

AN ECONOMIC COMPARISON OF FM1735LLB2 TO DP555BR IN COLQUITT COUNTY, GEORGIA 2008

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Introduction

In 2008, over 90% of Georgia's cotton acreage was planted to BR (Bollgard® plus Roundup-Ready®) technology (USDA-AMS, September 2008). Approximately 86% of the state was planted to a single variety, Deltapine 555 BR.

Single-gene Bollgard technology and related variety types (B and BR) will expire September 30, 2009. Because this technology dominates the Georgia cotton landscape and because one variety, DP555BR, accounts for the vast majority of these acres, Georgia producers are concerned about the loss of single-gene technology and more specifically, DP555BR. DP555BR and other single-gene varieties will not be available for purchase after September 30, 2009 (availability in 2010 will be limited to very few remaining stocks booked prior to September 30).

Effective with the 2010 crop, alternatives available to cotton producers will be non-Bt cottons or two-gene cottons, Bollgard II® (B2) or Widestrike® (W). To-date, Georgia producers have not embraced available two-gene technologies; likely due to the yield advantage afforded by DP555BR.

Georgia producers also face increasing/spreading glyphosate resistance in Palmer Amaranth. To combat this resistance, producers can continue to use Roundup-Ready® and Roundup-Ready Flex® (RF) varieties and use residual chemistries in addition to glyphosate for weed control or use Liberty-Link® (LL) Ignite® glufosinate herbicide-resistance varieties.

Objective

With the loss of single-gene Bollgard technology, Georgia producers must find a two-gene or non-Bt (R, RF, or LL) replacement for DP555BR. At this time, the utility of non-Bt varieties is questionable due to the high level of pyrethroid resistance in tobacco budworm (*Heliothis virescens*) in Georgia.

To manage for both glyphosate resistance and pyrethroid resistance, producers could consider the use of B2R, B2RF, W, WR, or WRF varieties in combination with residual chemistries or use LLB2 varieties. The objective of this study was to compare Bayer CropScience FM1735LLB2 to DeltaPine DP555BR. The objectives of this study were to compare these varieties for lint yield, gin turn-out and cottonseed yield, fiber quality, cost of production, and net return.

Materials and Methods

Comparisons were made under both irrigated and non-irrigated production. The irrigated test was conducted at Windy Pond Farm/Tony Lassiter and Kelly Walker, Doerun, GA in Colquitt County. The non-irrigated test was conducted at Perryman Farms/Craig Perryman, Hartsfield, GA in Colquitt County.

Both tests consisted of large strips (plots) of the field. Each plot was approximately the same length within a given location. DP555BR and FM1735LLB2 were planted in alternating strips with a buffer variety (PHY480WR) planted between them (Figure 1). Each strip served as a replication for that variety. The buffer was used to intercept any Ignite or glyphosate drift which might result in injury and impact the results on the test.

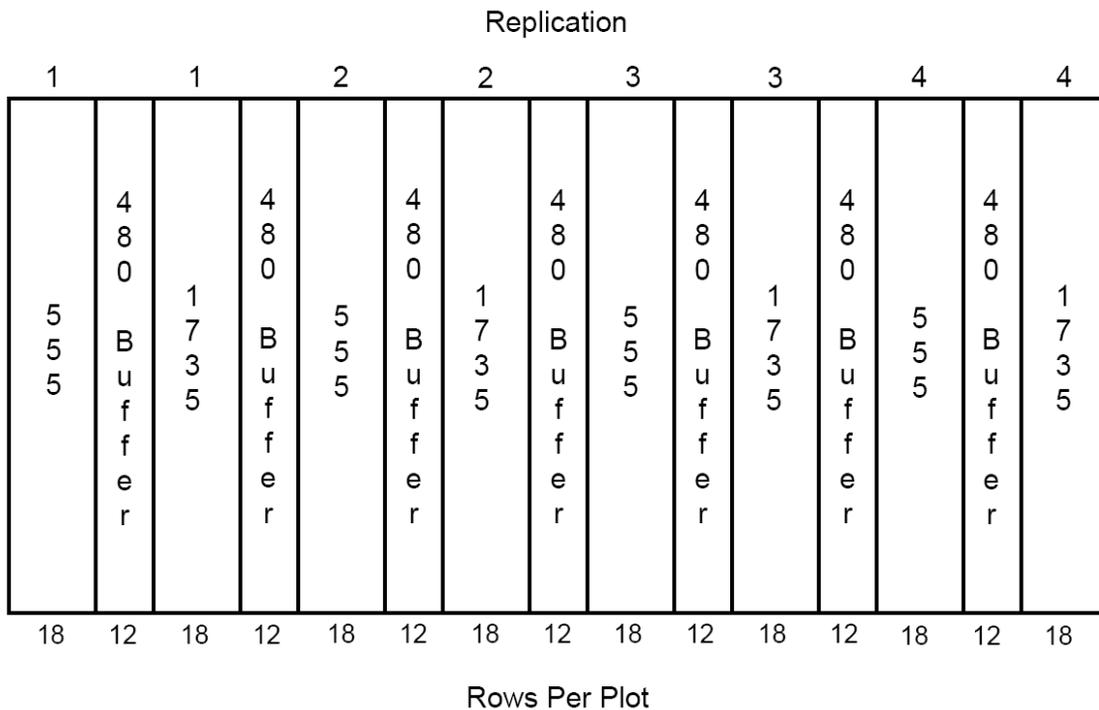


Figure 1. Example of windy pond field strips plot design, 4 of 5 reps shown.

The irrigated test consisted of 5 strips or replications of each variety. Each replication of 555 and 1735 was 18 rows wide. The buffer was 12 rows wide. All 90 rows of each variety (18 rows per plot x 5 reps) was picked, moduled, and ginned commercially. The ginned cotton was HVI classed at the USDA-AMS Classing Office in Macon. Yield per acre was determined by dividing the total ginned lint weight from all plots by the total area (acres) in all 5 plots. Cottonseed yield per acre was also similarly determined.

The non-irrigated test consisted of 3 strips or replications of each variety. Each replication was 12 rows wide. The buffer was 8 rows wide. Only eight rows of each plot (rows 1-4 and 9-12) were picked. The middle 4 rows of each plot were not picked to avoid any possible injury and yield impacts of tractor and sprayer tires and keep all rows

picked uniform. The 8 rows of each rep for each variety were harvested and the seed cotton weighed. The total 24 rows of seed cotton for each variety (8 rows per plot x 3 reps) were then combined in trailers and ginned commercially in total. Lint yield and cotton seed yield for each seed cotton rep was determined based on the gin turn-out and total seed weight for the total 24 rows. The ginned cotton was HVI classed at the USDA-AMS Classing Office in Macon.

Cotton was valued at the November-December 2008 Southeast average spot (cash) price for Color 41/Leaf 4-Staple 34 cotton adjusted for fiber quality premiums and discounts (USDA-AMS). Value also included the November-December average LDP (Loan Deficiency Payment) calculated from weekly rates (USDA-FSA). The November-December average spot price plus LDP was 56.2 cents per pound. This price was then adjusted up or down for fiber quality of the variety.

Cottonseed was valued at the November-December 2008 average price received by Georgia farmers (GASS). The average price was \$191 per ton.

For both irrigated and non-irrigated test, cost and net return was calculated for each variety. When comparing varieties for economic analysis, only costs that are associated with, or due to, variety and technology need to be considered. All other production practices and costs would be the same and thus irrelevant for comparison. Production practices and inputs applied by variety are shown in Tables 1 and 2.

Table 1. Production practices and inputs by variety, irrigated test, Windy Pond Farm.

	DP555BR	FM1735LLB2
Seed	2.5 seed per foot, 36-inch rows, with Dynasty seed treatment	2.5 seed per foot, 36-inch rows, with Trilex seed treatment
Herbicides	Pre-plant: Treflan 1.75 pt/ac impregnated on fertilizer	Pre-plant: Treflan 1.75 pt/ac impregnated on fertilizer
	At Planting: Cotoran 16 oz/ac + Staple .8 oz/ac in 18" band	At Planting: Cotoran 16 oz/ac + Staple .8 oz/ac in 18" band
	Post-OTT: Roundup 22 oz/ac	Post-OTT: Ignite 26 oz/ac
	Post-Directed: Roundup 22 oz/ac + Staple 2 oz/ac	Post-Directed: Ignite 26 oz/ac
	Layby: Diuron 1 qt/ac + MSMA 1 qt/ac + Aim 1.2 oz/ac	Layby: Ignite 26 oz/ac + Diuron 1 qt/ac
Insecticides and PGR	At Planting: Temik 5 lbs/ac	At Planting: Temik 5 lbs/ac
		Post-OTT: Orthene 3.2 oz/ac applied with first Ignite application
	Post-OTT: Stance 3 oz/ac	Post-OTT: Stance 3 oz/ac
	Post-OTT: Bidrin 4 oz/ac + bifenthrin 4 oz/ac + Stance 3 oz/ac	Post-OTT: Bidrin 6 oz/ac
	Post-OTT: Bidrin 4 oz/ac + bifenthrin 5 oz/ac	Post-OTT: Stance 3 oz/ac
	Post-OTT: Stance 3 oz/ac	Post-OTT: Bidrin 6 oz/ac
	Post-OTT: Bidrin 4 oz/ac + bifenthrin 5 oz/ac	Post-OTT: Bidrin 6 oz/ac

In the irrigated test (Table 1), all plots received the same fertilizer prior to planting and through the season including Treflan impregnated on the broadcast fertilizer prior to planting. Both varieties included a seed applied fungicide and were planted in 36-inch rows at 2.5 seed per foot. All plots of both varieties received Temik in-furrow and a banded application of Cotoran and Staple behind the press wheel at planting.

In post-emergence herbicides, DP555BR required the use of more residual chemistry compared to FM1735LLB2. In insecticides, FM1735LLB2 required the use of Orthene for thrips. Compared to FM1735LLB2, a two-gene Bt variety, DP555BR required the use of bifenthrin in addition to Bidrin. DP555BR required 3 applications (9 oz) of plant growth regulator (PGR) Stance compared to 2 applications (6 oz) for FM1735LLB2.

The reason for the thrips control failure in FM1735LLB2 has not been fully determined or explained. All varieties were treated with identical rates of Temik with no difference in application and placement and no equipment malfunction.

In the non-irrigated test (Table 2), all plots received the same fertilizer prior to planting and through the season including Prowl impregnated on the broadcast fertilizer prior to planting. Both varieties included a seed-applied fungicide and were planted in 38-inch rows at 2.1 seed per foot. All plots of both varieties received Temik in-furrow and a banded application of Cotoran and Prowl behind the press wheel at planting.

Post-emergence weed management was similar. Each variety received an over-the-top (OTT) application and directed application at layby. FM1735LLB2 received a second Ignite application plus Diuron and DP555BR received Diuron plus MSMA.

In insecticides, DP555BR required 2 applications of Upcide not needed with the B2 technology. Both varieties received 4 oz (2 applications) of plant growth regulator (PGR) Stance.

Table 2. Production practices and inputs by variety, non-irrigated test, Perryman Farms.

	DP555BR	FM1735LLB2
Seed	2.1 seed per foot, 38-inch rows, with Prevail seed treatment	2.1 seed per foot, 38-inch rows, with Prevail seed treatment
Herbicides	Pre-plant: Prowl 1 qt/ac impregnated on fertilizer	Pre-plant: Prowl 1 qt/ac impregnated on fertilizer
	At Planting: Cotoran 21 oz/ac + Prowl 6 oz/ac in 18" band	At Planting: Cotoran 21 oz/ac + Prowl 6 oz/ac in 18" band
	Post-OTT: Roundup 22 oz/ac	Post-OTT: Ignite 26 oz/ac
	Layby: Diuron 1 qt/ac + MSMA 1 qt/ac	Layby: Ignite 28 oz/ac + Diuron 1 qt/ac
Insecticides and PGR	At Planting: Temik 5 lbs/ac	At Planting: Temik 5 lbs/ac
	Post-OTT: dimethoate 4 oz/ac applied with Roundup application	Post-OTT: dimethoate 4 oz/ac applied with Ignite application
	Post-OTT: Bidrin 4 oz/ac + Upcide 5.33 oz/ac + Stance 2 oz/ac	Post-OTT: Bidrin 6 oz/ac + Stance 2 oz/ac
	Post-OTT: Bidrin 4 oz/ac + Upcide 5.33 oz/ac + Stance 2 oz/ac	Post-OTT: Bidrin 6 oz/ac + Stance 2 oz/ac

For comparison of net returns for DP555BR and FM1735LLB2, costs considered were seed, seed treatment, technology fees, herbicides, insecticides, and PGR as detailed in Tables 1 and 2. The cost of application (variable costs only), fuel and lube, repairs, and labor, was also included. This cost was based on UGA Cooperative Extension cotton estimated costs of production (Shurley and Ziehl). An application cost was not charged when herbicide or insecticide was applied with another operation that had to be done anyway, such as planting or spreading fertilizer. All other inputs and production practices were the same for both varieties thus, for the purpose of comparing the difference in net returns, are irrelevant.

Ginning, warehouse, storage, and marketing, classing, and promotions (state and national check-off fees) were also considered since they are yield-related. These costs were 8.5 cents per lb for ginning plus \$15.30 per bale (bale weight was assumed to be 500 lbs). This cost was deducted from the value of cottonseed and the difference, if positive, was added to lint income or deducted from lint income, if negative.

Results and Discussion

Yield and Fiber Quality

In the irrigated test, FM1735LLB2 yielded equivalent to DP555BR (Table 3). Cottonseed production was almost 150 lbs per acre higher for FM1735LLB2. Fiber quality was better for FM1735LLB2 as it graded better on fiber length (Staple) and fiber length Uniformity. Color and Leaf grades were similar. FM1735LLB2 averaged higher in fiber Strength. The November-December 2008 “base quality” price plus LDP was 56.2 cents per pound. FM1735LLB2 had a high percentage of bales receive a premium for quality but some bales received a discount. On average, there was no premium or discount for FM1735LLB2 but it still graded 1.1 cents per pound higher than DP555BR.

Table 3. Yield and quality comparisons of DP555BR and FM1735LLB2.

	Irrigated		Non-Irrigated	
	DP555BR	FM1735LLB2	DP555BR	FM1735LLB2
Lint Yield Per Acre	1,329	1,339	741	621
Cottonseed Yield Per Acre	1,581	1,727	897	866
Seed:Lint	1.19	1.29	1.21	1.39
Average Color Grade (C1)	4.00	4.00	3.00	3.15
Average Color Grade (C2)	1.00	1.00	1.00	1.00
Average Leaf Grade	3.65	3.80	2.93	3.00
Average Staple	33.75	34.39	32.84	33.30
Average Micronaire	4.56	4.47	5.12	5.00
Average Strength	27.49	28.61	27.96	28.07
Average Uniformity	79.34	80.89	79.86	80.29
Average Cash Value Per Lb	\$0.5510	\$0.5620	\$0.5250	\$0.5341

In the non-irrigated test, DP555BR out-yielded FM1735LLB2 by 120 lbs per acre. Cottonseed yield for FM1735LLB2 was less than DP555BR due to the lower lint yield although FM1735LLB2 had higher seed per lb of lint.

Both varieties graded poorly due to drought. Color and Leaf grades were good but Staple was short and Micronaire was high. Uniformity was also a problem. DP555BR

averaged 3.7 cents per lb discount for quality. FM1735LLB2 averaged 2.79 cents per lb discount. FM1735LLB2 graded 0.91 cents per lb higher than DP555BR.

Costs and Net Returns

In the irrigated test, Lint Value per acre was about \$30 per acre higher for FM1735LLB2. Yield was essentially the same but lint value was higher due mostly to higher fiber quality (Table 4). Higher cottonseed yield for FM1735LLB2 more than offset the cost of ginning, warehousing, storage, etc. (GWSM) and gave a net return to income of \$10.14 per acre based on \$191 per ton for seed. The net cost of GWSM for DP555BR was \$2.64 per acre or 0.2 cents per lb.

In the irrigated test, the cost of seed and tech fees, insecticides, herbicides, PGR and application totaled \$186.33 per acre for DP555BR compared to \$166.69 for FM1735LLB2. Net return was \$52.66 per acre higher for FM1735LLB2. This can be attributed primarily to higher cottonseed weight (yield) and less expensive weed and insect control.

Table 4. Seed and technology related costs and net returns by variety.

	Irrigated		Non-Irrigated	
	DP555BR	FM1735LLB2	DP555BR	FM1735LLB2
Lint Yield	1,329	1,339	741	621
Price Per Pound	\$0.5510	\$0.5620	\$0.5250	\$0.5341
Lint Value Per Acre	\$732.28	\$752.52	\$389.03	\$331.68
Cottonseed Yield	1,581	1,727	897	866
Price Per Ton	\$191.00	\$191.00	\$191.00	\$191.00
Seed Value Per Acre	\$150.99	\$164.93	\$85.66	\$82.70
GWSM	\$153.63	\$154.79	\$85.66	\$71.79
Net Cost(-) or Gain(+)	-\$2.64	\$10.14	\$0.00	\$10.91
Seed and Tech Fees	\$65.48	\$62.04	\$48.23	\$45.67
Insecticides	\$36.50	\$28.61	\$25.96	\$23.90
Herbicides	\$51.09	\$45.69	\$28.74	\$37.35
PGR	\$8.73	\$5.82	\$3.88	\$3.88
Application	\$24.53	\$24.53	\$12.05	\$12.05
Total Related Costs	\$186.33	\$166.69	\$118.86	\$122.85
Net Return	\$543.31	\$595.97	\$270.17	\$219.74

In the non-irrigated test, Lint Value was \$57.35 per acre less for FM1735LLB2. Although fiber quality was higher, the difference in yield resulted in higher Value for DP555BR. Due to higher cottonseed yield per pound of lint, FM1735LLB2 resulted in a net gain above the cost of ginning, etc. (GWSM). Accounting for this, the difference in combined lint and seed income was \$46.44 per acre higher for DP555BR.

In the non-irrigated test, costs were similar. FM1735LLB2 was less costly for seed and technology fees and insecticides but more costly for herbicides. DP555BR, in total, was approximately \$4.00 per acre less in production cost than FM1735LLB2. Net return was approximately \$50 per acre higher for DP555BR compared to FM1735LLB2. Although costs were similar and FM1735LLB2 yielded more seed per pound of lint, the difference in yield resulted in higher net return for DP555BR.

Summary

Single-gene Bollgard® technology and related variety types (B and BR) expire September 30, 2009. Georgia producers also face increasing/spreading glyphosate resistance in Palmer Amaranth. Georgia producers must find a two-gene or non-Bt replacement for DP555BR. To do this and also manage for glyphosate resistance, producers could consider the use of B2R, B2RF, W, WR, or WRF varieties in

conjunction with the use of residual chemistries or use LLB2 varieties. The objective of this study was to compare Bayer CropScience FM1735LLB2 to DeltaPine DP555BR. The comparison was made under both irrigated and non-irrigated production. The irrigated test was conducted at Windy Pond Farm/Tony Lassiter and Kelly Walker, Doerun, GA in Colquitt County. The non-irrigated test was conducted at Perryman Farms/Craig Perryman, Hartsfield, GA in Colquitt County.

In the irrigated test, FM1735LLB2 yielded equivalent to DP555BR. Fiber quality was better for FM1735LLB2. The cost of seed and tech fees, insecticides, herbicides, PGR and application costs totaled \$186.33 per acre for DP555BR compared to \$166.69 for FM1735LLB2. Net return was \$52.66 per acre higher for FM1735LLB2. This can be attributed primarily to higher cottonseed weight (yield) and less expensive weed and insect control.

In the non-irrigated test, DP555BR out-yielded FM1735LLB2 by 120 lbs per acre. Both varieties graded poorly due to drought. Lint Value was \$57.35 per acre less for FM1735LLB2. Although fiber quality was higher for FM1735LLB2, the difference in yield resulted in higher Value for DP555BR. Costs were similar. FM1735LLB2 was less costly for seed and technology fees and insecticides but more costly for herbicides. Net return was approximately \$50 per acre higher for DP555BR compared to FM1735LLB2. Although costs were similar and FM1735LLB2 yielded more seed per pound of lint, the difference in yield resulted in higher net return for DP555BR.

This test used FM1735LLB2. This variety will be replaced by FM1845LLB2. FM1735LLB2 will be phased out beginning in 2010 but may be available beyond 2010.

Acknowledgements

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Literature Cited

GASS (Georgia Agricultural Statistics Service) USDA, *Farm Report*, January 2009 and February 2009.

Shurley, Don and Amanda Ziehl. *2008 Cotton Budgets*, Department of Agricultural and Applied Economics, University of Georgia, December 2007.

USDA Agricultural Marketing Service (AMS), *Cotton Varieties Planted 2008 Crop*, September 2008.

USDA Agricultural Marketing Service (AMS), *Cotton Price Statistics*, November 2008 and December 2008.

USDA Farm Service Agency (FSA), *Cotton LDP Rates*, Weekly historical data available on-line at www.fsa.usda.gov.