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

February, 2005

Dr. Randy Boman, Extension Agronomist-Cotton
Mr. Mark Kelley, Extension Program Specialist-Cotton
Mr. Mark Stelter, Extension Assistant-Cotton

Texas Cooperative Extension
Lubbock, TX

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. Current small-plot variety testing programs are generally 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 various transgenic cotton varieties when compared to conventional types in producers' fields. Three replications of each variety were included at each location. Plot size was of sufficient size to enable the combining of all replications of each individual variety into a single module at harvest. Each individual variety had at least three acres total (approximately one acre per plot with three replications equals three acres total). Plot weights were determined at harvest using a boll buggy equipped with integral electronic scales. Modules were followed through the commercial ginning process to determine lint turnout, USDA-AMS fiber quality, and CCC Loan value. Expenses for each herbicide system (Roundup Ready, Liberty Link and conventional) were tracked. Three producer-cooperator locations were utilized for this project. Trials were planted in Parmer, Crosby, and Yoakum counties.

In 2004, a year characterized by reduced heat units, especially further north in the High Plains, and generally substantially above average rainfall, some important variety differences were noted. Fall weather was cooler than the region experienced over the last several years, and high rainfall and some snow fall resulted in significant preharvest losses for looser varieties. After experiencing these weather conditions, picker type varieties still performed very well at some locations. Although these sites did encounter wet snowfall, and fairly high wind and rainfall intensities at times, the most important concern was the fact that these trials did not receive sleet or extremely high wind storms. Results from varying locations in the Texas High Plains indicate that some transgenic varieties were competitive with conventional types in terms of production economics. Picker varieties tended to produce lower micronaire lint than some stripper types, attributed to later maturity and a cooler growing season. These data indicate that substantial differences can be obtained in terms of net value/acre due to variety selection. The differences in net value/acre when comparing the top and bottom varieties were $174, $155, and $217/acre for Parmer, Crosby, and Yoakum counties, respectively. 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 4 years, High Plains cotton producers have increased planted acres of transgenic cottons (Roundup-herbicide tolerant and Bt insect-resistant types) from approximately 300 thousand in 1997 to approximately 2 million in 2001. Industry continues to increase the number of herbicide-tolerant, insect-resistant, and "stacked gene" varieties. The proliferation of transgenic varieties in the marketplace for 2001 was substantial and is expected to continue over the next few years. New transgenic varieties were marketed in the High Plains by numerous seed companies in 2004. 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 "stacked" Bt gene (Bollgard II) system from Monsanto was also available in a limited number of varieties in 2004. Varieties containing Monsanto's Roundup Ready Flex gene system are anticipated to be increased in 2005, with commercialization targeted for 2006. Additional Bt technologies, including VipCot and Widestrike are anticipated in the near future. 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 various transgenic cotton varieties when compared to conventional types in producers' fields in the Texas High Plains.

Materials and Methods

For scientific validity, 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 = three acres total). A forced randomization was used at each location. This was a requirement due to the potential for drift of Roundup WeatherMax and/or Ignite herbicide to adjacent non-herbicide tolerant varieties. For example, the Roundup Ready varieties were planted in a contiguous block,

with a fill variety between the next herbicide system. Varieties within the next herbicide system were then planted, with a fill variety between the last system. Varieties were randomized in each replication and herbicide system, but the forced randomization due to herbicide system was maintained. All fill varieties were treated with conventional herbicides and were not used for data acquisition.

Preplant incorporated and/or preemergence herbicide applications were made at the discretion of the producer-cooperator. Broadcast over-the-top herbicide applications were made using project equipment and project personnel or by the cooperator. Strike-Zone ammonium sulfate/drift retardant was used with broadcast Roundup WeatherMax applications in order to reduce drift potential to non-Roundup Ready varieties. Due to the fact that Strike Zone is rather expensive ($3.50/acre), cost for basic ammonium sulfate ($0.31/acre) was used to determine Roundup Ready systems costs. Post-directed herbicide applications were made by the producer-cooperator with the guidance of project personnel. Weed species spectrum was determined by project personnel working with the cooperator. Control of weed escapes (hoeing and/or spot spraying) was performed by project personnel and cooperator employees and records were kept by herbicide system to facilitate economic analysis.

In-season plant mapping data were derived from mapping 6 representative plants/plot. Plot weights were determined at harvest using a boll buggy with integral electronic scales and grab samples were obtained from each plot. Modules were followed through the ginning process to determine lint turnout, USDA-AMS fiber quality, and Loan value. Ginners were asked to gin each module separately and to tie off any remnant bales obtained in the ginning process in order to determine more precisely the turnout and lint yields. Data were then converted to a per acre basis and appropriate statistical analyses were performed.

Three producer-cooperator locations were utilized 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: 12 30-inch rows/plot
Area: Variable (0.9 to 1.7 acres/plot), 3 replications of each variety
Planted: 6-May at 4.1 seed/per row-ft

Harvest aid program: 15-October, 2 pt/acre Prep + 1 pt/acre Def with Activator 90 (non-ionic surfactant - NIS) followed by 16 oz/acre Gramoxone Max + 2 oz/acre Activator 90 aerially applied on 21-October

Harvested: 1,2-December

Blanket Weed Control Program: $32.70/acre
Dominant weed species: spurred anoda, pigweed, kochia, johnsongrass, cocklebur, volunteer corn

The entire field was treated with 2 pt/acre of Treflan (trifluralin) preplant incorporated on 18-February. An additional 2 pt/acre of Direx (diuron) was banded across all varieties at planting.

Specific herbicide systems costs included:
Liberty Link variety: 32 oz/acre Ignite applied in 15 gallons/acre (GPA) total spray volume on 5-June, with a second application of 40 oz/acre Ignite at 25 GPA applied over-the-top on 21-June.
Roundup Ready varieties: 22 oz/acre Roundup WeatherMax + 17 lb of StrikeZone per 100 gallons of spray solution, applied in 15 GPA on 4-June over-the-top.

One cultivation was performed across all varieties. The entire project had significant weed pressure (spurred anoda) and the producer had hoe crews walk the field two times (28-July and 24-August). The

cost for this hand labor was $6/acre each trip. Project personnel provided labor for other weed escapes by herbicide system. The associated hoe costs were $4.20 per acre for Roundup Ready varieties, $3.60 per acre for Liberty Link.

Temik was applied in-furrow at planting at 4.0 lb/acre.

Orthene was applied at 4 oz/acre for thrips and fleahopper control on 25-May, and 4,5-June. Vydate was applied at 8 oz/acre 26-June, and on 3-July. Ammo (tankmixed with Pentia and Chaperone) at 2.13 oz/acre was applied on 3-July, for lygus species. Karate at 4 oz/acre with ULV oil was applied on 25-August, for bollworms. Intruder at 0.6 oz/acre with COC was applied on 14-September, for late season aphids. This location was in an active boll weevil eradication zone, but no applications were made by the Texas Boll Weevil Eradication Foundation.

Plant growth regulator (for growth control) applications included Pix at 6 oz/acre on 30-June, Pentia at 6 oz/acre on 13-July, (tankmixed with Chaperone and Ammo), Pix at 10 oz/acre on 23-July, and Pix at 16 oz/acre on 27-July. Chaperone was applied at 5 oz/acre on 13-July (tankmixed with Pentia and Ammo).

Varieties planted at this site included:

1. AFD 3511RR (stripper type)
2. Beltwide Cotton Genetics 28R (picker type)
3. Deltapine 432RR (picker type)
4. Deltapine 444BG/RR (picker type)
5. FiberMax 960RR (picker type)
6. FiberMax 960B2R (picker type)
7. FiberMax 989B2R (picker type)
8. Stoneville 2448R (stripper type)
9. Stoneville 4892BR (picker type)
10. FiberMax 966LL (picker type)

Location 2 – 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 1.6 acres/plot), 3 replications of each variety
Planted: 10-May at 4.0 seed/per row-ft
Harvest aid program: 17-October, 21 oz/acre Finish 6 Pro + 6 oz/acre Ginstar (no follow-up terminating paraquat application was required).

Harvested: 10,11-November

Blanket Weed Control Program: $17.37/acre
Dominant weed species: pigweed, silverleaf nightshade, morningglory, kochia

The entire field was treated with 1 qt/acre of Treflan applied preplant incorporated on 18-February. An additional 1.5 pt/acre of Direx (diuron) was banded across all varieties at planting.

One cultivation was conducted across all varieties.

Hoe costs by herbicide system were $3.06/acre for Roundup Ready varieties, $2.29/acre for Liberty Link varieties, and $3.93/acre for conventional types.

Specific herbicide systems costs included:

Liberty Link variety: 1 qt/acre Ignite applied over-the-top in 15 GPA total spray volume on 9-June.
Roundup Ready varieties: 22 oz/acre Roundup WeatherMax + 17 lb of StrikeZone per 100 gallons of spray solution, applied over-the-top in 15 GPA on 4-June.

No plant growth regulators were applied at this site.

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

Varieties planted at this site included:

1. AFD 3511RR (stripper type)
2. All-Tex 40802RR (picker type)
3. Beltwide Cotton Genetics 28R (picker type)
4. Deltapine 434RR (picker type)
5. Deltapine 432RR (picker type)
6. FiberMax 960RR (picker type)
7. FiberMax 989RR (picker type)
8. FiberMax 960B2R (picker type)
9. FiberMax 958LL (picker type)
10. Stoneville 1553R (stripper type)
11. Stoneville 2448R (stripper type)
12. AFD 2485 (stripper type)
13. AFD Raider 271 (stripper type)
14. All-Tex TopPick (picker type)

Location 3 – 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
Area: Variable (1.9 to 2.4 acres/plot), 3 replications of each variety
Planted: 11-May at 4.0 seed/per row-ft
Harvest aid program: 14-October, 32 oz/acre Finish 6 Pro (no follow-up terminating application was required)

Harvested: 4,5, 7-December

Blanket Weed Control Program: $14.18/acre

Dominant weed species: prairie sunflower, silverleaf nightshade, russian thistle, devils-claw, and buffalobur

A preplant and at-plant herbicide program was used across all varieties. This included 1 pt/acre Treflan (trifluralin) preplant incorporated on 23-April. Treflan at 4 oz/acre rate + Caparol at 6 oz/acre were applied on a 12-inch band over the row across all varieties at planting.

One blanket cultivation was conducted across all varieties.

Specific herbicide systems costs included:

Roundup Ready varieties: 22 oz/acre Roundup WeatherMax + 17 lb of StrikeZone per 100 gallons of spray solution, applied over-the-top in 15 GPA spray volume on 17-June.

Hoeing was required only for conventional varieties at a cost of $13.68/acre.

Temik was applied in-furrow at planting at 3 lb/acre.

No additional insecticides were applied at this site.

No plant growth regulators were applied at this site.

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

Varieties planted at this site included:

1. AFD 3602RR (stripper type)
2. All-Tex 40801RR (picker type)
3. All-Tex 40802RR (picker type)
4. Beltwide Cotton Genetics 28R (picker type)
5. Deltapine 488BG/RR (picker type)
6. Deltapine 444BG/RR (picker type)
7. Deltapine 494RR (picker type)
8. Deltapine 555BG/RR (picker type)
9. Paymaster 2280BG/RR (stripper type)
10. FiberMax 989B2R (picker type)
11. FiberMax 960B2R (picker type)
12. FiberMax 960RR (picker type)
13. Stoneville 5599BR (picker type)
14. Stoneville 5303R (picker type)
15. Stoneville 2448R (stripper type)
16. AFD 2485 (stripper type)
17. AFD Raider 271 (stripper type)
18. All-Tex TopPick (picker type)

Results

Agronomic and economic results as well as summaries of the expenses and associated systems costs by location and variety are provided in Tables 1-18.

Location 1 - Muleshoe

The early and late-season growth characteristics are presented in Tables 1 and 2. Plant stands averaged about 56,000 plants/acre on 3-June. No large differences were noted in stand counts. Plant mapping conducted on 1-August indicated that some varieties fruited lower on the mainstem, with the stripper variety AFD 3511R having the lowest first sympodium. Small differences for late-season plant heights and height to node ratios were noted. No large differences were noted for total nodes. Significant differences were noted for late-season first and second position fruit retention, and the stripper variety AFD 3511R had the lowest retention. Nodes above white flower (NAWF) was greater for some picker varieties than other varieties on 30-July. Days to cutout (defined as NAWF=5) ranged from 87-91 with some picker varieties taking longer.

Commercial turnouts of non-fieldcleaned bur cotton ranged from 22.6% for AFD 3511R to 26.4% for FiberMax 960RR and Deltapine 444BR (Table 3). Bur cotton yields/acre ranged from 3159 lb/acre for Beltwide Cotton Genetics (BCG) 28R to 4654 lb/acre for FiberMax 989B2R. This resulted in lint yields ranging from 748 lb/acre for BCG 28R to 1186 lb/acre for FiberMax 989B2R. Lint loan values derived from

USDA-AMS classing results of the bales obtained in the project show that values ranged from $0.3923 for FiberMax 960RR to $0.4623 for AFD 3511R. Loan value discounts were attributed to low micronaire, reduced staple length, lower color grades, lower uniformity, and high bark contamination incidence for some varieties (Table 4). After totaling lint and seed value per acre and subtracting out ginning costs and system-specific costs (Tables 5 and 6), the net value per acre ranged from a low of $269.11/acre for BCG 28R to $443.71/acre for FiberMax 960B2R (Table 3), a difference of $174.60.

Within the statistical "upper tier" of net returns, four varieties produced the same net value (FiberMax 960B2R, FiberMax 989B2R, Stoneville 2448R, and FiberMax 966LL). Two of the top four varieties were Bollgard II types (FiberMax 960B2R and FiberMax 989B2R). The new Stoneville 2448R "NexGen" Roundup Ready variety also performed well, as did a Liberty Link variety, FiberMax 966LL. Due to a relatively cool growing season, low micronaire was encountered in most bales in the project. The highest micronaire (3.2) was produced by a stripper type (AFD 3511R), and the second highest micronaire (2.9) was produced by the picker types FiberMax 960B2R, FiberMax 989B2R, and Stoneville 4892BR. Severe micronaire discount (960 points) was encountered by FiberMax 960RR with a micronaire of 2.6.

Location 2 - Blanco

The early and late-season growth characteristics are presented in Tables 7 and 8. Plant stands averaged about 32,000 plants/acre on 3-June. Stands ranged from a low of 26,000 for FiberMax 958LL to a high of 36,000 for Deltapine 432RR. Plant mapping conducted on 21-September indicated that some varieties fruited lower on the mainstem, with the stripper variety Stoneville 1553R having the lowest first sympodium, and FiberMax 960B2R having the highest, about a 3-node difference. Plant heights ranged from a low of 27.8 inches for the stripper variety Stoneville 2448R to a high of 35.8 inches for Deltapine 434RR. Height to node ratios ranged from a low of 1.86 for the stripper type Stoneville 2448R to a high of 2.47 for FiberMax 960RR. Differences in total nodes ranged from a low of 18.9 for FiberMax 960RR to a high of 22.2 for the stripper variety Raider 271. Significant differences were noted for late-season first position fruit retention, 38.3% for Raider 271 to a high of 55.5% for a stripper variety, Stoneville 1553R. Second position fruit retention ranged from a low of 17.0% for FiberMax 960RR to a high of 35.6 for Deltapine 434RR. On 21-July, NAWF ranged from a low of 5.8 for Stoneville 1553R to a high of 7.3 for Raider 271, both stripper types. On 16-August, nearly all varieties had reached cutout and NAWF ranged from a low of 3.4 for FiberMax 960B2R to a high of 5.2 for BCG 28R and All-Tex TopPick. Days to cutout (defined as NAWF=5) ranged from 80 to 99 with Stoneville 1553R reaching cutout fastest, and BCG 28R and All-Tex TopPick taking longer.

Commercial turnouts of non-fieldcleaned bur cotton ranged from 20.9% for Stoneville 2448R to 26.8% for FiberMax 989RR and Deltapine 434RR (Table 9). Bur cotton yields/acre ranged from 3597 lb/acre for BCG 28R to 4460 lb/acre for Stoneville 2448R. This resulted in lint yields ranging from 905 lb/acre for Raider 271 to 1122 lb/acre for AFD 2485, both conventional varieties. Lint loan values derived from USDA-AMS classing results of the bales obtained in the project show that values ranged from $0.4986 for FiberMax 960RR to $0.5406 for Deltapine 432RR. Loan value discounts were attributed to low micronaire, lower uniformity for some varieties, and high bark contamination incidence for some varieties (Table 10). After totaling lint and seed value per acre and subtracting out ginning costs and system-specific costs (Tables 11 and 12), the net value per acre ranged from a low of $439.09/acre for Stoneville 2448R to $594.65/acre for AFD 2485, a conventional variety (Table 9), a difference of $155.56.

Within the statistical "upper tier" of net returns, two varieties produced the same net value (AFD 2485 and Deltapine 432RR). The AFD 2485 variety is a conventional type, and due to relatively low weed pressure at this site, additional weed control inputs were not required. Four of the top five performing varieties in terms of net value were transgenic Roundup Ready types. Eleven of the 14 varieties produced low micronaire lint (less than 3.5). It is interesting to note that some picker varieties (Deltapine 432RR and BCG 28R) did not produce low micronaire discount lint, whereas only one stripper type AFD 3511R did not. FiberMax 960RR produced the lowest micronaire (3.1), which resulted in a 370 point discount.

Location 3 – Plains

The early and late-season growth characteristics are presented in Tables 13 and 14. Plant stands averaged about 35,000 plants/acre on 12-June. Stands ranged from a low of 26,000 for Stoneville 5303R to a high of 44,000 for AFD 2485. Plant mapping conducted on 8-September indicated that some varieties fruited lower on the mainstem, with the stripper varieties AFD 3602R, Paymaster 2280BG/RR, Stoneville 2448R having the lowest first sympodium, and Deltapine 555BG/RR having the highest, about a 2-node difference. Plant heights ranged from a low of 26.5 inches for the stripper variety Stoneville 2448R to a high of 38.0 inches for Deltapine 555BG/RR. Height to node ratios ranged from a low of 1.3 for the stripper type Stoneville 2448R to a high of 1.9 for Stoneville 5303R. Differences in total nodes ranged from a low of 19.5 for Deltapine 444BG/RR to a high of 23.6 for Deltapine 555BG/RR. Significant differences were noted for late-season first position fruit retention, 71.3% for Stoneville 2448R to a high of 91.1% for FiberMax 960B2R. Second position fruit retention ranged from a low of 56% for AFD 2485 to a high of 79.8 for All-Tex 40802RR. On 28-July, NAWF ranged from a low of 6.8 for Stoneville 5303R to a high of 9.2 for Deltapine 555BG/RR, both picker types. On 9-September, all varieties had reached cutout and NAWF ranged from a low of 2.3 for FiberMax 960RR to a high of 4.6 for Deltapine 555BG/RR. Days to cutout (defined as NAWF=5) ranged from 97 to 116 with Paymaster 2280BG/RR and FiberMax 960B2R reaching cutout fastest, and Deltapine 555BG/RR taking 19 more days.

This site encountered *a defoliating hail event on 5-October*. On 14-October, a 32 oz/acre rate of Finish 6 Pro was applied to open bolls and to remove residual leaves. In spite of the hail event, the trial remained intact, with minimal boll damage, as can be seen in the yield data. Micronaire values were somewhat reduced by premature defoliation. Commercial turnouts of non-fieldcleaned bur cotton ranged from 17.3% for Raider 271 to 22.8% for AFD 2485 (Table 15). Bur cotton yields/acre ranged from 3042 lb/acre for Deltapine 555BG/RR to 4643 lb/acre for Paymaster 2280BG/RR. This resulted in lint yields ranging from 611 lb/acre for Deltapine 555BG/RR to 977 lb/acre for AFD 2485. Lint loan values derived from USDA-AMS classing results of the bales obtained in the project show that values ranged from $0.4015 for Stoneville 5599BR to $0.4821 for Raider 271. Loan value discounts were attributed to low micronaire, marginally short staple, reduced color quality, lower uniformity, and high bark contamination incidence for all varieties (Table 16). After totaling lint and seed value per acre and subtracting out ginning costs and system-specific costs (Tables 17 and 18), the net value per acre ranged from a low of $218.20/acre for Deltapine 555BG/RR to $435.22/acre for AFD 2485, a conventional variety (Table 15), a difference of $217.02.

Within the statistical “upper tier” of net returns, one variety produced the highest net value (AFD 2485). The AFD 2485 variety is a conventional type, and even with substantial hoe costs ($13.68) due to weed pressure at this site, it produced the highest net return. Six of the seven “second tier” varieties were transgenics (Roundup Ready, Bollgard plus Roundup Ready, and Bollgard II plus Roundup Ready). Within this tier, three varieties were stripper types (Paymaster 2280BG/RR, Raider 271, and Stoneville 2448R). All 18 varieties produced low micronaire lint (less than 3.5). The highest micronaire (3.4) variety was a stripper type (Raider 271) with a corresponding 195 point discount. The lowest micronaire values of 2.7 were all produced by picker types (All-Tex 40802RR, Deltapine 488BG/RR, and FiberMax 989B2R) and resulted in 670 point discounts.

Summary and Conclusions

In 2004, a year characterized by reduced heat units, especially further north in the High Plains, and

generally substantially above average rainfall, some important variety differences were noted. Fall weather was cooler than the region experienced over the last several years, and high rainfall and some snow fall resulted in significant preharvest losses for looser varieties. After going through these weather conditions, picker type varieties still performed very well at some locations. Although these sites did encounter wet snowfall, and fairly high wind and rainfall intensities at times, the most important concern was the fact that these trials did not receive sleet or extremely high wind storms.

At the Muleshoe site, yields were significantly down compared to previous years. This was more of a factor of reduced heat units than preharvest loss. Within the statistical "upper tier" of net returns, four varieties produced the same net value (FiberMax 960B2R, FiberMax 989B2R, Stoneville 2448R, and FiberMax 966LL). Two of the top four varieties were Bollgard II types (FiberMax 960B2R and FiberMax 989B2R). The new Stoneville 2448R "NexGen" Roundup Ready variety also performed well, as did a Liberty Link variety, FiberMax 966LL. Due to a relatively cool growing season, low micronaire was encountered in most bales in the project. The highest micronaire (3.2) was produced by a stripper type (AFD 3511R), and the second highest micronaire (2.9) was produced by the picker types FiberMax 960B2R, FiberMax 989B2R, and Stoneville 4892BR. Severe micronaire discount (960 points) was encountered by FiberMax 960RR with a micronaire of 2.6.

In the typically lower-yielding environment at Blanco, yields were well above the previous several years due to timely above average rainfall. Although reduced heat units were also encountered there, varieties still performed very well. In spite of the weather conditions after the cotton was harvest ready, picker varieties did not have excessive preharvest losses. Within the statistical "upper tier" of net returns, two varieties produced the same net value (AFD 2485 and Deltapine 432RR). The AFD 2485 variety is a conventional type, and due to relatively low weed pressure at this site, additional weed control inputs were not required. Four of the top five performing varieties in terms of net value were transgenic Roundup Ready types. Eleven of the 14 varieties produced low micronaire lint (less than 3.5). It is interesting to note that some picker varieties (Deltapine 432RR and BCG 28R) did not produce low micronaire discount lint, whereas only one stripper type AFD 3511R did not. FiberMax 960RR produced the lowest micronaire (3.1), which resulted in a 370 point discount.

At the Plains site, a defoliating hail event resulted in premature defoliation of leaves. After an application of an ethephon-based harvest aid, most bolls opened, but produced lower micronaire than what would have likely occurred. Picker varieties did experience some minimal preharvest loss, but not excessive. Within the statistical "upper tier" of net returns, one variety produced the highest net value (AFD 2485). The AFD 2485 variety is a conventional type, and even with substantial hoe costs ($13.68) due to weed pressure at this site, it produced the highest net return. Six of the seven "second tier" varieties were transgenics (Roundup Ready, Bollgard plus Roundup Ready, and Bollgard II plus Roundup Ready). Within this tier, three varieties were stripper types (Paymaster 2280BG/RR, Raider 271, and Stoneville 2448R). All 18 varieties produced low micronaire lint (less than 3.5). The highest micronaire (3.4) variety was a stripper type (Raider 271) with a corresponding 195 point discount. The lowest micronaire values of 2.7 were all produced by picker types (All-Tex 40802RR, Deltapine 488BG/RR, and FiberMax 989B2R) and resulted in 670 point discounts.

Results from the 2004 production season at varying locations in the Texas High Plains indicate that some transgenic varieties were competitive with a conventional type in terms of production economics. Picker varieties tended to produce lower micronaire lint than some stripper types, attributed to later maturity and a cooler growing season. These data indicate that substantial differences can be obtained in terms of net value/acre due to variety selection. The differences in net value/acre when comparing the top and bottom varieties were $174, $155, and $217/acre for Muleshoe, Blanco, and Plains, respectively. Additional multi-site and multi-year applied research is needed to evaluate varieties across a series of environments.

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Table 1. Stand counts and nodes above white flower (NAWF) results from the irrigated large plot replicated systems trial, James Brown Farm, Muleshoe, TX 2004

Variety	19-May		3-Jun		NAWF				Days	
	Plants/row-ft	Plants/acre	Plants/row-ft	Plants/acre	30-Jul	6-Aug	17-Aug	24-Aug	to cutout	Cutout date
AFD 3511R	2.8	49,368	2.9	50,878	5.7	4.1	2.7	2.2	88	2-Aug
BCG 28R	2.9	50,762	2.9	50,994	7.0	5.0	3.9	2.9	92	6-Aug
DP 432RR	3.0	51,691	3.2	56,454	5.9	4.4	2.8	2.7	89	3-Aug
DP 444BR	3.3	58,545	3.3	57,499	6.3	4.7	3.6	2.9	91	5-Aug
FM 960B2R	3.2	55,176	3.4	58,893	5.8	3.7	2.8	1.8	88	2-Aug
FM 960RR	3.2	54,943	3.3	57,499	6.2	4.4	2.9	2.0	90	4-Aug
FM 966LL	3.3	57,847	3.5	60,171	6.1	4.5	2.9	2.6	90	4-Aug
FM 989B2R	3.1	53,201	3.2	55,640	5.7	3.6	2.3	1.6	87	1-Aug
ST 2448R	3.2	55,292	3.4	58,428	6.1	3.9	2.9	2.1	88	2-Aug
ST 4892BR	3.1	53,898	3.1	54,363	6.6	4.8	4.1	3.1	91	5-Aug
Test average	3.1	54,072	3.2	56,082	6.1	4.3	3.1		--	--
CV, %	5.2	5.2	5.1	5.2	4.8	7.0	11.1	13.0	--	--
OSL	0.0295	0.0153	0.0050	0.0104	0.0006	0.0002	<0.0001	<0.0001	--	--
LSD 0.05	0.3	4,805	0.3	4,986					--	--

NAWF numbers represent an average of 30 plants per variety (10 plants/variety/rep with 3 reps)
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. Plant map results from the irrigated large plot replicated systems trial, James Brown Farm, Muleshoe, TX 2004.

Variety	18-Aug						
	Plant height	Node of first fruiting branch	Fruiting nodes	Mainstem nodes	Height to node	Fruit retention	
						First position	Second position
	inches	node number	total/plant	total/plant	ratio	percent	percent
AFD 3511R	21.3	5.0	13.5	17.5	1.22	73.2	63.7
BCG 28R	19.6	6.0	13.0	18.0	1.09	88.3	82.5
DP 432RR	22.0	6.8	11.5	17.4	1.27	88.2	85.0
DP 444BR	23.3	6.3	12.5	17.8	1.31	89.0	84.9
FM 960B2R	20.5	7.4	11.4	18.0	1.13	81.9	78.5
FM 960RR	20.8	7.1	12.1	18.1	1.15	87.1	82.3
FM 966LL	21.7	6.7	12.8	18.6	1.17	81.5	78.0
FM 989B2R	20.8	7.5	12.2	18.7	1.11	85.6	69.8
ST 2448R	19.8	6.1	12.4	17.6	1.13	81.4	52.2
ST 4892BR	24.1	6.8	12.6	18.3	1.32	83.0	80.3
Test average	21.4	6.6	12.4	18.0	1.19	83.9	75.7
CV, %	4.6	4.2	5.2	3.7	4.1	5.0	10.7
OSL	0.0004	<0.0001	0.0261	0.2471	<0.0001	0.0058	0.0015
LSD 0.05	1.7	0.5	1.1	NS	0.08	7.1	13.9

Numbers in table represent an average of 18 plants per variety (6 plants/variety/rep with 3 reps).
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.
Plant map occured on August 18.

Table 3. Harvest results from the irrigated large plot replicated systems trial, James Brown Farm, Muleshoe, TX 2004.

Variety	Commercial turnout	Bur cotton yield	Lint yield	Seed yield	Seed	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Systems cost	Net value	
	%	lb/acre	lb/acre	lb/acre	lb/bale	$/lb	$/acre	$/acre	$/acre	$/acre	$/acre	$/acre	
FM 960B2R	25.2	4616	1164	1751	722	0.4432	516.10	109.42	625.52	103.85	77.95	443.71	a
FM 989B2R	25.5	4654	1186	1841	745	0.4289	508.87	115.05	623.92	104.72	76.89	442.31	a
ST 2448R	24.8	4554	1129	1755	746	0.4166	470.35	109.67	580.02	102.47	53.39	424.16	ab
FM 966LL	25.8	4169	1073	1586	709	0.4499	483.04	99.16	582.19	93.81	72.48	415.90	ab
FM 960RR	26.4	4314	1137	1647	696	0.3923	445.97	102.95	548.92	97.06	58.14	393.72	bc
AFD 3511R	22.6	4033	912	1560	822	0.4623	421.33	97.50	518.84	90.74	45.70	382.40	bcd
DP 444BR	26.4	4214	1111	1434	620	0.4206	467.00	89.63	556.63	94.82	80.84	380.97	bcd
DP 432RR	23.1	4595	1060	1622	735	0.4112	435.85	101.39	537.24	103.38	62.35	371.51	cd
ST 4892BR	24.2	4108	993	1442	697	0.4227	419.71	90.10	509.82	92.44	76.53	340.85	d
BCG 28R	23.7	3159	748	1144	734	0.4271	319.36	71.51	390.87	71.08	50.68	269.11	e
Test average	24.8	4242	1051	1578	723	0.4275	448.76	98.64	547.40	95.44	65.50	386.46	
LSD 0.05	--	398	100	145	--	--	43.34	9.08	52.36	8.97	--	43.45	
CV, %	--	5.5	5.6	5.4	--	--	5.6	5.4	5.6	5.5	--	6.6	

Means within a column with the same letter are not significantly different at the 0.05 probability level.
LSD - least significant difference, NS - not significant.

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

Assumes:
$2.25/cwt ginning cost.
$125/ton for seed.
Value for lint based on CCC loan value from commercially ginned bales and USDA-AMS classing results.

Table 4. USDA-AMS classing results of commercially ginned bales from the irrigated large plot replicated systems trial, James Brown Farm, Muleshoe, TX 2004.

Variety		Color 1	Color 2	Staple	Leaf	Mic	Remarks	rd	+b	Length	Strength	Unif	Loan
		units	units	32nds	units	units	bark	%	units	100ths	g/tex	%	$/lb
FM 966LL	Mean	3.9	1.0	34.9	3.8	2.8	7/8 bales	76.0	7.6	108.4	30.1	79.5	0.4499
	Std Dev	0.4	0.0	0.4	0.5	0.1		0.9	0.2	1.1	0.8	0.8	0.0108
AFD 3511R	Mean	4.0	1.2	33.3	3.2	3.2	2/6 bales	74.0	8.6	103.8	28.7	79.8	0.4623
	Std Dev	0.0	0.4	0.5	0.4	0.1		1.3	0.4	1.2	1.0	1.0	0.0231
DP 444BR	Mean	3.8	1.0	33.1	3.1	2.7	6/8 bales	75.9	8.0	103.6	27.0	79.0	0.4206
	Std Dev	0.5	0.0	0.4	0.4	0.1		1.0	0.2	1.5	0.8	0.5	0.0183
DP 432RR	Mean	4.0	1.0	32.6	3.8	2.7	6/8 bales	73.4	8.4	101.5	25.6	79.1	0.4112
	Std Dev	0.0	0.0	0.5	0.5	0.1		0.7	0.2	0.8	0.7	0.8	0.0119
FM 960B2R	Mean	3.8	1.0	34.3	3.2	2.9	9/9 bales	76.2	7.8	107.2	28.3	78.4	0.4432
	Std Dev	0.4	0.0	1.0	0.4	0.1		0.7	0.2	2.8	1.1	0.5	0.0104
FM 960RR	Mean	3.9	1.0	33.3	4.0	2.6	6/9 bales	75.9	7.7	104.1	27.9	77.6	0.3923
	Std Dev	0.3	0.0	1.0	0.0	0.0		0.9	0.1	2.7	1.5	1.1	0.0330
FM 989B2R	Mean	3.7	1.0	33.4	3.9	2.9	5/9 bales	76.9	7.6	104.8	28.6	77.8	0.4289
	Std Dev	0.5	0.0	0.7	0.3	0.1		0.8	0.1	2.2	0.8	0.7	0.0174
ST 2448R	Mean	3.8	1.0	33.0	3.8	2.8	9/9 bales	74.9	8.1	103.2	29.4	79.8	0.4166
	Std Dev	0.4	0.0	0.5	0.4	0.1		0.8	0.1	1.4	0.9	0.7	0.0099
ST 4892BR	Mean	3.0	1.0	32.3	2.8	2.9	5/8 bales	75.1	9.1	101.3	26.9	78.9	0.4227
	Std Dev	0.0	0.0	0.5	0.5	0.0		0.4	0.2	1.3	0.7	0.6	0.0087
BCG 28R	Mean	3.6	1.1	33.0	3.3	2.8	1/7 bales	74.6	8.6	103.1	25.9	78.1	0.4271
	Std Dev	0.5	0.4	0.6	0.5	0.1		1.7	0.3	1.7	1.1	1.1	0.0108

Table 5. Seed and technology expenses* for the irrigated large plot replicated systems trial, James Brown Farm, Muleshoe, TX 2004.

Variety	Seed/lb	Seed/bag	Acres planted /bag	Seed fee $/bag	Tech fee $/bag	Total seed and tech fee $/bag	Seed and tech fee $/acre
AFD 3511RR	4,500	225,000	3.13	49.40	37.80	87.20	27.90
BCG 28R	5,605	280,250	3.89	68.50	59.50	128.00	32.88
DP 432RR	5,200	250,000	3.47	97.50	57.20	154.70	44.55
DP 444BG/RR	4,500	250,000	3.47	97.50	121.40	218.90	63.04
FM 960RR	4,400	220,000	3.06	72.95	50.30	123.25	40.34
FM 960B2R	4,188	209,400	2.91	72.95	102.00	174.95	60.15
FM 989B2R	4,500	225,000	3.13	72.95	111.70	184.65	59.09
FM 966LL	4,300	215,000	2.99	125.00	.	125.00	41.86
ST 2448R	4,545	230,000	3.19	75.90	37.80	113.70	35.59
ST 4892BR	4,600	230,000	3.19	75.90	111.70	187.60	58.73

***Trial was planted at 72,000 seed/acre in 30-inch rows.**

Table 6. Expenses incurred for the irrigated large plot replicated systems trial, James Brown Farm, Muleshoe, TX 2004.

	Variety	Seed cost/bag	Tech fees/bag	Total cost/bag	Seed & tech fee/ac	Herb apps	Herb app cost/ac	Roundup WeatherMax cost/ac	Ignite cost/ac	Hoe cost cost/ac	Systems cost/ac
1	AFD 3511RR	49.40	37.80	87.20	27.90	1	3.50	10.10	0.00	4.20	45.70
2	BCG 28R	68.50	59.50	128.00	32.88	1	3.50	10.10	0.00	4.20	50.68
3	DP 432RR	97.50	57.20	154.70	44.55	1	3.50	10.10	0.00	4.20	62.35
4	DP 444BG/RR	97.50	121.40	218.90	63.04	1	3.50	10.10	0.00	4.20	80.84
5	FM 960RR	72.95	50.30	123.25	40.34	1	3.50	10.10	0.00	4.20	58.14
6	FM 960B2R	72.95	102.00	174.95	60.15	1	3.50	10.10	0.00	4.20	77.95
7	FM 989B2R	72.95	111.70	184.65	59.09	1	3.50	10.10	0.00	4.20	76.89
8	ST 2448R	75.90	37.80	113.70	35.59	1	3.50	10.10	0.00	4.20	53.39
9	ST 4892BR	75.90	111.70	187.60	58.73	1	3.50	10.10	0.00	4.20	76.53
10	FM 966LL	125.00		125.00	41.86	2	7.00	0.00	20.02	3.60	72.48
					30" inch rows	3.50/ac		June 4 over-the-top of all	June 5 & 21	6.00/hr	
					4.1 seed/row-ft			Roundup Ready varieties	over the top	Time spent Hoeing	
					72000 seed/ac			57.00/gal	of Liberty Link varieties	0.7 hr/ac on RR	
								Roundup WeatherMax	35.60/gal	1.38 hrs/ac on LL.	
Base weed control program				chem cost	app cost	total cost		rate at 22 oz/ac	Ignite rate	Total hours	
								includes AMS at 0.31/ac	at 32 oz/ac	hoeing = 33.48	
	Pre- and At-planting								and 40 oz/ac		
18-Feb	2 pt/acre Treflan PPI			6.87	3.50	10.37					
6-May	2 pt/acre Direx at plant			5.33		5.33					
28-Jul	Blanket hoe cost					6.00					
24-Aug	Blanket hoe cost					6.00					
25-Jun	Blanket Cultivation				5.00	5.00					
Total blanket weed control program						32.70					
PGR program											
30-Jun	6 oz/acre Pix by airplane			4.00	3.75	7.75					
13-Jul	6 oz/acre Pentia			4.00		4.00					
13-Jul	5 oz/acre Chaperone			4.30		4.30					
23-Jul	10 oz/acre Pix by airplane			6.67	3.75	10.42					
27-Jul	16 oz/acre Pix by airplane			10.67	3.75	14.42					
Insecticide program											
6-May	4.0 lb/acre Temik at plant			14.00		14.00					
25-May	4 oz/acre Orthene for thrips			2.53	3.75	6.28					
	by airplane										
4-5 Jun	4 oz/acre Orthene for thrips			2.53		2.53					
26-Jun	8 oz/acre Vydate by airplane			4.62	3.75	8.37					
3-Jul	8 oz/acre Vydate by airplane			4.62	3.75	8.37					
13-Jul	2.13 oz/acre Ammo for lygus			2.09	3.75	5.84					
	with Pentia and Chaperone (see above)										
	by airplane										
25-Aug	4 oz/acre Karate for bollworms by airplane			12.03	3.75	15.78					
	with ULV oil										
14-Sep	0.6 oz/acre Intruder for aphids by airplane			5.25	3.75	9.00					
	with COC										
Harvest aid program											
15-Oct	32 oz/acre Prep + 16 oz/acre Def 6			18.90	3.75	22.65					
	with Activator 90 by airplane										
21-Oct	16 oz/acre Gramoxone Max			4.88	3.75	8.63					
	with Activator 90 by airplane										
Total blanket input cost ($/acre)						175.04					

Table 7. Stand counts and nodes above white flower (NAWF) results from the irrigated large plot replicated systems trial, Appling Farms, Blanco, TX 2004.

Variety	19-May		3-Jun		NAWF				Days	
	Plants/row-ft	Plants/acre	Plants/row-ft	Plants/acre	21-Jul	2-Aug	10-Aug	16-Aug	to cutout	Cutout date
All Tex 40802R	2.6	34,238	2.6	34,238	6.6	5.6	4.7	4.2	90	8-Aug
AFD 2485	2.7	35,632	2.8	36,329	6.4	5.4	4.9	4.7	91	9-Aug
AFD 3511R	2.4	31,015	2.2	29,534	6.2	4.8	4.6	4.0	83	1-Aug
BCG 28R	2.6	33,977	2.6	33,454	7.1	6.1	5.7	5.2	99	17-Aug
DP 432RR	2.8	36,155	2.6	34,500	6.2	5.0	5.1	4.4	84	2-Aug
DP 434RR	2.4	31,799	2.5	33,019	6.9	6.2	5.5	4.8	96	14-Aug
FM 958LL	2.0	26,484	2.3	29,621	6.5	5.7	4.9	4.8	91	9-Aug
FM 960B2R	2.5	32,670	2.4	31,712	6.3	4.6	4.0	3.4	81	30-Jul
FM 960RR	2.5	32,583	2.6	34,238	6.4	4.7	4.4	3.8	82	31-Jul
FM 989RR	2.3	30,057	2.2	28,576	7.1	5.2	4.9	4.2	89	7-Aug
AFD Raider 271	2.4	31,712	2.4	31,537	7.3	5.3	5.0	5.0	92	10-Aug
ST 1553R	2.4	30,927	2.3	29,708	5.8	4.6	3.9	3.6	80	29-Jul
ST 2448R	2.3	30,143	2.3	30,231	6.6	5.1	4.3	4.2	85	3-Aug
All Tex Toppick	2.3	29,882	2.4	30,927	6.8	5.5	5.5	5.2	99	17-Aug
Test average	2.4	31948.0	2.4	31973.1	6.6	5.3	4.8	4.4	--	--
CV, %	7.8	7.7	7.7	7.5	6.6	8.5	8.4	9.9	--	--
OSL	0.0066	0.0054	0.0141	0.1130	0.0185	0.0011	0.0002	0.0002	--	--
LSD 0.05	0.3	4,128	0.3	4,042	0.7	0.8	0.7	0.7	--	--

NAWF numbers represent an average of 30 plants per variety (10 plants/variety/rep with 3 reps)
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 8. Plant map results from the irrigated large plot replicated systems trial, Appling Farms, Blanco, TX 2004.

Variety	21-Sep						
	Plant height	Node of first fruiting branch	Fruiting nodes	Mainstem nodes	Height to node	Fruit retention	
						First position	Second position
	inches	node number	total/plant	total/plant	ratio	percent	percent
All Tex 40802R	32.8	6.8	15.1	20.9	2.19	53.0	33.2
AFD 2485	29.1	7.5	13.6	20.6	2.14	49.0	21.1
AFD 3511R	28.2	6.0	15.2	20.2	1.87	50.1	33.2
BCG 28R	29.4	6.2	15.1	20.4	1.96	53.0	27.2
DP 432RR	31.8	6.6	14.1	19.7	2.26	46.5	28.2
DP 434RR	35.8	6.1	15.2	20.2	2.38	53.0	35.6
FM 958LL	27.9	7.9	14.4	21.3	1.94	51.9	25.2
FM 960B2R	30.6	8.3	13.2	20.5	2.34	53.5	24.5
FM 960RR	29.7	7.3	12.0	18.9	2.47	54.2	17.0
FM 989RR	32.8	7.5	13.9	20.9	2.36	49.4	18.3
AFD Raider 271	34.1	6.7	16.5	22.2	2.07	38.3	29.3
ST 1553R	28.4	5.1	14.8	19.2	1.93	55.5	34.9
ST 2448R	27.8	6.4	15.1	20.5	1.86	51.3	32.5
All Tex Toppick	32.2	6.5	14.2	19.7	2.28	48.0	28.3
Test average	30.8	6.8	14.5	20.4	2.1	50.5	27.7
CV, %	3.6	8.5	4.2	2.7	5.2	7.7	21.7
OSL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0022	0.0091
LSD 0.05	1.9	1.0	1.0	0.9	0.19	6.5	10.1

Numbers in table represent an average of 18 plants per variety (6 plants/variety/rep with 3 reps).
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 9. Harvest results from the irrigated large plot replicated systems trial, Appling Farms, Blanco, TX 2004.

Variety	Commercial turnout	Bur cotton yield	Lint yield	Seed yield	Seed	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Systems cost	Net value	
	%	lb/acre	lb/acre	lb/acre	lb/bale	$/lb	$/acre	$/acre	$/acre	$/acre	$/acre	$/acre	
AFD 2485	26.6	4223	1122	1688	722	0.5317	596.54	105.49	702.04	95.02	12.37	594.65	a
DP 432RR	24.6	4333	1067	1737	781	0.5406	576.85	108.53	685.38	97.49	49.01	538.89	ab
DP 434RR	26.8	4054	1086	1569	693	0.5233	568.21	98.05	666.26	91.21	49.01	526.04	bc
FM 960RR	26.5	4185	1108	1694	734	0.4986	552.52	105.90	658.42	94.16	45.94	518.32	bc
FM 989RR	26.8	3895	1042	1550	714	0.5175	539.34	96.84	636.18	87.63	44.67	503.88	bcd
AFD 3511R	24.1	4139	998	1663	800	0.5231	522.35	103.97	626.32	93.13	36.92	496.27	bcde
All Tex 40802R	24.2	4231	1026	1774	830	0.5084	521.41	110.85	632.26	95.21	42.21	494.84	bcde
All Tex Toppick	23.9	3827	916	1565	820	0.5394	494.08	97.84	591.92	86.11	11.61	494.21	bcde
ST 1553R	24.6	4068	999	1821	875	0.5128	512.11	113.84	625.95	91.53	42.50	491.91	bcde
FM 960B2R	25.0	4073	1017	1514	715	0.5196	528.34	94.65	622.99	91.64	60.33	471.02	cde
BCG 28R	25.6	3597	922	1409	733	0.5388	496.73	88.03	584.76	80.92	40.53	463.31	de
AFD Raider 271	22.7	3994	905	1658	880	0.5032	455.26	103.65	558.90	89.85	12.12	456.93	de
FM 958LL	24.1	3853	928	1331	689	0.5205	482.97	83.19	566.17	86.70	35.09	444.38	e
ST 2448R	20.9	4460	931	1753	904	0.5075	472.36	109.56	581.92	100.34	42.50	439.09	e
Test average	24.7	4067	1005	1623	778	0.5204	522.79	101.46	624.25	91.50	37.49	495.27	
LSD 0.05	--	442	108	181	--	--	56.07	11.28	67.28	9.96	--	57.35	
CV, %	--	6.5	6.4	6.6	--	--	6.4	6.6	6.4	6.5	--	6.9	

Means within a column with the same letter are not significantly different at the 0.05 probability level.
LSD - least significant difference, NS - not significant.

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

Assumes:
$2.25/cwt ginning cost.
$125/ton for seed.
Value for lint based on CCC loan value from commercially ginned bales and USDA-AMS classing results.

Table 10. USDA-AMS classing results of commercially ginned bales from the irrigated large plot replicated systems trial, Appling Farms, Blanco, TX 2004

Variety		Color 1	Color 2	Staple	Leaf	Mic	Remarks	rd	+b	Length	Strength	Unif	Loan
		units	units	32nds	units	units	bark	%	units	100ths	g/tex	%	$/lb
DP 432RR	Mean	3.6	1.0	35.1	3.3	3.7	0/7 bales	77	7.5	109.4	28.7	81.3	0.5406
	Std Dev	0.5	0.0	0.7	0.5	0.0		0.7	0.2	2.2	0.8	1.0	0.0078
All Tex Toppick	Mean	3.2	1.0	36.3	3.0	3.4	1/6 bales	80	7.0	112.8	29.2	80.3	0.5394
	Std Dev	0.4	0.0	0.8	0.0	0.1		0.5	0.2	1.8	1.5	0.8	0.0141
BCG 28R	Mean	3.2	1.0	34.7	3.0	3.6	0/6 bales	79	7.4	107.7	27.9	79.7	0.5388
	Std Dev	0.4	0.0	1.0	0.0	0.1		0.5	0.2	3.3	1.0	0.8	0.0216
FM 989RR	Mean	2.9	1.0	35.1	3.1	3.2	1/7 bales	80	7.2	109.3	30.4	80.3	0.5175
	Std Dev	0.4	0.0	0.7	0.4	0.1		0.7	0.3	1.5	0.7	0.8	0.0083
DP 434RR	Mean	3.0	1.0	35.7	3.3	3.4	2/7 bales	80	7.2	111.1	26.5	79.9	0.5233
	Std Dev	0.0	0.0	0.5	0.5	0.0		0.7	0.2	1.7	0.8	1.1	0.0111
FM 960RR	Mean	3.1	1.0	35.4	3.7	3.1	1/7 bales	80	7.0	110.4	30.0	80.3	0.4986
	Std Dev	0.4	0.0	1.1	0.5	0.0		0.7	0.2	3.1	0.8	1.5	0.0161
FM 960B2R	Mean	3.0	1.0	36.1	3.6	3.2	0/7 bales	80	6.9	111.7	30.3	79.7	0.5196
	Std Dev	0.0	0.0	0.4	0.5	0.1		0.5	0.2	1.5	1.2	0.8	0.0116
AFD 2485	Mean	3.4	1.0	36.6	3.9	3.4	0/7 bales	79	6.8	113.4	30.2	80.7	0.5317
	Std Dev	0.5	0.0	0.5	0.4	0.1		0.5	0.1	1.1	0.9	0.8	0.0098
ST 2448R	Mean	3.7	1.0	35.2	3.7	3.4	6/6 bales	77	7.7	108.8	30.1	81.8	0.5075
	Std Dev	0.5	0.0	0.8	0.5	0.1		0.8	0.2	1.7	0.6	0.8	0.0179
ST 1553R	Mean	3.3	1.0	36.3	3.5	3.3	4/6 bales	78	7.4	113.0	30.7	81.5	0.5128
	Std Dev	0.5	0.0	0.5	0.5	0.1		0.4	0.4	2.3	0.4	0.8	0.0194
AFD 3511R	Mean	3.2	1.0	34.3	3.7	3.7	2/6 bales	77	7.8	107.0	29.1	80.5	0.5231
	Std Dev	0.4	0.0	0.8	0.5	0.1		0.5	0.1	1.8	1.2	0.5	0.0182
All Tex 40802RR	Mean	3.0	1.0	35.9	3.4	3.2	1/7 bales	79.0	7.3	112.0	28.1	79.9	0.5084
	Std Dev	0.0	0.0	0.4	0.5	0.0		0.0	0.2	1.5	0.6	0.7	0.0151
AFD Raider 271	Mean	3.3	1.0	37.3	3.7	3.2	3/6 bales	78.3	7.3	116.3	30.8	81.5	0.5032
	Std Dev	0.5	0.0	0.5	0.5	0.1		0.5	0.2	2.1	1.0	0.5	0.0161
FM 958LL	Mean	3.5	1.0	36.7	3.7	3.3	0/6 bales	80.0	6.6	114.3	29.9	80.2	0.5205
	Std Dev	0.5	0.0	0.5	0.5	0.1		1.5	0.2	1.2	0.5	0.8	0.0115

Table 11. Seed and technology expenses* for the irrigated large plot replicated systems trial, Appling Farms, Blanco, TX 2004.

Variety	Seed/lb	Seed/bag	Acres planted /bag	Seed fee $/bag	Tech fee $/bag	Total seed and tech fee $/bag	Seed and tech fee $/acre
AFD 3511R	4,500	225,000	4.30	49.40	37.80	87.20	20.26
All Tex 40802RR	5,000	250,000	4.78	65.00	57.20	122.20	25.55
BCG 28R	5,605	280,250	5.36	68.50	59.50	128.00	23.87
DP 434RR	4,720	250,000	4.78	97.50	57.20	154.70	32.35
DP 432RR	5,200	250,000	4.78	97.50	57.20	154.70	32.35
FM 960RR	4,400	220,000	4.21	72.95	50.30	123.25	29.28
FM 989RR	4,730	236,500	4.52	72.95	53.80	126.75	28.01
FM 960B2R	4,188	209,400	4.01	72.95	102.00	174.95	43.67
ST 1553R	4,370	230,000	4.40	75.90	37.80	113.70	25.84
ST 2448R	4,545	230,000	4.40	75.90	37.80	113.70	25.84
FM 958LL	4,460	223,000	4.27	125.00	.	125.00	29.30
AFD 2485	4,560	228,000	4.36	36.80	.	36.80	8.44
AFD Raider 271	4,700	235,000	4.50	36.80	.	36.80	8.19
All Tex Toppick	4,900	245,000	4.69	36.00	.	36.00	7.68

***Trial was planted at 52,272 seed/acre in 40-inch rows.**

Table 12. Expenses incurred for the irrigated large plot replicated systems trial, Appling Farms, Blanco, TX 2004.											
		Seed	Tech	Total	Seed &	Herb	Herb app	Ingnite	Roundup WeatherMax	Hoe cost	Systems
	Variety	cost/bag	fees/bag	cost/bag	tech fee/ac	apps	cost/ac	cost/ac	cost/ac	cost/ac	cost/ac
1	AFD 3511R	49.40	37.80	87.20	20.26	1	3.50	0.00	10.10	3.06	36.92
2	All Tex 40802RR	65.00	57.20	122.20	25.55	1	3.50	0.00	10.10	3.06	42.21
3	BCG 28R	68.50	59.50	128.00	23.87	1	3.50	0.00	10.10	3.06	40.53
4	DP 434RR	97.50	57.20	154.70	32.35	1	3.50	0.00	10.10	3.06	49.01
5	DP 432RR	97.50	57.20	154.70	32.35	1	3.50	0.00	10.10	3.06	49.01
6	FM 960RR	72.95	50.30	123.25	29.28	1	3.50	0.00	10.10	3.06	45.94
7	FM 989RR	72.95	53.80	126.75	28.01	1	3.50	0.00	10.10	3.06	44.67
8	FM 960B2R	72.95	102.00	174.95	43.67	1	3.50	0.00	10.10	3.06	60.33
9	ST 1553R	75.90	37.80	113.70	25.84	1	3.50	0.00	10.10	3.06	42.50
10	ST 2448R	75.90	37.80	113.70	25.84	1	3.50	0.00	10.10	3.06	42.50
11	FM 958LL	125.00		125.00	29.30	1	3.50	8.90	0.00	2.29	35.09
12	AFD 2485	36.80	0.00	36.80	8.44	1	0.00	0.00	0.00	3.93	12.37
13	AFD Raider 271	36.80	0.00	36.80	8.19	1	0.00	0.00	0.00	3.93	12.12
14	All Tex Toppick	36.00	0.00	36.00	7.68	1	0.00	0.00	0.00	3.93	11.61
					40" inch rows	3.50/ac		June 9 over-the-top	June 4 over-the-top of all	6.00/hr	
					4.0 seed/row-ft			of Liberty Link variety	Roundup Ready varieties	Time spent Hoeing	
					52,272 seed/ac			35.60/gal	57.00/gal	0.61 hr/ac on RR	
								rate at 1 qt/ac	Roundup WeatherMax	1.36 hrs/ac on conv.	
Base weed control program				chem cost	app cost	total cost			rate at 22 oz/ac	0.31 hrs/ac on LL	
									includes AMS at 0.31/ac	Total hours	
	Pre- and At-planting									hoeing = 25	
18-Feb	1 qt/acre Treflan ppi			6.87	3.50	10.37					
10-May	1.5 pt/acre Direx at planting			2.00	.	2.00					
29-Jun	Cultvation				5.00	5.00					
Total blanket weed control program						17.37					
Insecticide program											
	no insecticides applied										
Harvest aid program											
17-Oct	6 oz/acre Ginstar with			20.91	3.50	24.41					
	21 oz/acre Finish 6										
Total blanket input cost ($/acre)						41.78					

Table 13. Stand counts and nodes above white flower (NAWF) results from the irrigated large plot replicated systems trial, Ricky Bearden Farm, Plains, TX 2004.

Variety	12-Jun		NAWF							Days	
	Plants/row-ft	Plants/acre	28-Jul	4-Aug	11-Aug	18-Aug	25-Aug	2-Sep	9-Sep	to cutout	Cutout date
AFD 2485	3.4	44,083	7.4	7.5	6.3	5.3	5.0	4.7	3.5	104	25-Aug
AFD 3602R	2.4	31,015	8.0	8.2	7.0	5.6	5.2	4.0	3.3	106	27-Aug
All Tex 40801RR	2.2	41,208	7.9	8.0	6.7	5.5	5.2	4.4	3.5	106	27-Aug
All Tex 40802RR	2.6	28,750	7.9	8.1	7.3	6.1	5.5	4.7	3.7	109	30-Aug
All Tex Top-Pick	2.7	33,367	7.4	7.3	6.2	5.2	4.9	4.2	3.7	101	22-Aug
BCG 28R	2.3	35,458	7.8	8.1	6.9	5.7	5.9	4.9	3.7	111	1-Sep
DP 444BG/RR	2.9	29,272	7.2	7.3	6.4	5.4	5.2	4.0	3.0	105	26-Aug
DP 488BG/RR	2.7	38,333	8.2	7.9	7.0	5.8	5.6	4.5	3.7	108	29-Aug
DP 494RR	2.4	35,109	7.9	8.0	6.8	6.0	5.3	4.3	3.5	107	28-Aug
DP 555BG/RR	2.7	31,973	9.2	8.8	7.7	6.6	6.0	5.5	4.6	116	6-Sep
FM 960B2R	2.5	35,196	7.4	7.4	6.3	5.0	4.6	3.9	2.7	97	18-Aug
FM 960RR	2.7	32,234	7.8	7.8	6.4	5.4	4.7	4.0	2.3	101	22-Aug
FM 989B2R	3.0	35,458	7.3	7.2	6.2	5.1	4.2	3.5	2.6	98	19-Aug
PM 2280BG/RR	3.2	38,769	7.5	7.5	6.5	4.9	4.5	3.6	2.9	97	18-Aug
AFD Raider 271	3.2	41,469	7.4	8.2	6.5	5.1	5.5	3.9	3.7	107	28-Aug
ST 2448R	2.5	33,105	7.7	7.7	6.4	5.4	5.0	4.4	3.4	104	25-Aug
ST 5303R	2.0	25,875	6.8	7.4	6.7	5.2	5.1	4.4	2.9	105	26-Aug
ST 5599BR	2.9	37,549	7.7	7.9	6.7	5.6	5.5	4.2	3.2	107	28-Aug
Test average	2.7	34,901	7.7	7.8	6.7	5.5	5.2	4.3	3.3	--	--
CV, %	13.4	13.1	4.4	4.0	5.3	8.9	8.0	8.7	12.7	--	--
OSL	0.0019	0.0016	<0.0001	<0.0001	0.0007	0.0212	0.0003	<0.0001	<0.0001	--	--
LSD 0.05	0.6	7,601	0.6	0.5	0.6	0.8	0.7	0.6	0.7	--	--

NAWF numbers represent an average of 30 plants per variety (10 plants/variety/rep with 3 reps)
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 14. Plant map results from the irrigated large plot replicated systems trial, Ricky Bearden Farm, Plains, TX 2004.

Variety	8-Sep						
	Plant height	Node of first fruiting branch	Fruiting nodes	Mainstem nodes	Height to node	Fruit retention	
						First position	Second position
	inches	node number	total/plant	total/plant	ratio	percent	percent
AFD 2485	29.2	8.1	14.5	21.5	1.33	80.6	56.0
AFD 3602R	31.8	6.0	15.8	20.9	1.53	77.7	63.3
All Tex 40801RR	33.1	6.3	16.1	21.4	1.53	81.6	77.8
All Tex 40802RR	33.9	6.7	15.8	21.5	1.60	87.2	79.8
All Tex Top-Pick	34.7	6.7	14.7	20.4	1.70	81.6	66.9
BCG 28R	28.9	6.2	15.3	20.6	1.40	90.2	71.3
DP 444BG/RR	33.0	6.2	14.3	19.5	1.70	80.6	62.9
DP 488BG/RR	31.1	6.7	14.3	20.0	1.57	82.1	68.1
DP 494RR	31.3	6.7	14.5	20.2	1.57	79.8	60.7
DP 555BG/RR	38.0	8.2	16.3	23.6	1.63	83.2	73.3
FM 960B2R	30.4	7.9	13.0	19.9	1.53	91.1	64.0
FM 960RR	30.8	7.5	13.2	19.7	1.53	88.9	68.4
FM 989B2R	29.0	7.9	14.1	21.0	1.40	80.2	60.1
PM 2280BG/RR	31.3	6.0	15.7	20.8	1.50	79.1	63.2
AFD Raider 271	34.0	6.8	15.9	21.7	1.60	71.6	56.8
ST 2448R	26.5	6.0	15.5	20.4	1.30	71.3	56.8
ST 5303R	37.0	6.4	14.1	19.6	1.90	82.9	65.8
ST 5599BR	36.0	7.0	14.3	20.2	1.80	90.7	72.7
Test average	32.2	6.9	14.9	20.7	1.56	82.2	66.0
CV, %	5.6	5.7	4.5	3.3	5.7	8.5	17.0
OSL	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0384	0.3469
LSD 0.05	3.0	0.7	1.1	1.1	0.15	11.6	NS

Numbers in table represent an average of 18 plants per variety (6 plants/variety/rep with 3 reps).
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 15. Harvest results from the irrigated large plot replicated systems trial, Ricky Bearden Farm, Plains, TX 2004.

Variety	Commercial turnout	Bur cotton yield	Lint yield	Seed yield	Seed	Lint loan value	Lint value	Seed value	Total value	Ginning cost	Systems cost	Net value	
	%	lb/acre	lb/acre	lb/acre	lb/bale	$/lb	$/acre	$/acre	$/acre	$/acre	$/acre	$/acre	
AFD 2485	22.8	4286	977	1768	868	0.4536	443.29	110.48	553.77	96.43	22.12	435.22	a
PM 2280BG/RR	20.9	4643	972	1837	907	0.4381	425.61	114.78	540.39	104.47	46.43	389.50	b
AFD Raider 271	17.3	4624	801	1843	1105	0.4821	386.05	115.19	501.24	104.03	21.57	375.63	b
FM 960B2R	22.3	4171	932	1531	788	0.4618	430.37	95.68	526.05	93.83	57.28	374.94	b
FM 989B2R	22.4	4342	972	1611	796	0.4359	423.59	100.69	524.28	97.69	56.50	370.09	bc
ST 2448R	20.7	4194	867	1666	922	0.4603	399.16	104.14	503.31	94.36	39.44	369.51	bc
DP 444BG/RR	21.8	4472	976	1481	729	0.4432	432.43	92.58	525.01	100.62	59.37	365.01	bc
FM 960RR	22.1	4254	942	1592	811	0.4251	400.46	99.49	499.95	95.72	42.89	361.35	bc
AFD 3602R	20.4	4108	839	1533	878	0.4521	379.15	95.84	475.00	92.44	37.61	344.95	cd
All Tex Top-Pick	22.0	3810	838	1471	842	0.4276	358.34	91.93	450.27	85.73	21.36	343.18	cd
ST 5303R	20.3	3983	807	1487	884	0.4522	364.93	92.95	457.87	89.62	42.81	325.45	de
All Tex 40801RR	20.8	4081	847	1434	813	0.4241	359.23	89.62	448.86	91.82	39.15	317.89	de
BCG 28R	19.7	3888	765	1381	867	0.4554	348.17	86.31	434.48	87.48	37.48	309.52	e
ST 5599BR	21.4	4104	878	1618	885	0.4015	352.41	101.13	453.54	92.33	59.90	301.31	ef
All Tex 40802RR	18.2	3971	722	1438	956	0.4403	317.79	89.88	407.66	89.34	39.15	279.17	fg
DP 494RR	19.7	3531	697	1193	821	0.4415	307.87	74.54	382.42	79.45	45.95	257.03	g
DP 488BG/RR	19.4	3664	712	1235	833	0.4033	286.99	77.19	364.17	82.45	59.37	222.35	h
DP 555BG/RR	20.1	3042	611	1125	885	0.4517	275.70	70.30	346.01	68.44	59.37	218.20	h
Test average	20.7	4065	842	1514	866	0.4417	371.75	94.60	466.35	91.46	43.76	331.13	
LSD (0.05)	--	312	65	116	--	--	28.57	7.27	35.79	7.03	--	28.81	
CV, %	--	4.6	4.7	4.6	--	--	4.6	4.6	4.6	4.6	--	5.2	

Means within a column with the same letter are not significantly different at the 0.05 probability level.
LSD - least significant difference, NS - not significant.

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

Assumes:
$2.25/cwt ginning cost.
$125/ton for seed.
Value for lint based on CCC loan value from commercially ginned bales and USDA-AMS classing results.

Table 16. USDA-AMS classing results of commercially ginned bales from the irrigated large plot replicated systems trial, Ricky Bearden Farm, Plains, TX 2004.

Variety		Color 1	Color 2	Staple	Leaf	Mic	Remarks	Length	Strength	Unif	Loan
		units	units	32nds	units	units	bark	100ths	g/tx	%	$/lb
AFD 3602R	mean	4.0	1.0	34.7	4.3	3.0	6/6 bales	1.08	29.8	79.5	0.4521
	std dev	0.0	0.0	0.5	0.5	0.1		0.02	0.6	0.5	0.0182
All Tex 40801RR	mean	4.0	1.0	33.8	4.5	2.9	6/6 bales	1.06	28.0	79.3	0.4241
	std dev	0.0	0.0	0.8	0.5	0.1		0.02	0.2	0.8	0.0242
All Tex 40802RR	mean	4.0	1.0	35.2	3.8	2.7	5/5 bales	1.10	27.5	79.0	0.4403
	std dev	0.0	0.0	0.4	0.4	0.1		0.01	1.8	1.0	0.0164
BCG 28R	mean	4.0	1.0	34.3	4.2	3.1	6/6 bales	1.07	26.0	78.0	0.4554
	std dev	0.0	0.0	0.8	0.4	0.1		0.03	0.9	1.1	0.0233
DP 488BG/RR	mean	4.0	2.0	34.6	4.0	2.7	5/5 bales	1.08	27.3	77.8	0.4033
	std dev	0.0	0.0	0.5	0.0	0.1		0.02	0.6	1.3	0.0027
DP 444BG/RR	mean	4.0	1.0	34.3	4.0	2.9	7/7 bales	1.07	27.4	79.6	0.4432
	std dev	0.0	0.0	0.5	0.0	0.1		0.02	1.3	0.5	0.0184
DP 494RR	mean	4.0	1.2	34.8	3.8	2.9	5/5 bales	1.09	27.8	79.6	0.4415
	std dev	0.0	0.4	0.4	0.4	0.2		0.01	0.2	0.9	0.0043
DP 555BG/RR	mean	4.0	1.0	36.0	4.0	2.9	5/6 bales	1.13	28.4	79.7	0.4517
	std dev	0.0	0.0	0.0	0.0	0.1		0.00	1.0	0.5	0.0077
PM 2280BG/RR	mean	4.0	1.0	34.3	4.3	2.9	7/7 bales	1.07	29.7	79.9	0.4381
	std dev	0.0	0.0	0.5	0.5	0.1		0.02	1.0	0.7	0.0214
FM 989B2R	mean	3.9	1.0	34.7	3.9	2.7	7/7 bales	1.08	30.0	78.3	0.4359
	std dev	0.4	0.0	0.5	0.4	0.1		0.02	0.7	1.0	0.0150
FM 960B2R	mean	4.0	1.0	36.0	4.0	3.0	7/7 bales	1.13	29.8	79.1	0.4618
	std dev	0.0	0.0	0.6	0.6	0.1		0.02	1.1	0.4	0.0264
FM 960RR	mean	4.0	1.0	35.1	4.6	2.8	7/7 bales	1.10	28.2	78.9	0.4251
	std dev	0.0	0.0	0.4	0.5	0.0		0.01	0.6	0.7	0.0165
ST 5599BR	mean	4.0	2.0	33.7	4.6	2.9	7/7 bales	1.05	27.4	78.4	0.4015
	std dev	0.0	0.0	0.8	0.5	0.1		0.02	0.8	0.5	0.0186
ST 5303R	mean	3.8	1.0	33.3	3.7	3.1	6/6 bales	1.04	29.2	80.5	0.4522
	std dev	0.4	0.0	0.5	0.5	0.1		0.02	1.1	0.5	0.0147
ST 2448R	mean	4.0	1.0	34.0	3.7	3.1	7/7 bales	1.06	28.9	80.4	0.4603
	std dev	0.0	0.0	0.6	0.5	0.1		0.02	1.3	0.5	0.0141
AFD 2485	mean	4.0	1.0	35.9	3.7	2.9	6/7 bales	1.12	30.3	79.1	0.4536
	std dev	0.0	0.0	0.7	0.5	0.0		0.02	0.6	1.2	0.0105
AFD Raider 271	mean	4.0	1.0	36.8	4.2	3.4	5/6 bales	1.15	30.2	80.0	0.4821
	std dev	0.0	0.0	0.4	0.4	0.7		0.01	1.6	0.9	0.0306
All Tex Top-Pick	mean	4.0	1.0	34.0	3.4	2.8	4/5 bales	1.06	26.3	77.2	0.4276
	std dev	0.0	0.0	0.7	0.5	0.0		0.02	1.1	0.8	0.0183

Table 17. Seed and technology expenses* for the irrigated large plot replicated systems trial, Ricky Bearden Farm, Plains, TX 2004

Variety	Seed/lb	Seed/bag	Acres planted /bag	Seed fee $/bag	Tech fee $/bag	Total seed and tech fee $/bag	Seed and tech fee $/acre
AFD 3602R	4,450	222,500	4.26	64.40	37.80	102.20	24.01
All Tex 40801RR	5,000	250,000	4.78	65.00	57.20	122.20	25.55
All Tex 40802RR	5,000	250,000	4.78	65.00	57.20	122.20	25.55
BCG 28R	5,605	280,250	5.36	68.50	59.50	128.00	23.88
DP 444BG/RR	4,500	250,000	4.78	97.50	121.40	218.90	45.77
DP 488BG/RR	5,050	250,000	4.78	97.50	121.40	218.90	45.77
DP 494RR	5,275	250,000	4.78	97.50	57.20	154.70	32.35
DP 555BG/RR	6,300	250,000	4.78	97.50	121.40	218.90	45.77
FM 960B2R	4,188	209,400	4.01	72.95	102.00	174.95	43.68
FM 960RR	4,400	220,000	4.21	72.95	50.30	123.25	29.29
FM 989B2R	4,500	225,000	4.30	72.95	111.70	184.65	42.90
PM 2280BG/RR	4,500	250,000	4.78	55.00	102.00	157.00	32.83
ST 2448R	4,545	230,000	4.40	75.90	37.80	113.70	25.84
ST 5303R	4,400	230,000	4.40	75.90	52.60	128.50	29.21
ST 5599BR	4,300	230,000	4.40	92.00	111.70	203.70	46.30
AFD 2485	4,560	228,000	4.36	36.80	.	36.80	8.44
AFD Raider 271	4,700	235,000	4.50	36.80	.	36.80	8.19
All Tex Top-Pick	4,900	245,000	4.69	36.00	.	36.00	7.68

*Trial was planted at 52,272 seed/acre in 40-inch rows.

Table 18. Expenses incurred for the irrigated large plot replicated systems trial, Ricky Bearden Farm, Plains, TX 2004.										
		Seed	Tech	Total	Seed &	Herb	Herb app	Roundup WeatherMax	Hoe	Systems
	Variety	cost/bag	fees/bag	cost/bag	tech fee/ac	apps	cost/ac	cost/ac	cost/ac	cost/ac
1	AFD 3602R	64.40	37.80	102.20	24.01	1	3.50	10.10	0.00	37.61
2	All Tex 40801RR	65.00	57.20	122.20	25.55	1	3.50	10.10	0.00	39.15
3	All Tex 40802RR	65.00	57.20	122.20	25.55	1	3.50	10.10	0.00	39.15
4	BCG 28R	68.50	59.50	128.00	23.88	1	3.50	10.10	0.00	37.48
5	DP 444BG/RR	97.50	121.40	218.90	45.77	1	3.50	10.10	0.00	59.37
6	DP 488BG/RR	97.50	121.40	218.90	45.77	1	3.50	10.10	0.00	59.37
7	DP 494RR	97.50	57.20	154.70	32.35	1	3.50	10.10	0.00	45.95
8	DP 555BG/RR	97.50	121.40	218.90	45.77	1	3.50	10.10	0.00	59.37
9	FM 960B2R	72.95	102.00	174.95	43.68	1	3.50	10.10	0.00	57.28
10	FM 960RR	72.95	50.30	123.25	29.29	1	3.50	10.10	0.00	42.89
11	FM 989B2R	72.95	111.70	184.65	42.90	1	3.50	10.10	0.00	56.50
12	PM 2280BG/RR	55.00	102.00	157.00	32.83	1	3.50	10.10	0.00	46.43
13	ST 2448R	75.90	37.80	113.70	25.84	1	3.50	10.10	0.00	39.44
14	ST 5303R	75.90	52.60	128.50	29.21	1	3.50	10.10	0.00	42.81
15	ST 5599BR	92.00	111.70	203.70	46.30	1	3.50	10.10	0.00	59.90
16	AFD 2485	36.80	0.00	36.80	8.44	0	0.00	0.00	13.68	22.12
17	AFD Raider 271	36.80	0.00	36.80	8.19	0	0.00	0.00	13.38	21.57
18	All Tex Top-Pick	36.00	0.00	36.00	7.68	0	0.00	0.00	13.68	21.36
					40" inch rows			June 17 over-the-top of all	6.00/hr	
					13,068 row-ft/ac			Roundup Ready varieties	Time spent Hoeing	
					4.0 seed/row-ft			57.00/gal	2.28 hr/ac on conv.	
					52,272 seed/ac			Roundup WeatherMax	Total hours	
								rate at 22 oz/ac	hoeing = 29.8	
Base weed control program		chem cost	app cost	total cost				includes AMS at 0.31/ac		
	Pre- and At-planting									
23-Apr	1 pt/acre Treflan ppi	3.43	3.50	6.93						
13-May	4.0 oz/acre Treflan at planting	0.85		0.85						
	6.0 oz/acre Caparol at planting	1.40		1.40						
	on 12"band									
22-Jul	Blanket Cultvation		5.00	5.00						
Total blanket weed control program				14.18						
Insecticide program										
13-May	3 lb/acre Temik at planting	10.50		10.50						
Harvest aid program										
14-Oct	32 oz/acre Finish 6	17.60	3.50	21.10						
Total blanket input cost ($/acre)				45.78						