DELTAPINE[®] NEW CLASS OF '13 EARLY MATURING VARIETIES: DP 1311 B2RF AND DP 1321 B2RF Greg Ferguson Monsanto Madison, MS David W. Albers Monsanto Company Saint Louis, MO

<u>Abstract</u>

DP 1311 B2RF is a Genuity[®] Bollgard II[®] Roundup Ready[®] Flex cotton product. This early maturing variety has potential for excellent lint yield and fiber quality that will be released for commercial sales in the 2013 growing season. This variety has a light hairy leaf pubescence with a medium plant height. Average fiber properties of DP 1311 B2RF include fiber length of 1.15 inches, 4.4 micronaire, 30.1 g/tex fiber strength and 82 percent uniformity. DP 1311 B2RF is rated very good for storm resistance, similar to DP 1044 B2RF.

DP 1321 B2RF is an early to mid maturing variety that will also be released for commercial sales in the 2013 growing season. This variety has semi-smooth leaf pubescence with a medium to tall plant height. Average fiber properties of DP 1321 B2RF include fiber length of 1.14 inches, 4.7 micronaire, 31.2 g/tex fiber strength, and 83.2 percent uniformity. DP 1321 B2RF has a higher storm resistance when compared to DP 0912 B2RF.

Introduction

In 2013, Deltapine[®] brand is releasing for commercial introduction, a new early maturing variety, DP 1311 B2RF and a new early to mid maturing variety, DP 1321 B2RF which both contain the Genuity[®] Bollgard II[®] and Roundup Ready[®] Flex traits. The characteristics describing DP 1311 B2RF and DP 1321 B2RF are summarized in Table 1. The highlights of DP 1311 B2RF are outstanding yield potential, fiber quality, and micronaire stability to avoid quality discounts from high micronaire values. DP 1311 B2RF has the maturity and performance which makes it a great fit for the Midsouth region. The new variety DP 1321 B2RF is an excellent fit for the Northern tier of the cotton belt and in West Texas markets featuring excellent fiber quality when compared to similar early to mid season varieties of Deltapine brand products and competitive check varieties.

Trait	DP 1311 B2RF	DP 1321 B2RF
Maturity	Early	Early to Mid
Leaf Pubescence	Light Hairy	Semi-smooth
Plant Height	Medium	Medium to Tall
Seed Size	5500 – 6500 seed / lb	4900 – 5100 seed / lb
Micronaire	4.4	4.7
Length	1.15 inches	1.14 inches
Strength	30.1 g/tex	31.2 g/tex
Uniformity	82%	83.2%
Lint Percent	40.8%	39.6%
Node First Fruiting Branch	6.5	6.0
Rating and meas	urements from 2012 Monsant	to Trials

Table 1. DP 1311 B2RF and DP 1321 B2RF Characteristics and Fiber Quality

Materials and Methods

The data describing DP 1311 B2RF and DP 1321 B2RF (along with internal and competitive check varieties) was obtained from the following sources: Monsanto breeder trials, Monsanto on-farm trials, and University trials. Plant growth, fruiting, and maturity comparisons were made by plant mapping a subset of the Monsanto on-farm trials when approximately 50% of the bolls were open. All available yield, fiber quality, and plant mapping data were queried on the dates noted in each data table for these analyses.

Results and Discussion

DP 1311 B2RF Plant Mapping Comparisons

The growth and fruiting characteristics of DP 1311 B2RF, as measured by end-of-season plant mapping, are summarized in Table 2. The growth and fruiting variables of DP 1311 B2RF are similar to DP 0912 B2RF, with the exception of vigor, node of first fruiting branch, and fall out and string out rating all of which had a significantly higher rating when compared to DP 0912 B2RF (Table 2). DP 1311 B2RF requires a similar number of DD60s compared to DP 0912 B2RF to achieve 100% open boll. DP 1311 B2RF is characterized as an early maturity variety, with a slightly shorter plant height than DP 0912 B2RF.

Table 2. Plant mapping comparison of DP 1311 B2RF and DP 0912 B2RF in Monsanto Trials (2011-2012) in Midsouth/Southeast regions.

	DP 1311 B2RF	DP 0912 B2RF					
Plant Height (inches)	38.3	39.3					
Total Nodes	20.7	20.6					
Number of Fruiting Nodes	10.7	10.7					
% Est Open	60.5%	58.4%					
Node of First Fruiting Branch	6.5*	6.1					
DD60's to 100% open	-14.8	0					
Vigor	4*	3.3					
Fall Out Rating	1.65*	2.35					
String Out Rating	1.99*	4.05					
Data source: Midsouth/Southea	st In-Season data 2011-2012						
*Significantly different than DP 0912 B2RF							
Fall Out and String Out Rating:	1=Tight, Storm-Proof boll; 9	=Loose boll					

DP 1311 B2RF Yield, Fiber Quality, and Value Comparisons

DP 1311 B2RF was compared to DP 0912 B2F in testing conducted in the Midsouth region. DP 1311 B2RF showed improvements over DP 0912 B2RF in (increase of 2.5 percent) and fiber length (increase of 0.02 inches) (Table 3). DP 1311 B2RF has a significantly lower micronaire value when compared to DP 0912 B2RF (decrease of 0.4), which can greatly the risk of high micronaire discounts (above 5.0). The new variety DP 1311 B2RF provides a similar fit when compared to DP 0912 B2RF in the Midsouth region.

Table 3. Lint Yield, Lint %, Fiber Length, Micronaire, Fiber Strength, and Uniformity Index comparisons of DP 1311 B2RF and DP 0912 B2RF in the Midsouth region, 2011–2012.

	Lint				Fiber			
	Yield		Fiber		Strength	Uniformity		
Variety	(lb/acre)	Lint %	Length	Micronaire	(g/tex)	Index		
DP 1311 B2RF	1333	40.3	1.14	4.3	30.2	82.42		
DP 0912 B2RF	1288	37.8	1.12	4.7	30.7	82.75		
Significance	*	**	**	**	**	*		
Observations	104	97	65	65	65	65		
Years	2	2	2	2	2	2		
Significance levels der	noted by $+ =$	0.1; * = 0.0	05; ** = 0.01	l alpha error le	evels.			
Data Source: All Monsanto (Breeding, Tech Development, Commercial) and public trials								
available for the year a	and geograpl	ny listed						

The improvements in DP 1311 B2RF over ST 5458B2RF in testing conducted in the Midsouth region were lint yield (increase of 99.82 lb/acre), lint percent (increase of 3.04 percent), and uniformity index (increase of 0.28 percent). DP 1311 B2RF had lower micronaire, fiber strength, and fiber length when compared to ST 5458B2RF (Table 4).

The improved production of DP 1311 B2RF gives growers a higher quantity option for the Midsouth market that fit the early maturing varieties.

	Lint				Fiber	
	Yield		Fiber		Strength	Uniformity
Variety	(lb/acre)	Lint %	Length	Micronaire	(g/tex)	Index
DP 1311 B2RF	1351	41.0	1.14	4.5	29.8	82.78
ST 5458B2RF	1251	37.9	1.15	4.8	32.1	82.5
Significance	**	**	*	**	**	+
Observations	72	68	35	35	35	35
% Wins	65	93	28	86	3	65
Significance levels der	noted by $+=$	= 0.1; * = 0.0	05; ** = 0.01	l alpha error le	evels.	
Data Source: All Mon	santo (Breed	ling, Tech D	evelopment	, Commercial) and public	trials
available for the year a	and geograph	hy listed				

Table 4. Lint Yield, Lint %, Fiber Length	n, Micronaire, F	Fiber Strength,	and Uniformity	Index comparisons of
DP 1311 B2RF and ST 5458B2RF in the M	idsouth region 20	2009–2012.		

DP 1321 B2RF Plant Mapping Comparisons

The growth and fruiting characteristics of DP 1321 B2RF, as measured by end-of-season plant mapping, are summarized in Table 6. When comparing the growth and fruiting variables of DP 1321 B2RF to DP 0912 B2RF, DP 1321 B2RF has a higher vigor rating, a taller plant height, more total nodes and number of fruiting node and a higher fall out and string out rating (Table 5). DP 1321 B2RF requires approximately 28 more DD60s than DP 0912 B2RF to achieve 100% open boll. DP 1321 B2RF is characterized as an early to mid maturing variety, with a taller plant height than DP 0912 B2RF.

Table 5. Plant mapping comparison of DP 1321 B2RF and DP 0912 B2RF in Monsanto Trials (2011-2012) in the Midsouth region.

	DP 1321 B2RF	DP 0912 B2RF					
Vigor	3.6*	3.3					
Plant Height (inches)	41.3*	39.3					
Total Nodes	21.3*	20.6					
Number of Fruiting Nodes	11.7*	10.7					
% Est Open	58.5%	58.4%					
Node of First Fruiting Branch	6	6.1					
DD60's to 100% open	+28	0					
Fall Out Rating	2.05*	2.35					
String Out Rating	2.99*	4.05					
Data source: Midsouth/Southea	st In-Season data 2011-2012						
*Significantly different than DP 0912 B2RF							
Fall Out and String Out Rating:	1=Tight, Storm-Proof boll; 9	=Loose boll					

DP 1321 B2RF Yield, Fiber Quality, and Value Comparisons

DP 1321 B2RF was compared to DP 0912 B2RF in testing conducted in the Midsouth region in 2009 to 2012. DP 1321 B2RF showed improvements over DP 0912 B2RF in lint percent (increase of 1.63 percent), fiber length (increase of 0.03 inches), strength (increase of 1.31 g/tex), and uniformity index (increase of 0.69 percent), with reduced micronaire. (Table 6). The improved fiber quality of DP 1321 B2RF gives growers additional options in the Midsouth market for early to mid maturing varieties.

	Lint				Fiber	
	Yield		Fiber		Strength	Uniformity
Variety	(lb/acre)	Lint %	Length	Micronaire	(g/tex)	Index
DP 1321 B2RF	1256	39.6	1.16	4.7	32.2	83.88
DP 0912 B2RF	1246	38	1.13	4.8	30.9	83.19
Significance		**	**	**	**	**
Observations	rvations 91 83 53 53 53 53					
% Wins	50	85	94	73	88	79
Significance levels der	noted by $+ =$	= 0.1; * = 0.0	05; ** = 0.01	l alpha error le	evels.	
Data Source: All Mon	santo (Breed	ling, Tech D	evelopment	, Commercial) and public	trials
available for the year a	and geograph	hy listed				

Table 6. Lint Yield, Lint %, Fiber Length, Micronaire, Fiber Strength, and Uniformity Index comparisons of DP 1321 B2RF and DP 0912 B2RF in the Midsouth region, 2009–2012.

DP 1321 B2RF was also compared to DP 0912 B2RF in testing conducted in the Northern Tier of the Midsouth and Southeast region in 2009 to 2012. DP 1321 B2RF showed improvements over DP 0912 B2RF for lint percent (increase of 1.46 percent), fiber length (increase of 0.03 inches), strength (increase of 1.15 g/tex) and uniformity index (increase of 0.73 percent), with reduced micronaire (Table 7).

Table 7. Lir	nt Yield,	Lint %,	Fiber	Length,	Micronaire,	Fiber	Strength,	and	Uniformity	Index	comparisons	of
DP 1321 B21	RF and 1	DP 0912 H	32RF in	n the Nor	rthern Tier of	the M	lidsouth an	d So	utheast regio	on, 200	9–2012.	

	Lint				Fiber			
	Yield		Fiber		Strength	Uniformity		
Variety	(lb/acre)	Lint %	Length	Micronaire	(g/tex)	Index		
DP 1321 B2RF	1256	40.4	1.15	4.8	31.7	83.64		
DP 0912 B2RF	1269	39.0	1.11	4.9	30.5	82.91		
Significance		**	**	**	**	**		
Observations	108	98	68	68	68	68		
% Wins	44	86	91	75	85	79		
Significance levels der	noted by $+ =$	= 0.1; * = 0.0	05; ** = 0.01	alpha error le	evels.			
Data Source: All Monsanto (Breeding, Tech Development, Commercial) and public trials								
available for the year a	and geograph	hy listed	1	· · ·	· •			

In the West Texas region, DP 1321 B2RF was also compared to DP 0912 B2RF in 2009 to 2012. DP 1321 B2RF showed improvements over DP 0912 B2RF in lint percent (increase of 1.4 percent), fiber length (increase of 0.02 inches), strength (increase of 0.87 g/tex) and uniformity index (increase of 0.61 percent) (Table 8). The improved fiber quality of DP 1321 B2RF, with similar yield to an excellent yielding check variety gives growers additional options in the West Texas market for early to mid maturing varieties.

	Lint				Fiber	
	Yield		Fiber		Strength	Uniformity
Variety	(lb/acre)	Lint %	Length	Micronaire	(g/tex)	Index
DP 1321 B2RF	1264	38.9	1.13	4.8	30.5	83.11
DP 0912 B2RF	1274	37.5	1.10	4.9	29.6	82.50
Significance		**	**		**	**
Observations	61	61	23	23	23	23
% Wins	46	85	76	82	83	77
Significance levels der	noted by $+ =$	= 0.1; * = 0.0	05; ** = 0.01	l alpha error le	evels.	
Data Source: All Mon	santo (Breed	ling, Tech D	Development	, Commercial) and public	trials
available for the year a	and geograp	hy listed				

Table 8. Lint Yield, Lint %, Fiber Length, Micronaire, Fiber Strength, and Uniformity Index comparisons of DP 1321 B2RF and DP 0912 B2RF in West Texas, 2009–2012.

The improvements in DP 1321 B2RF over FM 9170B2F in testing conducted in West Texas were lint yield (increase of 70.5 lb/acre), lint percent (increase of 2.45 percent), micronaire (increase of 0.5), and uniformity index (increase of 0.47 percent). DP 1321 B2RF had reduced fiber strength when compared to FM 9170B2F (Table 9).

Table 9.	Lint	Yield,	Lint %,	Fiber	Length,	Micronaire,	Fiber	Strength,	and	Uniformity	Index	comparisons	of
DP 1321	B2RF	F and F	FM 9170E	32F in	West Te	xas, 2011–20)12.						

	Lint				Fiber				
	Yield		Fiber		Strength	Uniformity			
Variety	(lb/acre)	Lint %	Length	Micronaire	(g/tex)	Index			
DP 1321 B2RF	1053	35.7	1.10	4.6	30.7	82.00			
FM 9170B2F	983	33.2	1.15	4.1	31.7	81.53			
Significance	*	**	**	**	*	**			
Observations	35	35	13	13	13	13			
% Wins	60	91	8	8	23	83			
Significance levels denoted by $+ = 0.1$; $* = 0.05$; $** = 0.01$ alpha error levels.									
Data Source: All Monsanto (Breeding, Tech Development, Commercial) and public trials									
available for the year a	and geograph	hy listed							

<u>Summary</u>

DP 1311 B2RF is an early maturing variety ideal for the Midsouth region. In regional yield comparisons in the Midsouth and Southeast regions, DP 1311 B2RF was found to have similar yield performance and fit when compared to DP 0912 B2RF, but DP 1311 B2RF reported improved fiber quality potential. DP 1311 B2RF reported significantly lower micronaire rating when compared to DP 0912 B2RF, which could help in situations where high micronaire cotton is discounted. Also in testing DP 1311 B2RF averaged a significantly longer staple when compared to DP 0912 B2RF. In Monsanto (Breeding, Tech. Development, and Commercial) and public trial testing, DP 1311 B2RF was found to have greater lint yield (lbs/acre) performance to DP 0912 B2RF and ST 5458B2RF in Midsouth regional comparisons.

DP 1321 B2RF was found to have similar yield potential and improved fiber quality (fiber length and strength) than DP 0912 B2RF in the Northern Tier of the Midsouth and Southeast regions and in West Texas. In West Texas testing, DP1321 B2RF had improved lint yield potential and fiber quality characteristics when compared to competitor product FM 9170B2F. DP 1321 B2RF has an early to mid maturity fit best suited for short-season environments or for short-season management.

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