DP 141 B2RF, A NEW MID-MATURITY, HIGH QUALITY VARIETY

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Abstract

DP 141 B2RF is a new mid-full maturing cotton variety being released by Delta and Pine Land (D&PL) for the 2008-growing season. DP 141 B2RF is a medium plant with semi-smooth leaves and good storm tolerance. The yield, crop value, and gin turnout of DP 141 B2RF were not significantly different than any of the three varieties used for comparison (DP 143 B2RF, PHY 485 WRF, and FM 9063 B2F). The fiber length of DP 141 B2RF was significantly longer and the micronaire significantly lower than PHY 485 WRF. Fiber strength was significantly stronger than DP 143 B2RF. The regional yield performance of DP 141 B2RF was strongest in the South Delta when compared to DP 143 B2RF and PHY 485 WRF and in the Southern southeast when compared to DP 143 B2RF, PHY 485 WRF, and FM 9063 B2F. Seed supply is expected to be good for commercial introduction on 2008.

Introduction

DP 141 B2RF will be released as a new mid-full maturing Bollgard II®/Roundup Ready® Flex variety for the 2008 growing season. DP 141 B2RF was tested as DPLX 04X403DF, prior to being given the commercial name DP 141 B2RF. DP 141 B2RF was developed by Albert Santos, Don Keim, and Doug Shoemaker at the Delta and Pine Land Scott, MS breeding station. Testing in University Official Variety Trials (OVTs) and D&PL Agronomic Services Trials (ASTs) were initiated in 2007.

Methods and Materials

The data describing DP 141 B2RF here was extracted from the D&PL Agronomic Information System database on December 18, 2007. This database contains both public data from university OVTs and Delta and Pine Land Company tests from the Research and Technical Services departments. The data extracted from the data base includes yield and HVI fiber data to calculate "loan value" based on the 2007 USDA loan chart, using a base value of $0.52/lb. Comparisons for yield and fiber quality were made with DP 143 B2RF, PHY 485 WRF, and FM 99063 B2F, and were all balanced head to head comparisons for all locations included. Crop value per acre was calculated by multiplying the lint yield for each plot by the USDA loan value calculated for that plot. Plant mapping data for maturity comparisons was collected at selected D&PL Technical Services plot sites. The data was collected near maturity when the plants had 30 to 70 percent open bolls. A balanced, head to head comparisons of the plant mapping data were made against DP 143 B2RF and DP 164 B2RF.

Results and discussions

General Characteristics and Plant Growth

DP 141 B2RF is a mid-full maturing variety with semi-smooth leaves and a medium plant type (Table 1). Seed size can range from 5200 to 5300 seed per pound and storm resistance is rated at 5 on a scale of 1 (loose) to 10 (high plains).

Table 1. Characteristics of DP 141 B2RF

Characteristics	*Description or Rating*
Experimental Designation	DPLX 04X403DF
Breeders	Albert Santos, Don Keim, Doug Shoemaker
Maturity	Mid-full
Plant Height	Medium
Leaf Hair	Semi-smooth
Seed Size (#/lb)	5000-5500
Storm Resist.	5 (1=loose, 10=tight)

Plant mapping comparisons between DP 141 B2RF, DP 143 B2RF, and DP 161 B2RF from 47 locations in 2007 indicate no significant differences in plant height, total nodes, fruiting nodes, height to node ratio, node of the first fruiting branch, and the maturity/boll opening measures (NUCB, NUHB, and DD60's to 100% open).

Table 2. Plant mapping parameters for DP 141 B2RF, DP 143 B2RF, and DP 161 B2RF averaged over 47 locations of D&PL trials across the Cotton Belt in 2007.

Variety	*Plant Height (in)*	*Total Nodes*	*Fruiting Nodes*	*Height-to-Node Ratio (in/inter-node)*	*Node of 1st Fruiting Branch*	*Node of Upper most Cracked Boll*	*Node of Upper-most Harvest-able Boll*	*DD60s to reach 100% open¶*
DP 141 B2 RF	36.0	19.6	9.7	1.8	6.0	10.9	14.7	191.6
DP 143 B2RF	35.0	19.4	9.6	1.8	6.0	11.3	14.6	162.3
DP 161 B2RF	36.8	19.5	9.7	1.9	6.2	11.2	14.8	182.0
$LSD_{(0.05)}$†	NS	NS	NS	NS	NS	NS	NS	NS

† Least significant difference at the alpha=0.05 level; ns=not significant.
¶ Calculated as the number of fruiting nodes between the uppermost cracked boll and the uppermost harvestable boll multiplied by 50 DD60s/node.

Yield, Fiber Quality, and Crop Value

The yield and HVI fiber quality of DP 141 B2RF compared to two commercial Bollgard II®/ Roundup Ready Flex varieties (DP 143 B2RF and FM 9063 B2RF) and one WideStrike/Roundup Ready Flex variety (PHY 485 WRF) are summarized in Table 3. The yield performance, crop value, and turnout of DP 141 B2RF were not significantly different than any of the three comparison varieties. The fiber length of DP 141 B2RF was significantly longer than PHY 485 WRF (3.7% difference), but similar to DP 143 B2RF and FM 9063 B2F. Micronaire for DP 141 B2RF was statistically similar to FM 9063 B2F, significantly higher than DP 143 B2RF, and significantly lower than PHY 485 WRF. Fiber strength of DP 141 B2RF was statistically higher than DP 143 B2RF, but similar to PHY 485 WRF and FM 9063 B2F. The fiber length uniformity and loan value for DP 141 B2RF was similar to all three comparison varieties.

Table 3. Head to Head Yield and HVI Performance of DP 141 B2RF compared to D&PL and other competitor Bollgard II®/Roundup Ready Flex and Widestrike™/Roundup Ready Flex varieties. Data includes both D&PL AST data and University OVT data from D&PL AIS data base as of 12.18.07.

Variety	*Crop Value ($/acre)*	*Yield (lbs/acre)*	*% Gin Turn Out*	*Fiber Length (32nd inch)*	*Micro-naire*	*Strength (g/tex)*	*Uniformity Index (%)*	*Loan Value† (cents/lb)*
DP 141 B2RF	582	1053	35.5	37.1	4.10	28.7	81.0	54.43
DP 143 B2RF	578	1060	35.3	37.2	3.98	27.8	80.7	54.04
n	184	219	219	185	185	184	185	184
t-Test‡	NS	NS	NS	NS	**	***	NS	NS
% Difference	0.6	-0.7	0.4	0.2	3.1	3.2	0.4	0.7
DP 141 B2RF	535	1004	36.7	36.8	4.21	28.4	80.9	54.06
PHY 485 WRF	528	1038	36.8	35.5	4.52	28.7	82.7	52.54
n	64	86	86	65	64	64	65	64
t-Test	NS	NS	NS	***	***	NS	NS	NS
% Difference	1.4	-3.3	-0.5	3.7	-7.0	-1.0	-2.2	2.9
DP 141 B2RF	660	1144	36.4	37.8	4.00	28.9	81.4	55.47
FM 9063 B2F	657	1150	35.9	37.6	4.13	29.7	82.2	55.89
n	30	48	48	31	31	30	31	30
t-Test	NS	NS	NS	NS	NS	NS	NS	NS
% Difference	0.5	-0.5	1.4	0.5	-3.0	-2.6	-0.9	-0.8

† Based on 2007 USDA CCC loan value of $0.52/lb +/- premiums and discounts, expressed as $/acre gross revenue. Data are means of crop value of individual plots. Base leaf grade, color grade, and uniformity values were used in the crop value calculation for data points for which those data were not reported by the cooperator.
‡ Prob >|t| that values for each variety are not different; *, **, *** indicate significance at alpha = 0.05, 0.01, 0.001, respectively; ns=not significant.

Yield Performance by Production Area

Head-to-head comparisons between DP 141 B2RF, DP 143 B2RF, PHY 485 WRF and FM 9063 B2F by production areas throughout the U.S. cotton belt are presented individually in Tables 4 through 6. Production areas are listed in descending order in a general west-to-east manner.

DP 141 B2RF yielded numerically higher than DP 143 B2RF in the, rolling plains (portions of TX and OK), south delta (southern AR, LA, and south MS), and southern southeast (southern AL, FL, GA, and southern SC). Statistically, however, yields in all eight production areas listed in Table 4 were not different between the two varieties.

Table 4. Head-to-head comparisons for DP 141 B2RF and DP 143 B2RF in eight cotton production areas. Data are from all 2006-2007 D&PL agronomic service and research trials, university variety trials, extension county agent trials, and consultant trials in each of those geographies, as of 18 December 2007.

Production Area†	Variety			
	DP 141 B2RF	***DP 143 B2RF***	***# locations***	***T test***‡
	----------Lbs. Lint/Acre----------			
High Plains	1252	1320	25	NS
Rolling Plains	1227	1217	13	NS
Central TX	1016	1053	8	NS
South TX	792	813	15	NS
South Delta	1132	1099	28	NS
North Delta	876	899	54	NS
Southern Southeast	1211	1147	37	NS
Northern Southeast	903	913	25	NS

† High Plains=northern high plains (portions of TX, OK, and KS), and southern high plains (portions of TX); Rolling Plains=portions of TX and OK; Central TX= central and east TX; South TX=lower Rio Grande valley northward to the upper coast of TX; South Delta=southern AR, LA, and southern MS; North Delta=northern AL, northern AR, MO, northern MS, and TN; Southern Southeast=southern AL, FL, GA, and southern SC; Northern Southeast=NC, northern SC, and VA.
‡ Prob >|t| that values for each variety are not different; ns=not significant.

Numerically higher yield were produced by DP 141 B2RF versus PHY 485 WRF in the south delta (southern AR, LA, and south MS), and southern southeast (southern AL, FL, GA, and southern SC). Statistically, however, yields in all five production areas listed in Table 5 were not different between the two varieties.

Table 5. Head-to-head comparisons for DP 141 B2RF and PHY 485 WRF in five cotton production areas. Data are from all 2006-2007 D&PL agronomic service and research trials, university variety trials, extension county agent trials, and consultant trials in each of those geographies, as of 18 December 2007.

Production Area†	Variety			
	DP 141 B2RF	***PHY 485 WRF***	***# locations***	***T test***‡
	----------Lbs. Lint/Acre----------			
South TX	743	829	11	NS
South Delta	1073	1051	10	NS
North Delta	981	1044	28	NS
Southern Southeast	1185	1161	20	NS
Northern Southeast	857	953	12	NS

† South TX=lower Rio Grande valley northward to the upper coast of TX; South Delta=southern AR, LA, and southern MS; North Delta=northern AL, northern AR, MO, northern MS, and TN; Southern Southeast=southern AL, FL, GA, and southern SC; Northern Southeast=NC, northern SC, and VA.
‡ Prob >|t| that values for each variety are not different; ns=not significant.

DP 141 B2RF yielded numerically higher than FM 9063 B2F in the high plains (northern high plains portions of TX, OK, and KS), south Texas (lower Rio Grande valley northward to the upper coast of TX), and southern southeast (southern AL, FL, GA, and southern SC). Statistically, however, yields in all five production areas listed in Table 6 were not different between the two varieties.

Table 6. Head-to-head comparisons for DP 141 B2RF and FM 9063 B2F in five cotton production areas. Data are from all 2006-2007 D&PL agronomic service and research trials, university variety trials, extension county agent trials, and consultant trials in each of those geographies, as of 18 December 2007.

Production Area†	Variety			
	DP 141 B2RF	***FM 9063 B2F***	***# locations***	***T test***‡
	----------Lbs. Lint/Acre----------			
High Plains	1509	1466	9	NS
South TX	832	817	8	NS
North Delta	1200	1255	9	NS
Southern Southeast	1140	1123	10	NS
Northern Southeast	866	861	6	NS

† High Plains=northern high plains (portions of TX, OK, and KS), South TX=lower Rio Grande valley northward to the upper coast of TX; North Delta=northern AL, northern AR, MO, northern MS, and TN; Southern Southeast=southern AL, FL, GA, and southern SC; Northern Southeast=NC, northern SC, and VA.
‡ Prob >|t| that values for each variety are not different; ns=not significant.

Summary

DP 141 B2RF is a new mid-full maturing Bollgard II®/Roundup Ready Flex variety from D&PL. The growth and fruiting pattern of DP 141 B2RF is similar to DP 143 B2RF and DP 161 B2RF. The yield, crop value, and gin turnout of DP 141 B2RF was found to be similar to the 3 comparison varieties (DP 143 B2RF, PHY 485 WRF, and FM 9063 B2F). The fiber length was significantly longer than PHY 485 WRF. The micronaire of DP 141 B2RF was significantly lower than PHY 485 WRF and higher than DP 143 B2RF. Fiber strength was significantly greater than DP 143 B2RF. The regional yield performance of DP 141 B2RF was strongest in the South Delta when compared to DP 143 B2RF and PHY 485 WRF and in the Southern southeast when compared to DP 143 B2RF, PHY 485 WRF, and FM 9063 B2F. Seed supply is expected to be good for commercial introduction in 2008.

Acknowledgements

The authors would like to recognize the efforts and talents of the Delta and Pine Land research and technical services staff across the U.S. who collected the data and processed many samples from numerous variety trials. Our thanks also go to the many grower cooperators who provided land and time to accommodate these studies.