row throughs
5/16/2008

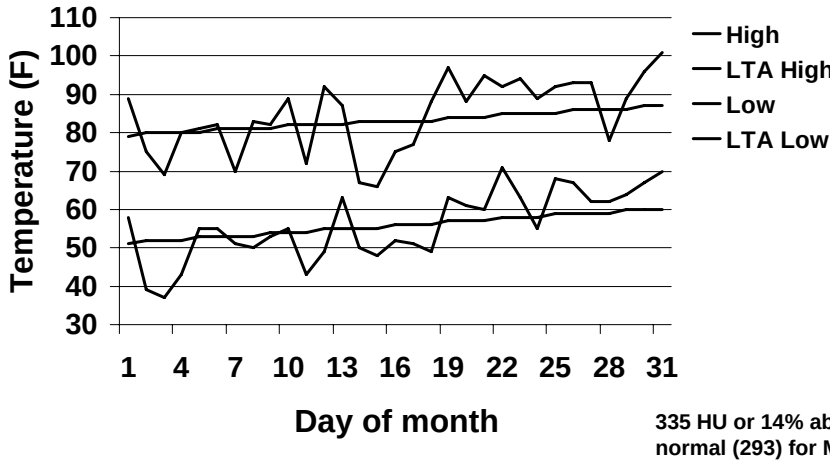
Date of Planting	**16-May**
Seeding Rate	**3.2 seed/row ft**
Insecticide	**2.5 lb/a Temik**
Herbicide	**1.0 pt/acre Treflan PPI**
	4.0 oz/acre Treflan @ planting
	0.2 oz/acre Staple @ planting

2008 Lubbock Weather and Crop Information

Lubbock Air Temperatures
April, 2008

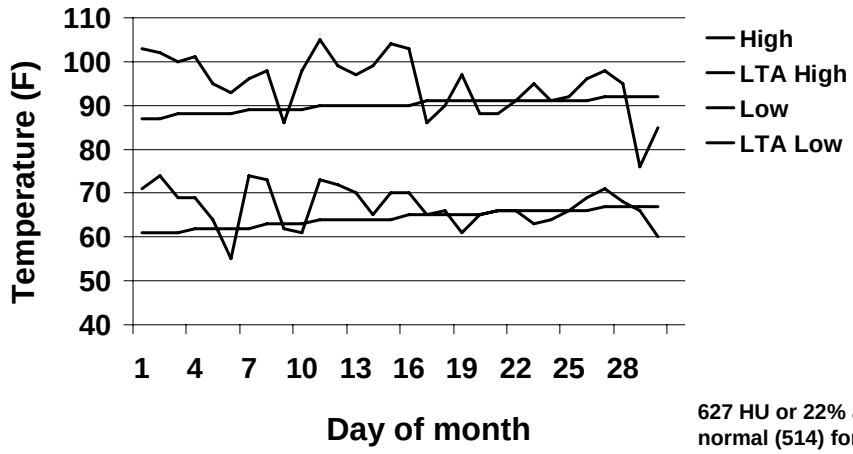


Lubbock Air Temperatures
May, 2008



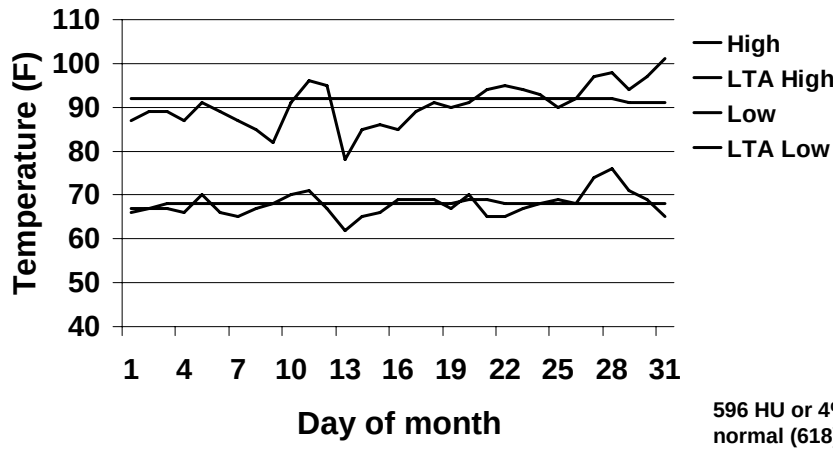
335 HU or 14% above normal (293) for May

Lubbock Air Temperatures
June, 2008



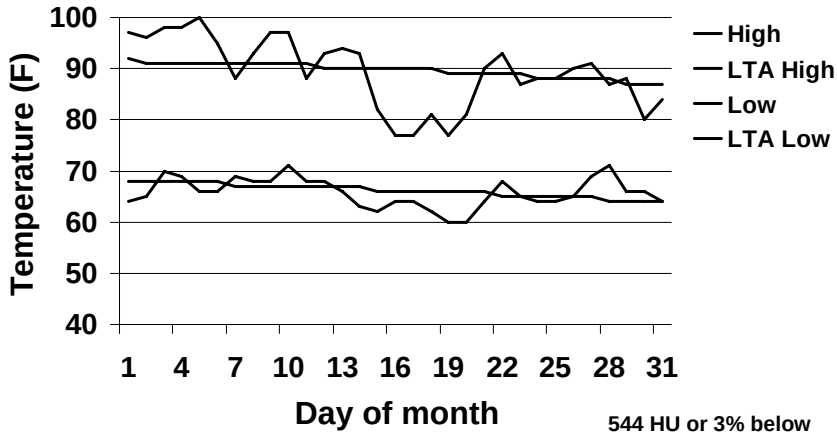
627 HU or 22% above normal (514) for June

Lubbock Air Temperatures
July, 2008



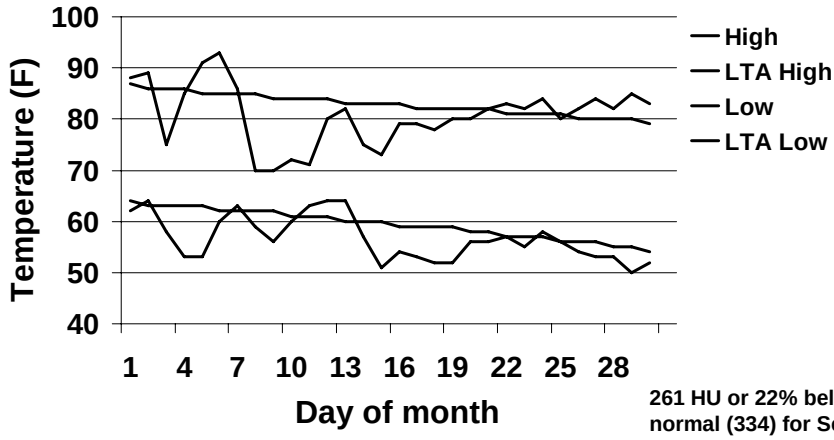
596 HU or 4% below normal (618) for July

Lubbock Air Temperatures
August, 2008



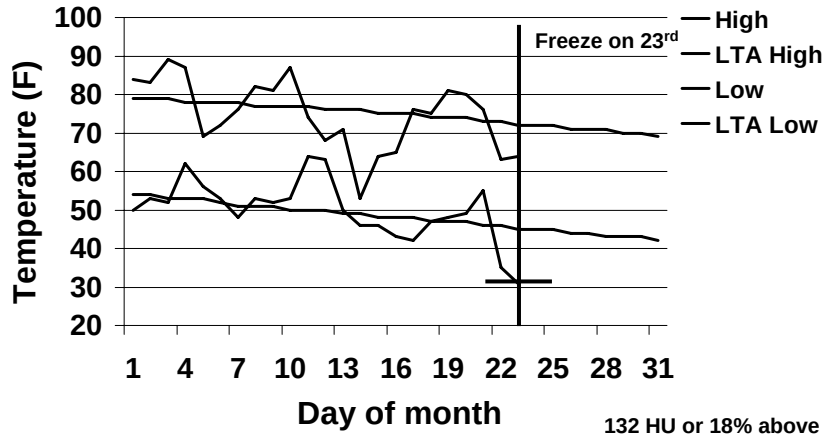
544 HU or 3% below normal (555) for August

Lubbock Air Temperatures
September, 2008



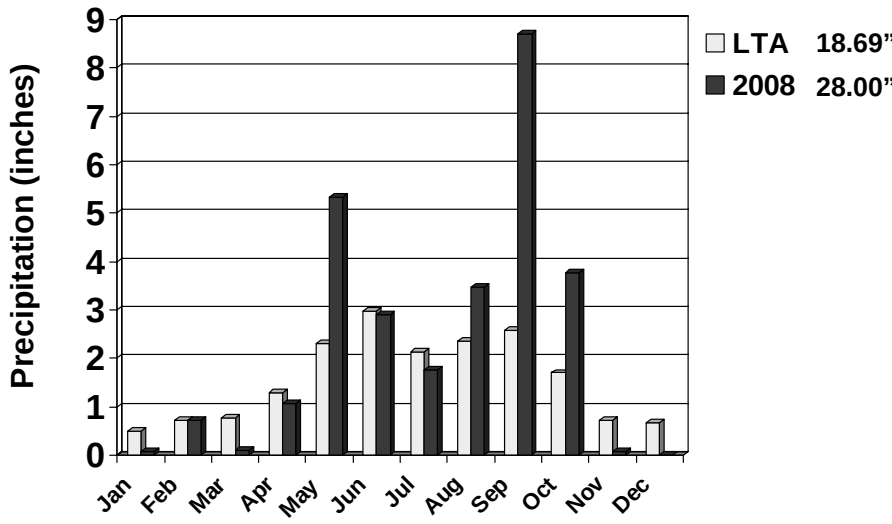
261 HU or 22% below normal (334) for September

Lubbock Air Temperatures October, 2008



132 HU or 18% above normal (112) for October 1-22

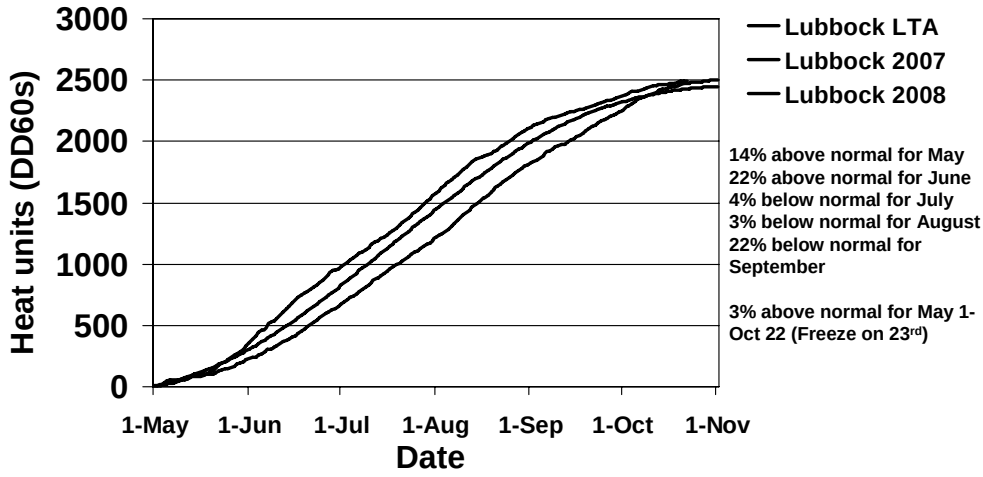
Lubbock LTA (1971-2000) vs. 2008 Rainfall



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

8.70” for September
3.77” for October 1-21

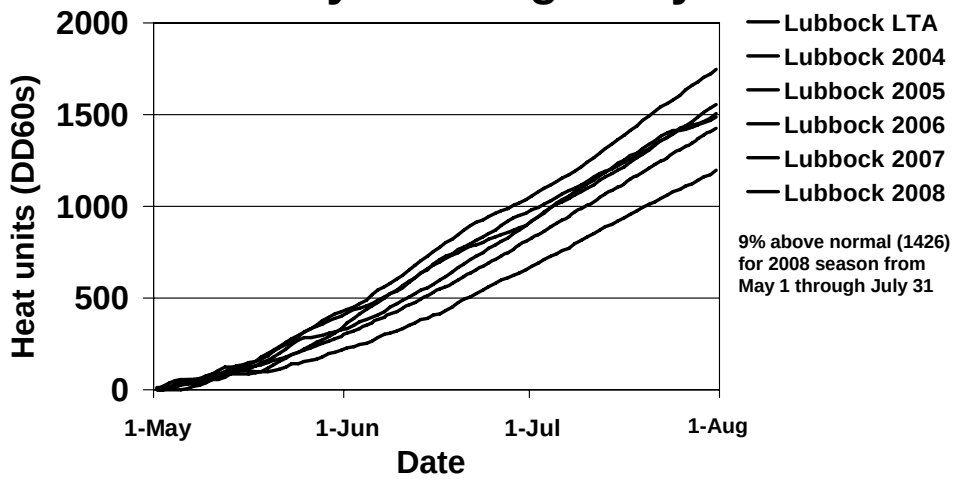
Lubbock 30-Yr Long Term Average (1971-2000) vs. 2007 and 2008 Cotton Heat Unit Accumulation



14% above normal for May
22% above normal for June
4% below normal for July
3% below normal for August
22% below normal for September

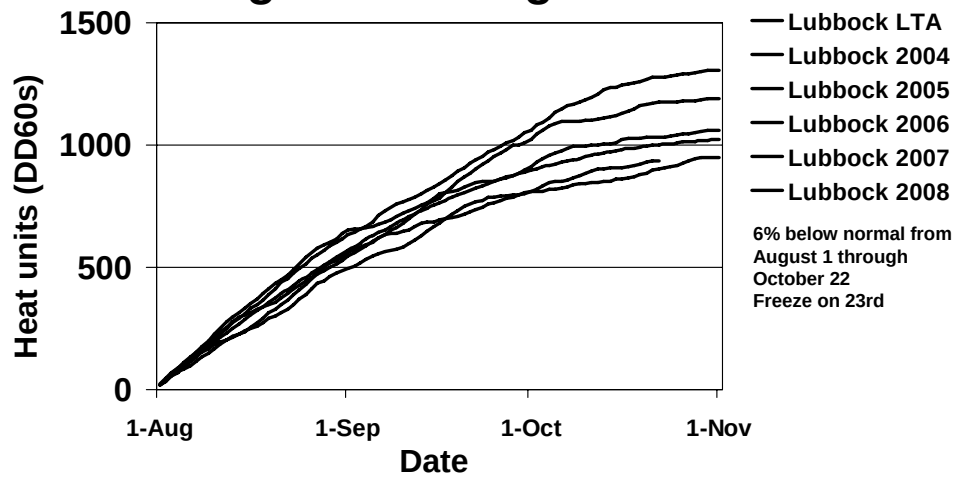
3% above normal for May 1-Oct 22 (Freeze on 23rd)

Lubbock 30-Yr Long Term Average (1971-2000) vs. 2004, 2005, 2006, 2007, and 2008 Cotton Heat Unit Accumulation From May 1 through July 31

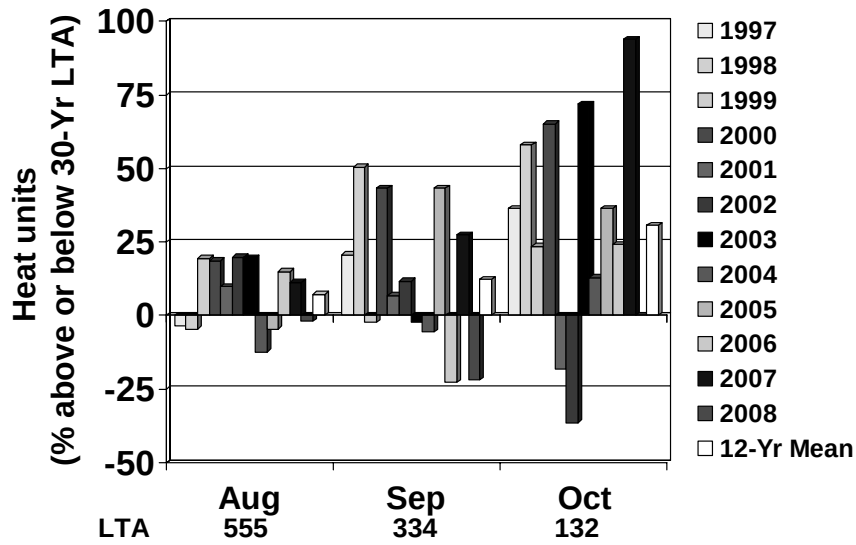


9% above normal (1426) for 2008 season from May 1 through July 31

Lubbock 30-Yr Long Term Average (1971-2000) vs. 2004, 2005, 2006, 2007 and 2008 Cotton Heat Unit Accumulation From August 1 through October 31



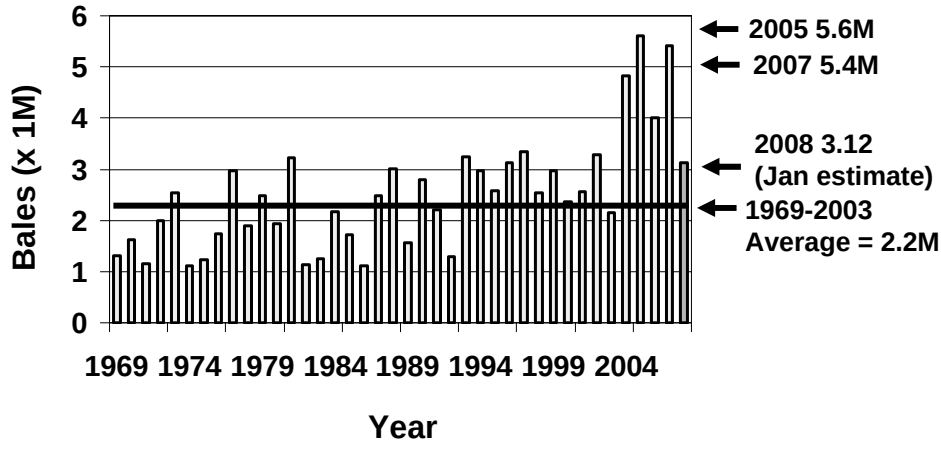
Percent of 30-Yr LTA Heat Unit Accumulation by Month for Lubbock



2008 Crop?

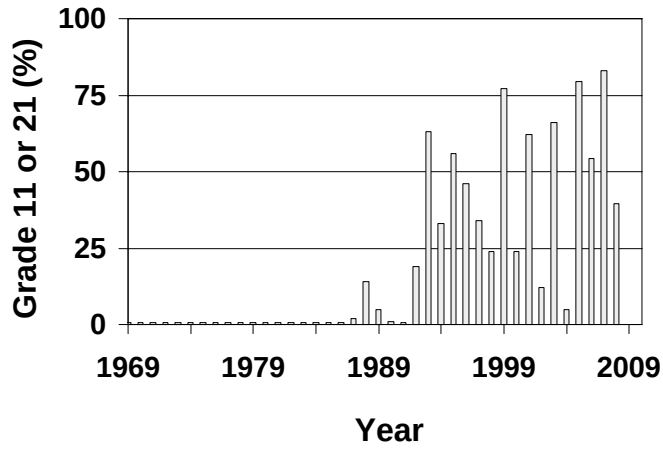
- If TASS estimates hold up, we will harvest 3.12 million bales in 1N and 1S
  - Smallest crop since 2003 which was at 2.15 million bales
- Only 40% color grades 11 or 21
  - Significantly lower than 2007 at 83%
- Average leaf higher than in the past several years
- It appears we are on track to have ***record length and strength***.
  - Record for staple at 36.8 32nds inch, with 67% 37 or longer
  - Record strength at 29.73 g/tex
- Micronaire continues to be a major problem at 3.63
  - 39% was 3.4 or lower, 24% 3.2 or lower
- Bark contamination at 60%, the highest since 1991

High Plains (TASS 1N and 1S) Total Bale Production 1969-2008



Source: USDA-AMS

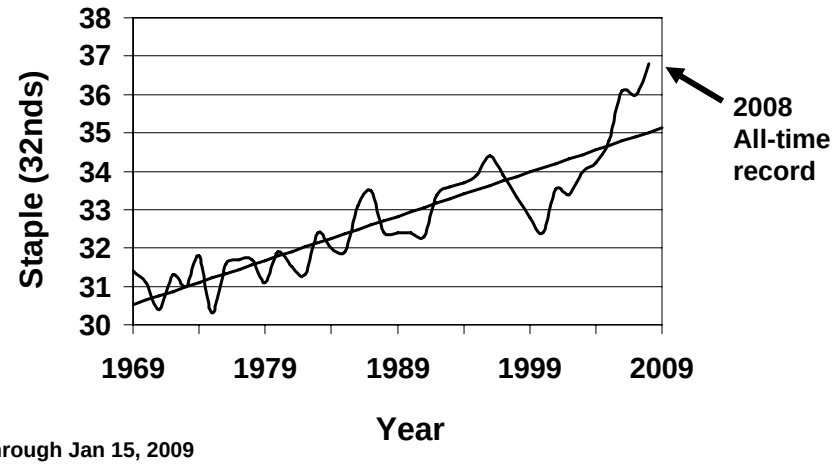
High Plains Color Grades 11 or 21 1969-2008



Source: USDA-AMS

2008 Through Jan 15, 2009

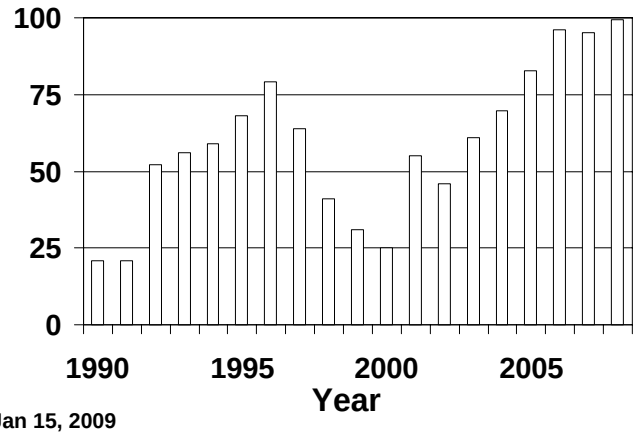
High Plains Average Staple 1969-2008



2008 Through Jan 15, 2009

Source: USDA-AMS

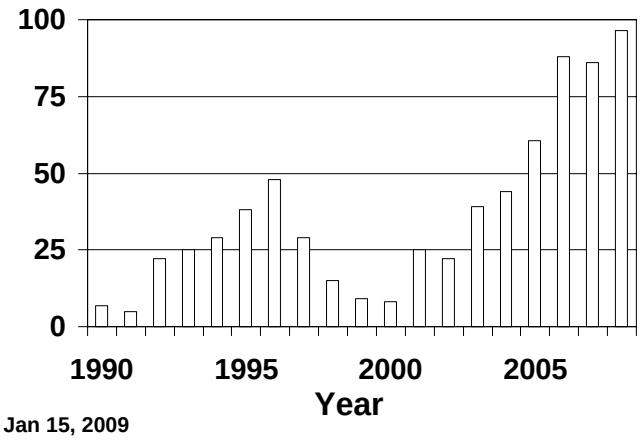
Percent of High Plains Bales with ≥34 Staple 1990-2008



2008 Through Jan 15, 2009

Source: USDA-AMS

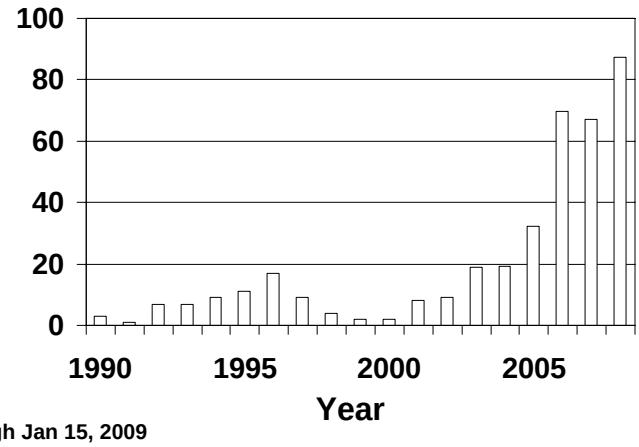
Percent of High Plains Bales with ≥35 Staple 1990-2008



2008 Through Jan 15, 2009

Source: USDA-AMS

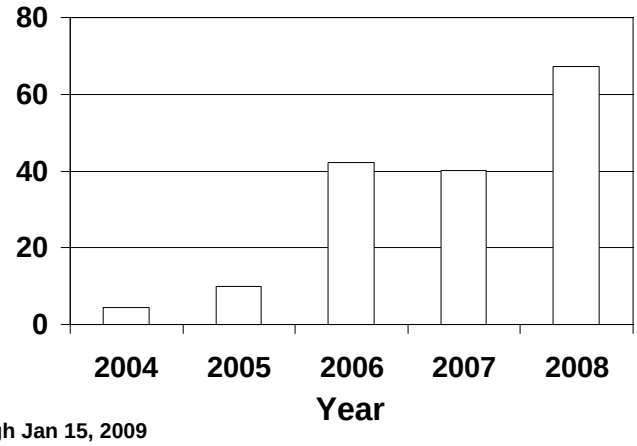
Percent of High Plains Bales with ≥36 Staple 1990-2008



2008 Through Jan 15, 2009

Source: USDA-AMS

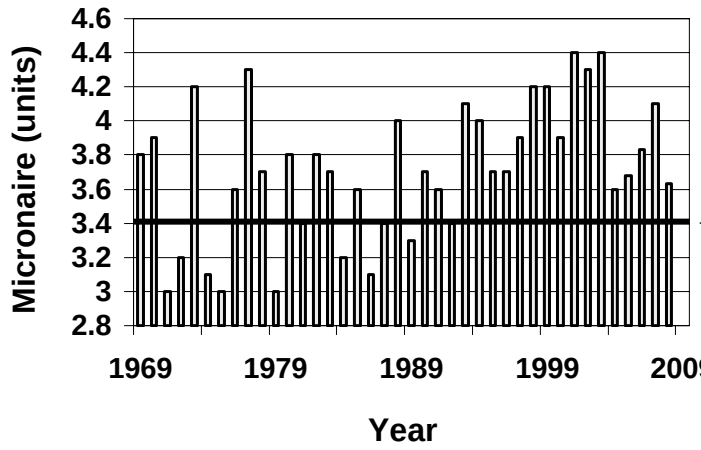
Percent of High Plains Bales with ≥37 Staple 2005-2008



2008 Through Jan 15, 2009

Source: USDA-AMS

High Plains Micronaire 1969-2008 (40 Years)



Number of Years	
≤ 3.4	11
≥ 4.0	11

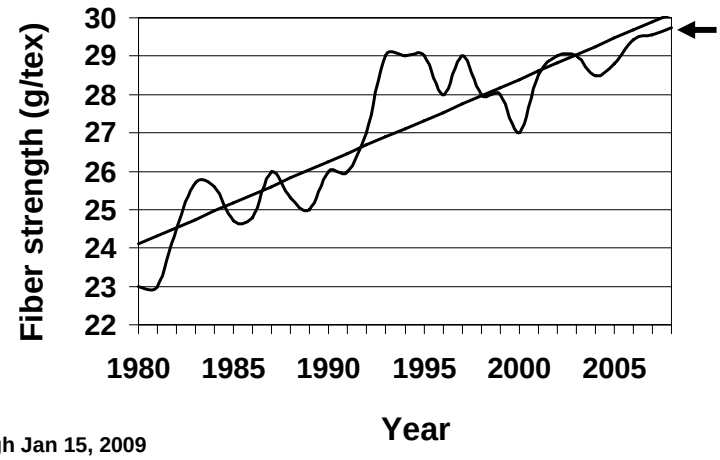
← Low mic discount

2008 % Below	
≤ 3.4	38.7
≤ 3.2	24.0

Source: USDA-AMS

2008 Through Jan 15, 2009

High Plains Average Fiber Strength 1980-2008

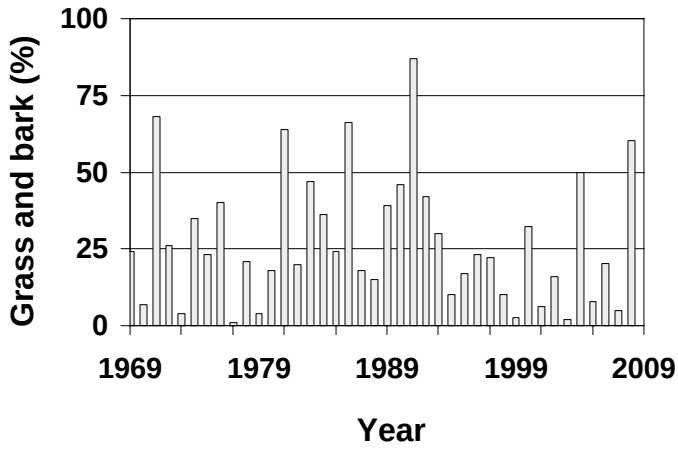


← 2007 was a record, 2008 is also!

2008 Through Jan 15, 2009

Source: USDA-AMS

High Plains Grass and Bark 1969-2008



Source: USDA-AMS

2008 Through Jan 15, 2009

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.