MID TO FULL MATURING DELTAPINE® CLASS OF '16 BOLLGARD II® XTENDFLEX® COTTON VARIETIES

David W. Albers
Monsanto Company
Saint Louis, MO
Keylon Gholston
Monsanto Company
Baldwyn, MS

Abstract

DP 1639 B2XF and DP 1646 B2XF are Bollgard II® XtendFlex® cotton varieties designed to help maximize weed control through effective and sustainable weed management options, pending regulatory approval.

DP 1639 B2XF is a mid to mid-full maturing cotton variety with high yield potential that has excellent fiber length and strength. Fiber quality ratings include fiber length of 1.13 inches, 4.8 micronaire, 31.5 g/tex fiber strength, and 83.0% uniformity index. DP 1639 B2XF has semi-smooth leaf pubescence that is a best fit for mid-season environments in South Delta/East Texas regions.

DP 1646 B2XF is a mid-full maturing cotton variety with smooth leaf pubescence and is broadly adapted to full-season environments. Fiber quality ratings include fiber length of 1.19 to 1.22 inches, 4.5 micronaire, 29.0 to 30.0 g/tex fiber strength, and 82 to 83% uniformity index. This variety has similar storm tolerance to DP 1050 B2RF and best fit for full-season environments in the Southeast, Midsouth, and Texas regions.

Introduction

Deltapine® brand has mid to mid-full maturing cotton varieties, DP 1639 B2XF and DP 1646 B2XF, both with Bollgard II® XtendFlex® cotton technology. The characteristics describing DP 1639 B2XF and DP 1646 B2XF are summarized in Table 1. The highlights of DP 1639 B2XF are excellent fiber length and strength. DP 1646 B2XF also has an excellent combination of yield potential and fiber quality with increased fiber length ideal for full-season environments.

Table 1. DP 1639 B2XF and DP 1646 B2XF Characteristics and Fiber Quality.

Characteristic	DP 1639 B2XF	DP 1646 B2XF
Maturity	Mid to Mid-Full	Mid-Full
Leaf Pubescence	Semi-Smooth	Smooth
Micronaire	4.8	4.5
Length	1.13 inches	1.19 to 1.22 inches
Strength	31.5 g/tex	29.0 to 30.0 g/tex
Uniformity	83.0%	83.0%
Growth/PGR Management	Aggressive	
Bacterial Blight	Susceptible	Susceptible
Rating and measurements from 2015 Monsanto Trials.		

Materials and Methods

The data describing DP 1639 B2XF and DP 1646 B2XF (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 1639 B2XF and DP 1646 B2XF Plant Mapping Comparisons

The growth and fruiting characteristics of DP 1639 B2XF, as measured by end-of-season plant mapping, are summarized in Table 2. The growth and fruiting variables of DP 1639 B2XF are similar to DP 1538 B2XF in mid-full set data trials. DP 1639 B2XF requires 16 less heat units to achieve 100% open boll when compared to the similar mid-full maturing cotton product DP 1538 B2XF. DP 1639 B2XF is characterized as a mid to mid-full maturing variety, with a higher vigor rating, similar total nodes, and a slightly shorter plant height than DP 1538 B2XF.

Table 2. Plant mapping comparison of DP 1639 B2XF and DP 1538 B2XF in Monsanto Trials (2015) in in-season mid-full set data trials.

	DP 1639 B2XF	DP 1538 B2XF
Vigor Rating	3.9	3.5
Plant Height (inches)	40.9	45.8
Total Nodes	20.8	20.7
Number of Fruiting Nodes	12.6	13.5
% Est Open	57.1	59.0
Node of First Fruiting Branch	5.7	5.8
HU Difference to 100% open	-16	0
Fall Out Rating	1.5	1.4
String Out Rating	2.3	2.7

The growth and fruiting characteristics of DP 1646 B2XF, as measured by end-of-season plant mapping, are summarized in Table 3. The growth and fruiting variables of DP 1646 B2XF is similar to DP 1553 B2XF in mid-full set data trials. DP 1646 B2XF requires 14 less heat units to achieve 100% open boll when compared to the similar maturing cotton product. DP 1646 B2XF is characterized as a mid-full maturing variety, with similar height and vigor rating to DP 1553 B2XF.

Table 3. Plant mapping comparison of DP 1646 B2XF and DP 1553 B2XF in Monsanto Trials (2015) in in-season mid-full set data trials.

	DP 1646 B2XF	DP 1553 B2XF
Vigor Rating	3.3	3.2
Plant Height (inches)	43.8	43.7
Total Nodes	21.7	20.2
Number of Fruiting Nodes	12.7	11.7
% Est Open	60.6	53.2
Node of First Fruiting Branch	6.2	6.0
HU Difference to 100% open	-14	0
Fall Out Rating	1.2	1.5
String Out Rating	2.0	2.2

DP 1639 B2XF Yield, Fiber Quality, and Value Comparisons

DP 1639 B2XF was compared to DP 1538 B2XF in testing conducted across the Upper Southeast region in 2014 and 2015. DP 1639 B2XF showed improvements over DP 1538 B2XF in lint yield (increase of 7 lbs lint/acre), fiber length (increase of 0.03 inches), strength (increase of 2.16 g/tex), and uniformity index (increase of 0.92) (Table 4).

Table 4. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 1639 B2XF and DP 1538 B2XF across the Upper Southeast region, 2014 and 2015.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1639 B2XF	1,165	41.91	1.12	4.62	29.10	82.89
DP 1538 B2XF	1,158	42.47	1.09	4.60	26.94	81.97
Significance			**		**	**
Observations	20	20	17	17	17	17
Years	2	2	2	2	2	2
% Wins	50	32	100	41	100	88
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: All Monsanto (Breeding, Tech Development) and University trials available for 2014 and 2015 in the Upper Southeast region.						

DP 1639 B2XF was compared to PHY 333 WRF in testing conducted in the Upper Southeast region. DP 1639 B2XF showed improvements over PHY 333 WRF in lint yield (increase of 25 lbs lint/acre) and strength (increase of 0.43 g/tex) (Table 5).

Table 5. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 1639 B2XF and PHY 333 WRF in the Upper Southeast region, 2015.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1639 B2XF	1,077	41.36	1.12	4.96	27.79	82.76
PHY 333 WRF	1,052	41.32	1.14	4.66	27.36	83.00
Significance				**	+	
Observations	15	15	10	10	10	10
Years	1	1	1	1	1	1
% Wins	53	53	20	20	70	50
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: All Monsanto (Breeding, Tech Development) and University trials available for 2015 in the Upper Southeast region.						

DP 1646 B2XF was compared to ST 4946GLB2 in testing conducted across the Beltwide region. DP 1646 B2XF showed improvements over ST 4946GLB2 in lint yield (increase of 53 lbs lint/acre), lint % (increase of 3.05%), and fiber length (increase of 0.07 inches) (Table 6).

Table 6. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 1646 B2XF and ST 4946GLB2 across the Beltwide region.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1646 B2XF	1,253	40.58	1.20	4.45	29.25	82.61
ST 4946GLB2	1,200	37.53	1.13	4.55	31.03	83.01
Significance	**	**	**	*	**	**
Observations	136	143	108	108	108	108
Years	1	1	1	1	1	1
% Wins	61	98	96	61	10	36
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: All Monsanto (Breeding, Tech Development) and University trials available for 2015 in the Beltwide region.						

DP 1646 B2XF was compared to PHY 499 WRF in testing conducted across the Beltwide region. DP 1646 B2XF showed improvements over PHY 499 WRF in lint yield (increase of 90 lbs lint/acre), lint % (increase of 1.25%), and fiber length (increase of 0.08 inches) (Table 7).

Table 7. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 1646 B2XF and PHY 499 WRF across the Beltwide region.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1646 B2XF	1,247	40.27	1.20	4.46	29.30	82.52
PHY 499 WRF	1,157	39.02	1.12	4.58	31.13	83.11
Significance	**	**	**	**	**	**
Observations	121	121	94	94	94	94
Years	1	1	1	1	1	1
% Wins	69	79	99	68	13	29
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: All Monsanto (Breeding, Tech Development) and University trials available for 2015 in the Beltwide region.						

DP 1646 B2XF was compared to DP 1538 B2XF in testing conducted across the Beltwide region. DP 1646 B2XF showed improvements over DP 1538 B2XF in lint yield (increase of 107 lbs lint/acre), lint % (increase of 0.07%), fiber length (increase of 0.10 inches), strength (increase of 1.72 g/tex), and uniformity index (increase of 0.16) (Table 8).

Table 8. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 1646 B2XF and DP 1538 B2XF across the Beltwide region.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1646 B2XF	1,342	41.01	1.22	4.44	29.98	83.11
DP 1538 B2XF	1,236	40.94	1.12	4.69	28.26	82.95
Significance	**		**	**	**	
Observations	49	50	33	33	33	33
Years	1	1	1	1	1	1
% Wins	73	66	97	85	84	70
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: All Monsanto (Breeding, Tech Development) and University trials available for 2015 in the Beltwide region.						

DP 1646 B2XF was compared to DP 1553 B2XF in testing conducted across the Beltwide region. DP 1646 B2XF showed improvements over DP 1553 B2XF in lint yield (increase of 143 lbs lint/acre), lint % (increase of 0.86%), fiber length (increase of 0.04 inches), and strength (increase of 0.55 g/tex) (Table 9).

Table 9. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 1646 B2XF and DP 1553 B2XF across the Beltwide region.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1646 B2XF	1,350	40.62	1.21	4.45	29.92	82.76
DP 1553 B2XF	1,207	39.76	1.17	4.41	29.37	82.82
Significance	**	**	**		**	
Observations	72	70	54	54	54	54
Years	1	1	1	1	1	1
% Wins	76	83	93	42	66	56
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: All Monsanto (Breeding, Tech Development) and University trials available for 2015 in the Beltwide region.						

DP 1646 B2XF was compared to PHY 499 WRF in testing conducted across the South Texas region. DP 1646 B2XF showed improvements over PHY 499 WRF in lint yield (increase of 66 lbs lint/acre), lint % (increase of 0.95%), and fiber length (increase of 0.07 inches) (Table 10).

Table 10. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 1646 B2XF and PHY 499 WRF across the South Texas region, 2015.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1646 B2XF	1,167	38.59	1.17	4.44	28.81	81.74
PHY 499 WRF	1,101	37.64	1.09	4.56	30.60	82.69
Significance	+	*	**	**	**	**
Observations	30	31	31	31	31	31
Years	1	1	1	1	1	1
% Wins	63	70	100	69	10	19
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: All Monsanto (Breeding, Tech Development) and University trials available for 2015 in the South Texas region.						

DP 1646 B2XF was compared to FM 2334GLT in testing conducted across the West Texas region. DP 1646 B2XF showed improvements over FM 2334GLT in lint yield (increase of 32 lbs lint/acre), lint % (increase of 2.61%), and fiber length (increase of 0.01 inches) (Table 11).

Table 11. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 1646 B2XF and FM 2334GLT across the West Texas region, 2015.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1646 B2XF	1,021	38.61	1.19	4.17	29.40	81.88
FM 2334GLT	989	35.99	1.18	4.23	30.45	82.48
Significance		**			*	+
Observations	28	28	21	21	21	21
Years	1	1	1	1	1	1
% Wins	64	79	62	52	29	24
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: All Monsanto (Breeding, Tech Development) and University trials available for 2015 in the West Texas region.						

DP 1646 B2XF was compared to PHY 499 WRF in testing conducted across the Lower Southeast and Lower Midsouth regions. DP 1646 B2XF showed improvements over PHY 499 WRF in lint yield (increase of 100 lbs lint/acre), lint % (increase of 1.00%), and fiber length (increase of 0.09 inches) (Table 12).

Table 12. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 1646 B2XF and PHY 499 WRF across the Lower Southeast and Lower Midsouth regions, 2015.

Variety	Lint Yield (lb/acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 1646 B2XF	1,419	42	1.22	4.58	29.82	83.46
PHY 499 WRF	1,319	41	1.13	4.89	31.98	83.57
Significance	**	**	**	**	**	
Observations	50	49	31	31	31	31
Years	1	1	1	1	1	1
% Wins	70	82	100	90	16	41
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: All Monsanto (Breeding, Tech Development) and University trials available for 2015 in the Lower Southeast and Lower Midsouth regions.						

Summary

DP 1639 B2XF and DP 1646 B2XF are two cotton varieties with Bollgard II® XtendFlex® cotton technology.

DP 1639 B2XF is a mid to mid-full maturing variety with high yield potential in full-season environments, especially best fit for the Upper Southeast, Lower Midsouth, and East Texas regions. DP 1639 B2XF was found to have improved fiber length compared to DP 1538 B2XF with excellent fiber properties.

DP 1614 B2XF is a mid-full maturing variety that is broadly adapted to full-season environments and is best fit for the Southeast, Midsouth, and Texas regions. DP 1646 B2XF has outstanding fiber properties with fiber lengths up to 1.25 to 1.28 inches (40-41 staple). DP 1646 B2XF was found to have higher yield potential when compared to competitor products PHY 333 WRF, ST 4946GLB2, FM 2334GLT, and PHY 499 WRF.

DO NOT APPLY DICAMBA HERBICIDE IN-CROP TO Bollgard II XtendFlex Cotton in 2016 unless a dicamba herbicide product is approved that is specifically labeled for that use in the location where you intend to make the application. Contact the U.S. EPA and your state pesticide regulatory agency with any questions about the approval status of dicamba herbicide products for in-crop use with Bollgard II XtendFlex Cotton.
IT IS A VIOLATION OF FEDERAL AND STATE LAW TO MAKE AN IN-CROP APPLICATION OF ANY DICAMBA HERBICIDE PRODUCT ON BOLLGARD II XTENDFLEX COTTON UNLESS THE PRODUCT LABELING SPECIFICALLY AUTHORIZES THAT USE.

Legals as of January 1, 2016