DELTAPINE® NEW CLASS OF '15 VARIETIES: DP 1555 B2RF AND DP 1558NR B2RF

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Abstract

DP 1555 B2RF and DP 1558NR B2RF are new cotton varieties that will be released for commercial sale in the 2015 growing season. DP 1555 B2RF and DP 1558NR B2RF are Genuity® Bollgard II® Roundup Ready® Flex cotton varieties.

The new cotton variety DP 1555 B2RF is a mid-full maturing cotton variety with high yield potential, especially in high-yield environments, and excellent fiber quality potential when compared to competitor products. DP 1555 B2RF has semi-smooth leaf pubescence with medium-tall plant height. Fiber quality ratings include fiber length of 1.15 inches, 4.4 micronaire, 31.7 g/tex fiber strength, and 82.4% uniformity. DP 1555 B2RF has very good storm resistance.

DP 1558NR B2RF is a full maturing cotton variety with resistance to root knot nematodes (RKN). DP 1558NR B2RF provides a yield advantage in fields with moderate to high root knot nematode populations when compared to RKN-susceptible varieties. DP 1558NR B2RF has semi-smooth leaf pubescence with a tall plant height and good storm resistance similar to DP 1454NR B2RF. Fiber quality ratings include fiber length of 1.14 inches, 4.9 micronaire, 32.3 g/tex fiber strength, and 83.5% uniformity.

Introduction

In 2015, Deltapine® brand is releasing for commercial introduction, a new mid-full maturing variety, DP 1555 B2RF, and a new full maturing variety, DP 1558NR B2RF, both with Genuity® Bollgard II® and Roundup Ready® Flex traits. The characteristics describing DP 1555 B2RF and DP 1558NR B2RF are summarized in Table 1. The highlights of DP 1555 B2RF are outstanding yield potential and fiber quality. DP 1558NR B2RF has an excellent combination of yield potential, fiber quality, and root knot nematode resistance for full-maturing markets.

Table 1. DP 1555 B2RF and DP 1558NR B2RF Characteristics and Fiber Quality.

Trait	DP 1555 B2RF	DP 1558NR B2RF
Maturity	Mid-Full	Full
Leaf Pubescence	Semi-Smooth	Semi-Smooth
Plant Height	Med-Tall	Tall
Seed Size	6,000+ seed/lb	5200 seed/lb
Micronaire	4.4	4.9
Length	1.15 inches	1.14 inches
Strength	31.7 g/tex	32.3 g/tex
Uniformity	82.4%	83.5%
Lint Percent	43.3%	41 - 43%
Storm Resistance	Very Good	Very Good
Root Knot Nematode	Not Resistant	Resistant
Fusarium Wilt	Moderate	Moderate
Verticillium Wilt	Moderate	Susceptible
Bacterial Blight	Susceptible	Susceptible
Rating and measurements from 2014 Monsanto Trials under permit		

Materials and Methods

The data describing DP 1555 B2RF and DP 1558NR 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 1555 B2RF Plant Mapping Comparisons

The growth and fruiting characteristics of DP 1555 B2RF, as measured by end-of-season plant mapping, are summarized in Table 2. The growth and fruiting variables of DP 1555 B2RF are similar to DP 1252B2RF and PHY 499 WRF in the Midsouth and Southeast region. DP 1555 B2RF requires 29 more heat units when compared to DP 1252 B2RF to achieve 100% open boll. DP 1555 B2RF is characterized as a mid-full maturing variety, with a slightly shorter plant height than DP 1252 B2RF and PHY 499 WRF.

Table 2. Plant mapping comparison of DP 1555 B2RF and DP 1252 B2RF in Monsanto Trials (2013) in the Midsouth and Southeast region.

	DP 1555 B2RF	DP 1252 B2RF	PHY 499 WRF
Plant Height (inches)	42.3	43.6	43.1
Total Nodes	21.4	21.3	21.2
Number of Fruiting Nodes	11.8	10.8	11.1
% Est Open	45.1%	45.6%	49.7%
Node of First Fruiting Branch	6.2	6.2	6.5
HU Difference to 100% open	+29	0	-15
Vigor	4.1	3.9	3.6
Fall Out Rating	1.6	1.6	1.9
String Out Rating	2.4	2.3	2.7
Data source: 2014 Monsanto PCM4 trials in the Midsouth and Southeast region under permit Fall Out and String Out Rating: 1=Tight, Storm-Proof boll; 9=Loose boll			

DP 1555 B2RF Yield, Fiber Quality, and Value Comparisons

DP 1555 B2RF was tested in sites in both lower Southeast and lower Midsouth regions (Tables 4 to 8) to compare yield potential and fiber quality characteristics. DP 1555 B2RF was compared to DP 1252 B2RF in testing conducted in the lower Southeast and lower Midsouth. DP 1555 B2RF showed improvements over DP 1252 B2RF in lint yield (increase of 39 lbs/acre), lint % (increase of 0.1%), and fiber strength (increase of 2.64 g/tex), and decrease in micronaire (decrease of 0.31) (Table 3).

Table 3. Lint Yield, Lint %, Fiber Length, Micronaire, Fiber Strength, and Uniformity Index comparisons of DP 1555 B2RF and DP 1252 B2RF in the Southeast and lower Midsouth regions, 2013-2014.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1555 B2RF	1482	43.67	1.17	4.42	32.36	82.82
DP 1252 B2RF	1443	43.57	1.14	4.73	29.72	83.12
Significance			**	**	**	
Observations	27	25	19	20	20	20
Years	2	2	2	2	2	2
% Wins	67	50	100	95	95	32
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 and geography listed under permit						

DP 1555 B2RF was compared to PHY 499 WRF in testing conducted in the lower Southeast and lower Midsouth. DP 1555 B2RF showed improvements over PHY 499 WRF in lint yield (increase of 125 lbs/acre), lint % (increase of 1.44%), and fiber length (increase of 0.03) (Table 4).

Table 4. Lint Yield, Lint %, Fiber Length, Micronaire, Fiber Strength, and Uniformity Index comparisons of DP 1555 B2RF and PHY 499 WRF in the Southeast and lower Midsouth regions, 2012-2014.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1555 B2RF	1574	44.02	1.18	4.44	32.27	83.18
PHY 499 WRF	1449	42.58	1.15	4.68	32.43	83.97
Significance	**	**	**	**		**
Observations	32	30	20	21	21	21
Years	3	3	3	3	3	3
% Wins	75	79	85	86	50	11
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 and geography listed under permit						

The improvement in DP 1555 B2RF over DP 1252 B2RF in testing conducted in the lower Southeast and lower Midsouth regions in locations with different yield ranges with a yield range of 1250 < 1750 lbs lint/acre (increase of 51 lbs lint/acre) and 1750 < 2250 (increase of 126 lbs lint/acre) (Table 5). In testing, DP 1555 B2RF won 67% of the trials with a yield range of 1250 < 1750 lbs lint/acre and 100% of the trials with a yield range of 1750< 2250 when compared to DP 1252 B2RF.

Table 5. Yield performance by yield environment comparisons of DP 1555 B2RF and DP 1252 B2RF in the lower Southeast and lower Midsouth regions.

Yield Range	# Tests	% Wins	DP 1555 B2RF	DP 1252 B2RF	Difference	p-Val	Significance
750.0 < 1250.0	9	56	1069	1078	-9	0.87009	
1250.0 < 1750.0	15	67	1604	1553	50	0.282888	
1750.0 < 2250.0	3	100	2109	1983	127	0.053989	+
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 and geography listed under permit							

The improvement in DP 1555 B2RF over PHY 499 WRF in testing conducted in the lower Southeast and lower Midsouth regions in locations with different yield ranges was in locations with a yield range of750 < 1250 (increase of 39 lbs lint/acre), 1250 < 1750 (increase of 117 lbs lint/acre), and 1750 < 2250 (increase of 307 lbs lint/acre) (Table 6). In testing, DP 1555 B2RF won trials with a yield range of 750 < 1250 (78% wins), 1250 < 1750 (67% wins) and 1750 < 2250 (100% of wins) when compared to PHY 499 WRF.

Table 6. Yield performance by yield environment comparisons of DP 1555 B2RF and PHY 499 WRF in the lower Southeast and lower Midsouth regions.

Yield Range	# Tests	% Wins	DP 1555 B2RF	PHY 499 WRF	Difference	p-Val	Significance
750.0 < 1250.0	9	78	1104	1065	39	0.58135	
1250.0 < 1750.0	18	67	1629	1512	117	0.017708	*
1750.0 < 2250.0	5	100	2221	1915	307	0.006857	**
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 and geography listed under permit							

DP 1555 B2RF was compared to PHY 499 WRF, 12R249B2R2, and 12R224B2R2 in testing conducted in the in the Upper Gulf Coast and Winter Garden region of Texas. DP 1555 B2RF showed improvements over the other products in lint yield, crop value, lint %, and fiber strength. (Table 7).

Table 7. Lint Yield, Crop Value, Loan Value, Lint %, Fiber Length, Micronaire, Fiber Strength, and Uniformity Index comparisons of DP 1555 B2RF, PHY 499 WRF, 12R249 B2RF, and DP 12R224 B2RF in the Upper Gulf Coast and Winter Garden region of Texas, 2013-2014.

Variety	Lint Yield (lb/acre)	Crop Value ($/acre)	Loan Value	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1555 B2RF	1576	866.34	0.5470	41.0	1.12	4.5	30.6	81.7
PHY 499 WRF	1550	830.57	0.5370	39.4	1.10	4.5	32.3	82.7
12R249B2R2	1464	808.43	0.5490	39.7	1.11	4.6	30.6	82.0
12R224B2R2	1521	790.86	0.5190	37.3	1.13	4.3	28.9	82.4
Data Source: 2 irrigated and 2 dryland trials under permit								

DP 1558 B2RF Plant Mapping Comparisons

The growth and fruiting characteristics of DP 1558NR B2RF, as measured by end-of-season plant mapping, are summarized in Table 8. The growth and fruiting variables of DP 1558NR B2RF are similar to DP 1454NR B2RF in Texas and Southeast trials. DP 1558NR B2RF requires 33 more heat units when compared to DP 1454NR B2RF to achieve 100% open boll. DP 1558NR B2RF is characterized as a full maturity variety, with a slightly shorter plant height than DP 1454NR B2RF.

Table 8. Plant mapping comparison of DP 1558NR B2RF and DP 1454NR B2RF in Monsanto Trials (2014) in the Texas and Southeast regions.

	DP 1558NR B2RF	DP 1454NR B2RF
Plant Height (inches)	33.9	35.0
Total Nodes	20.7	20.9
Number of Fruiting Nodes	11.7	11.8
% Est Open	37.2%	44.3%
Node of First Fruiting Branch	7.1	7.3
HU Difference to 100% open	+33	0
Data source: 2014 Monsanto PCM4 trials in the Texas and Southeast region under permit		

DP 1558NR B2RF Yield, Fiber Quality, and Value Comparisons

DP 1558NR B2RF was tested in sites in Texas, Southeast and Midsouth regions (Tables 9 to 15) to compare yield potential and fiber quality characteristics.

The yield comparison of DP 1558NR B2RF, as measured by root knot nematode and non-root knot nematode sites, is summarized in Table 9. DP 1558NR B2RF produced the highest lint yield when compared to competitor products in root knot nematode and non-root knot nematode sites.

Table 9. Yield comparison of DP 1558NR B2RF and competitor products in root knot nematode sites versus non-root knot nematode sites in Monsanto Trials (2013-2014) in Texas, Southeast and Midsouth regions.

Root Knot Nematode Trials			Non-Root Knot Nematode Trials	
Variety	Lint Yield (lbs lint/acre)		Variety	Lint Yield (lbs lint/acre)
DP 1558NR B2RF	**1795**		**DP 1558NR B2RF**	**1848**
14R1455B2R2	1744		14R1455B2RF	1822
DP 1454NR B2RF	1690		ST 4946GLB2	1773
ST 4946GLB2	1689		DP 1050 B2RF	1700
PHY 367 WRF	1517		DP 1454NR B2RF	1699
DP 1050 B2RF	1493		DP 1044 B2RF	1675
DP 1044 B2RF	1446		PHY 367 WRF	1604
N=18 (Texas, Southeast)			N=32 (Texas, Southeast, Midsouth)	

The 2014 yield comparison of DP 1558NR B2RF, as measured by root knot nematode and non-root knot nematode sites, is summarized in Table 10. DP 1558NR B2RF produced the highest lint yield when compared to competitor products in root knot nematode and non-root knot nematode sites.

Table 10. Yield comparison of DP 1558NR B2RF and competitor products in root knot nematode sites versus non-root knot nematode sites in Monsanto Trials (2014) in Texas, Southeast, and Midsouth regions.

Root Knot Nematode Trials			Non-Root Knot Nematode Trials	
Variety	Lint Yield (lbs lint/acre)		Variety	Lint Yield (lbs lint/acre)
DP 1558NR B2RF	**1875**		**DP 1558NR B2RF**	**1851**
DP 1454NR B2RF	1829		14R1455B2RF	1803
14R1455B2R2	1801		ST 4946GLB2	1753
ST 4946GLB2	1781		DP 1454NR B2RF	1732
PHY 417 WRF	1635		DP 1050 B2RF	1690
PHY 427 WRF	1563		PHY 417 WRF	1689
PHY 367 WRF	1558		PHY 427 WRF	1687
DP 1044 B2RF	1496		DP 1044 B2RF	1634
DP 1050 B2RF	1482		PHY 367 WRF	1563
N=9 (Texas, Southeast)			N=21 (Texas, Southeast, Midsouth)	

DP 1558NR B2RF was compared to DP 1454NR B2RF in non-RKN plot testing. DP 1558NR B2RF showed improvements over DP 1454NR B2RF in lint yield (increase of 112 lbs lint/acre), lint % (increase of 0.04%), fiber length (increase of 0.03 inches), and uniformity index (increase of 0.6) (Table 11).

Table 11. Lint Yield, Lint %, Fiber Length, Micronaire, Fiber Strength, and Uniformity Index comparisons of DP 1558NR B2RF and DP 1454NR B2RF, 2013-2014.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1558NR B2RF	1716	43.5	1.15	4.93	32.6	83.6
DP 1454NR B2RF	1604	43.1	1.12	4.81	30.1	83.0
Significance	**	**	**	**	**	**
Observations	61	67	28	28	28	28
Years	2	2	2	2	2	2
% Win	80	59	93	26	86	75
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 and geography listed under permit						

DP 1558NR B2RF was compared to ST 4946GLB2 in non-RKN plot testing. DP 1558NR B2RF showed improvements over ST 4946GLB2 in lint yield (increase of 90 lbs lint/acre), lint % (increase of 2.6%), fiber length (increase of 0.02 inches), and fiber strength (increase of 0.8 g/tex) (Table 12).

Table 12. Lint Yield, Lint %, Fiber Length, Micronaire, Fiber Strength, and Uniformity Index comparisons of DP 1558NR B2RF and ST 4946GLB2, 2013-2014.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1558NR B2RF	1754	43.7	1.16	4.94	32.6	83.8
ST 4946GLB2	1664	41.1	1.14	4.73	31.8	83.9
Significance	*	**	**	**	*	
Observations	56	62	26	26	26	26
Years	2	2	2	2	2	2
% Win	68	98	80	27	73	46
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 and geography listed under permit						

DP 1558NR B2RF was compared to DP 1044 B2RF in non-RKN plot testing. DP 1558NR B2RF showed improvements over DP 1044 B2RF in lint yield (increase of 228 lbs lint/acre), lint % (increase of 3.3%), fiber length (increase of 0.04 inches), fiber strength (increase of 3.4 g/tex), and uniformity index (increase of 0.7) (Table 13).

Table 13. Lint Yield, Lint %, Fiber Length, Micronaire, Fiber Strength, and Uniformity Index comparisons of DP 1558NR B2RF and DP 1044 B2RF, 2013-2014.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1558NR B2RF	1818	43.5	1.17	4.96	32.6	84.0
DP 1044 B2RF	1590	40.2	1.13	4.68	29.2	83.3
Significance	**	**	**	**	**	**
Observations	52	58	22	22	22	22
Years	2	2	2	2	2	2
% Win	85	98	77	18	100	71
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 and geography listed under permit						

DP 1558NR B2RF was compared to DP 1050 B2RF in non-RKN plot testing. DP 1558NR B2RF showed improvements over DP 1050 B2RF in lint yield (increase of 190 lbs lint/acre), fiber length (increase of 0.1 inches), and fiber strength (increase of 4.1 g/tex) (Table 14).

Table 14. Lint Yield, Lint %, Fiber Length, Micronaire, Fiber Strength, and Uniformity Index comparisons of DP 1558NR B2RF and DP 1050 B2RF, 2013-2014.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1558NR B2RF	1767	43.8	1.16	5.00	32.7	84.0
DP 1050 B2RF	1577	43.9	1.15	4.68	28.5	83.9
Significance	**		**	**	**	
Observations	56	59	24	24	24	24
Years	2	2	2	2	2	2
% Win	82	29	71	4	100	50
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 and geography listed under permit						

DP 1558NR B2RF and DP 1454NR B2RF were compared by region for % win based on lint yield.
DP 1558NR B2RF won 81%, 75%, and 100% of the trials when comparing lint yield to DP 1454NR B2RF in Texas, Southeast and Midsouth regions, respectively. (Table 15).

Table 15. Lint Yield Observations and % Wins of DP 1558NR B2RF and DP 1454NR B2RF in the Texas, Southeast and Midsouth regions, 2013-2014.

Region	Lint Yield # Obs.	Lint Yield Wins %	DP 1558 B2RF	DP 1454 B2RF	Lint Yield Difference	p-Val	Significance
Texas	16	81	1850	1700	150	0.01341	*
Southeast	24	75	1615	1516	99	0.000281	**
Midsouth	5	100	1824	1540	284	0.020062	*

Summary

DP 1555 B2RF is a mid-full maturing variety with high yield potential, ideal for production in the lower Southeast and lower Midsouth regions. DP 1555 B2RF was found to have improved yield potential in high-yield environments

and improved fiber length, micronaire and fiber strength when compared to DP 1252 B2RF. DP 1555 B2RF reported higher yield potential, fiber strength and micronaire rating when compared to the competitor product PHY 499 WRF.

DP 1558NR B2RF is a full maturing variety with root knot nematode resistance that is ideal for production in the Southeast and full-season Texas regions. In non-root knot nematode tests conducted in the Southeast, Midsouth, and Texas regions, DP 1558NR B2RF was found to have improved yield performance and fit when compared to DP 1454NRB2RF, DP 1044 B2RF, DP 1050 B2RF and competitor products ST 4946GLB2, PHY 417 WRF, PHY 427 WRF, and PHY 367 at both root knot nematode and non-root knot nematode sites.

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