DELTAPINE® CLASS OF '22 COTTON VARIETIES

David W. Albers
Bayer Crop Science
Saint Louis, MO
Eric Best
Bayer Crop Science
Lubbock, TX
Keylon Gholston
Bayer Crop Science
Baldwyn, MS

Abstract

Two new cotton varieties will be released for the Deltapine® Class of '22, DP 2239 B3XF with Bollgard® 3 XtendFlex® Technology and DP 2211 B3TXF with Bollgard 3 ThryvOn™ Cotton with XtendFlex® Technology. These cotton varieties are described for plant characteristics, disease tolerance, fiber quality, yield potential, management recommendations, and regional fit.

Introduction

For the 2022 growing season, Deltapine® brand is introducing two new cotton varieties, an early maturing variety (DP 2211 B3TXF) and a mid-maturing variety (DP 2239 B3XF). The early maturing cotton variety may be ideal for the Midsouth, Carolinas and Southeast regions while the mid-full maturing cotton variety maybe considered across the cotton belt region. These cotton varieties all offer high yield potential and excellent fiber quality. DP 2211 B3TXF will be the first cotton variety commercially available with ThryvOn™ Technology the industry's first biotech trait providing protection against tarnished plant bugs and thrips species.*

Materials and Methods

The data describing Deltapine brand cotton varieties (along with internal and competitive check varieties) was obtained from the following sources: Bayer breeder trials, Bayer on-farm trials, and university trials. Plant growth, fruiting, and maturity comparisons were made by plant mapping a subset of the Bayer on-farm trials when approximately 50% of the bolls were open. All available yield, fiber quality, and plant mapping data were queried in December 2018 to develop each data table for these analyses. The rating for plant mapping data (vigor score, fall out, and string out rating): 1 = Excellent; 9 = Poor.

Results and Discussion

DP 2239 B3XF

DP 2239 B3XF is a mid-maturing cotton variety with Bollgard® 3 XtendFlex® Technology that offers high yield potential. This variety may be considered as an option across the cotton belt, with strong performance in the upper Midsouth and upper Southeast regions. DP 2239 B3XF has smooth leaf pubescence, medium plant height, and in trials has shown responsive to plant growth regulator applications.

DP 2239 B3XF vs. DP 1646 B2XF Plant Mapping Comparisons

The growth and fruiting characteristics of DP 2239 B3XF compared to DP 1646 B2XF, as measured by end-of-season plant mapping, are summarized in Table 1. The growth and fruiting variables of DP 2239 B3XF are similar to DP 1646 B2XF in Bayer trials. DP 2239 B3XF has a shorter plant height when compared to DP 1646 B2XF. DP 2239 B3XF has increased number of nodes of the first fruiting branch, a tighter string out and fall out rating, and improved storm resistance when compared to DP 1646 B2XF. DP 2239 B3XF matures slightly earlier when compared to DP 1646 B2XF.

Table 1. Plant mapping comparison of DP 2239 B3XF vs. DP 1646 B2XF in Bayer Trials (2020-2021).

	Deviation	DP 2239 B3XF	DP 1646 B2XF
Vigor Score (rating 1 to 9)	-0.44	2.6	3.1
Plant Height (inches)	-4.5	31.9	36.4
Total Nodes	-1.7	18.6	20.3
% Est Open	-0.3	67.7	68.1
Node of First Fruiting Branch	0.2	7.1	6.8
Node Uppermost Cracked Boll	-0.1	11.2	11.3
Node Uppermost Harvestable Boll	0.0	15.5	15.5
DD60 to 100% open	3	215	212
Fall Out Rating	-0.5	1.5	2.0
String Out Rating	-0.7	2.3	3.0
TX Storm Res.	-0.61	5.3	5.9
Rating: 1=Excellent 9=Poor			

The growth and fruiting characteristics of DP 2239 B3X compared to DP 2038 B3XF, as measured by end-of-season plant mapping, are summarized in Table 2. The growth and fruiting variables of DP 2239 B3XF are similar to DP 2038 B3XF in Bayer trials. DP 2239 B3XF has a shorter plant height when compared to DP 2038 B3XF. DP 2239 B3XF has increased number of nodes of the first fruiting branch, a tighter string out and fall out rating and improved storm tolerance when compared to DP 2038 B3XF. DP 2239 B3XF matures earlier when compared to DP 2038 B3XF.

Table 2. Plant mapping comparison of DP 2239 B3XF vs. DP 2038 B3XF in Bayer Trials (2020-2021).

	Deviation	DP 2239 B3XF	DP 2038 B3XF
Vigor Score (rating 1 to 9)	-0.42	2.8	3.2
Plant Height (inches)	-4.6	30.3	34.9
Total Nodes	0.0	18.3	18.3
% Est Open	-5.7	60.1	65.8
Node of First Fruiting Branch	0.5	7.2	6.7
Node Uppermost Cracked Boll	-0.4	9.6	10.0
Node Uppermost Harvestable Boll	0.4	15.2	14.8
DD60 to 100% open	39	280	241
Fall Out Rating	-1.1	1.9	3.0
String Out Rating	-1.2	2.8	4.0
TX Storm Res.	-0.75	5.8	6.5
Rating 1=Excellent 9=Poor			

DP 2239 B3XF Yield and Fiber Quality

DP 2239 B3XF was compared to DP 1646 B2XF in testing conducted in the Midsouth, Carolinas, Southeast, and South Texas regions. DP 2239 B3XF showed improvements over DP 1646 B2XF in yield (increase of 61 lbs./acre), lint % (increase of 0.8%), micronaire (increase of 0.15), fiber strength (increase of 0.4 g/tex), and uniformity index (increase of 0.1). DP 2239 B3XF had similar fiber length when compared to DP 1646 B2XF (Table 3).

Table 3. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 2239 B3XF and DP 1646 B2XF in the Midsouth, Carolinas, and Southeast regions, 2020-2021.

Variety	Lint Yield (lb./acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 2239 B3XF	1,334	42.8	1.22	4.52	30.0	83.5
DP 1646 B2XF	1,273	41.9	1.24	4.38	29.5	83.4
Observations	101	106	85	85	85	85
Years	2	2	2	2	2	2
% Wins	61.8	79.4	23.2	26.0	70.3	58.6
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: Midsouth, Carolinas, Southeast, and South Texas regions 2020-2021 – all data sources: TechDev and Breeding PCM4, NPE, and University.						

DP 2239 B3XF was compared to DP 2038 B3XF in testing conducted in the Midsouth, Carolinas, and Southeast regions. DP 2239 B3XF showed improvements over DP 2038 B3XF in yield (increase of 10 lbs./acre), fiber length (increase of 0.1 inches), fiber strength (increase of 0.4 g/tex), and uniformity index (increase of 1.5). DP 2239 B3XF had similar micronaire when compared to DP 2038 B3XF (Table 4).

Table 4. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 2239 B3XF and DP 2038 B3XF in the Midsouth, Carolinas and Southeast regions, 2020-2021.

Variety	Lint Yield (lb./acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 2239 B3XF	1,389	42.7	1.24	4.39	29.7	83.7
DP 2038 B3XF	1,379	44.8	1.14	4.43	29.3	82.2
Observations	77	82	64	64	64	64
Years	2	2	2	2	2	2
% Wins	55.9	5.9	100.0	62.3	64.6	96.5
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: Midsouth, Carolinas, Southeast regions 2020-2021 – all data sources: TechDev and Breeding PCM4, NPE, and University.						

DP 2239 B3XF was compared to DP 2012 B3XF in testing conducted in the Midsouth, Carolinas, and Southeast regions. DP 2239 B3XF showed improvements over DP 2012 B3XF in yield (increase of 9 lbs./acre), lint % (increase of 1.9%), fiber length (increase of 0.03 inches), and uniformity index (increase of 0.1). DP 2239 B3XF had similar fiber strength when compared to DP 2012 B3XF (Table 5).

Table 5. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 2239 B3XF and DP 2012 B3XF in the Midsouth, Carolinas and Southeast regions, 2020-2021.

Variety	Lint Yield (lb./acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 2239 B3XF	1,467	42.6	1.24	4.41	29.7	83.8
DP 2012 B3XF	1,458	40.7	1.21	4.38	29.8	83.7
Observations	55	61	46	46	46	46
Years	2	2	2	2	2	2
% Wins	53.8	1.2	75.8	56.5	46.9	54.6
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: Midsouth, Carolinas, Southeast regions 2020-2021 – all data sources: TechDev and Breeding PCM4, NPE, and University.						

DP 2239 B3XF was compared to DP 2012 B3XF in testing conducted in the Midsouth, Carolinas, Southeast, and South Texas regions. DP 2239 B3XF showed improvements over DP 2012 B3XF of lint % (increase of 2.0%), fiber length (increase of 0.03 inches), and uniformity index (increase of 0.1). DP 2239 B3XF had slightly reduced lint yield and fiber strength when compared to DP 2012 B3XF (Table 6).

Table 6. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 2239 B3XF and DP 2012 B3XF in Midsouth, Carolinas, Southeast, and South Texas regions, 2020-2021.

Variety	Lint Yield (lb./acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 2239 B3XF	1,378	42.6	1.23	4.57	30.1	83.6
DP 2012 B3XF	1,385	40.6	1.20	4.48	30.2	83.5
Observations	71	78	60	60	60	60
Years	2	2	2	2	2	2
% Wins	52.5	2.7	72.0	42.4	43.2	57.8
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: Midsouth, Carolinas, Southeast, and South Texas region 2020-2021 – all data sources: TechDev and Breeding PCM4, NPE, and University.						

DP 2239 B3XF was compared to DP 1845 B3XF in testing conducted in the Southern High Plains and Southern Rolling Plains regions. DP 2239 B3XF showed improvements over DP 1845 B3XF in lint yield (increase of 69 lbs./acre), lint % (increase of 1.9%), and micronaire (increase of 0.27). DP 2239 B3XF had the same fiber length and uniformity index when compared to DP 1845 B3XF (Table 7).

Table. 7 Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 2239 B3XF and DP 1845 B3XF in Southern High Plains and Southern Rolling Plains regions, 2020-2021.

Variety	Lint Yield (lb./acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 2239 B3XF	1,667	42.4	1.2	4.23	28.5	82.4
DP 1845 B3XF	1,598	40.5	1.2	3.96	30.4	82.4
Observations	18	20	10	11	10	11
Years	2	2	2	2	2	2
% Wins	70.1	4.2	47.6	0.0	7.1	58.3
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: Southern High Plains and Southern Rolling Plains regions 2020-2021 – all data sources: TechDev and Breeding PCM4, NPE, and University.						

DP 2239 B3XF was compared to DP 1646 B2XF in testing conducted in the Southern High Plains and Southern Rolling Plains regions. DP 2239 B3XF showed improvements over DP 1646 B2XF in lint yield (increase of 29 lbs./acre), lint % (increase of 0.6%), micronaire (increase of 0.04), and uniformity index (increase of 0.6). DP 2239 B3XF has the same fiber length and similar strength when compared to DP 1646 B2XF (Table 8).

Table 8. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 2239 B3XF and DP 1646 B2XF in the Southern High Plains and Southern Rolling Plains regions, 2020-2021.

Variety	Lint Yield (lb./acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 2239 B3XF	1,549	42.3	1.17	4.33	28.1	82.4
DP 1646 B2XF	1,520	41.7	1.17	4.29	28.2	81.8
Observations	21	23	14	14	14	14
Years	2	2	2	2	2	2
% Wins	67.3	40.1	67.5	22.5	60.0	77.5
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: Southern High Plains and Southern Rolling Plains regions 2020-2021 – all data sources: TechDev and Breeding PCM4, NPE, and University.						

DP 2211 B3TXF

DP 2211 B3TXF is an early maturing cotton variety with a medium tall plant stature and solid performance across the Midsouth, Carolina, and Southeast regions. DP 2211 B3TXF has smooth leaf pubescence. This new variety has Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology to help provide season-long protection against tarnished plant bugs and thrips species* and may help reduce the need for some insecticide applications.

DP 2211 B3TXF vs. DP 1646 B2XF Plant Mapping Comparisons

The growth and fruiting characteristics of DP 2211 B3TXF, as measured by end-of-season plant mapping, are summarized in Table 9. The growth and fruiting variables of DP 2211 B3TXF are similar to DP 1646 B2XF from in season data trials. DP 2211 B3TXF has a slightly taller plant stature and matures earlier when compared to DP 1646 B2XF. DP 2211 B3TXF has an earlier maturity and similar node of first fruiting branch and fall out rating when compared to DP 1646 B2XF.

Table 9. Plant mapping comparison of DP 2211 B3TXF vs. DP 1646 B2XF in Bayer Trials (2020-2021) in season data.

	Deviation	DP 2211 B3TXF	DP 1646 B2XF
Vigor Score (rating 1 to 9)	-0.492	1.4	1.9
Plant Height (inches)	0.2	37.9	37.6
Total Nodes	-1.7	14.6	16.3
% Est Open	13.2	81.8	68.6
Node of First Fruiting Branch	-0.3	6.9	7.1
DD60 to 100% open	-64	188	252
Fall Out Rating	0.6	2.2	1.6
String Out Rating	1.5	4.1	2.6
TX Storm Res.	1.14	6.7	5.5
Rating 1=Excellent 9=Poor			

DP 2211 B3TXF Yield and Fiber Quality

DP 2211 B3TXF was compared to DP 2012 B3XF in testing conducted in the Midsouth, Carolinas, and Southeast regions. DP 2211 B3TXF showed improvements over DP 2012 B3XF in yield (increase of 106 lbs./acre) and lint % (increase 2.7%). DP 2211 B3TXF had reduced fiber length, micronaire, strength, and uniformity index when compared to DP 2012 B3XF (Table 10).

Table 10. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 2211 B3TXF and DP 2012 B3XF in the Midsouth, Carolinas, and Southeast regions, 2019-2021.

Variety	Lint Yield (lb./acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 2211 B3TXF	1,696	43.5	1.14	4.13	28.1	82.7
DP 2012 B3XF	1,590	40.8	1.20	4.17	30.9	83.9
Observations	25	27	16	16	16	16
Years	3	3	3	3	3	3
% Wins	80.0	2.4	10.0	63.3	3.3	20.0
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: Midsouth, Carolinas, and Southeast regions, 2019-2021 – all data sources: TechDev and Breeding PCM4, NPE, and University.						

DP 2211 B3TXF was compared to DP 2020 B3XF in testing conducted in the Midsouth, Carolinas, and Southeast regions. DP 2211 B3TXF showed improvements over DP 2020 B3XF in yield (increase of 161 lbs./acre), lint percent (increase of 3.4%), and micronaire (increase of 0.05). DP 2211 B3TXF has similar fiber length, fiber strength, and uniformity index when compared to DP 2020 B3XF (Table 11).

Table 11. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 2211 B3TXF and DP 2020 B3XF in the Midsouth, Carolinas, and Southeast regions, 2019-2021.

Variety	Lint Yield (lb./acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 2211 B3TXF	1,632	43.4	1.17	4.04	28.3	82.9
DP 2020 B3XF	1,471	40.0	1.22	3.99	29.8	83.3
Observations	29	31	21	21	21	21
Years	3	3	3	3	3	3
% Wins	82.6	0.0	2.6	43.4	5.3	43.4
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: Midsouth, Carolinas, and Southeast regions, 2019-2021 – all data sources: TechDev and Breeding PCM4, NPE, and University.						

DP 2211 B3TXF was compared to DP 2127 B3XF in testing conducted in the Midsouth, Carolinas, and Southeast regions. DP 2211 B3TXF showed improvements over DP 2127 B3XF in yield (increase of 25 lbs./acre), lint % (increase 0.1%), fiber length (increase of 0.03 inches), and had reduced micronaire (decrease of -0.36) (Table 12).

Table 12. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 2211 B3TXF and DP 2127 B3XF in the Midsouth, Carolinas, and Southeast regions, 2019-2021.

Variety	Lint Yield (lb./acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 2211 B3TXF	1,678	43.8	1.19	4.66	29.6	84.1
DP 2127 B3XF	1,635	43.7	1.16	5.02	30.6	84.2
Observations	15	17	10	10	10	10
Years	3	3	3	3	3	3
% Wins	47.7	65.0	100.0	100.0	20.0	40.0
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: Midsouth, Carolinas, and Southeast regions, 2019-2021 – all data sources: TechDev and Breeding PCM4, NPE, and University.						

DP 2211 B3TXF was compared to DP 2131 B3TXF in testing conducted in the Midsouth, Carolinas, and Southeast regions. DP 2211 B3TXF showed improvements over DP 2131 B3TXF in yield (increase of 44 lbs./acre), lint % (increase of 0.3%), and uniformity index (increase of 0.3). DP 2211 B3TXF had similar fiber length, micronaire and fiber strength when compared to DP 2131 B3TXF (Table 13).

Table 13. Lint yield, lint %, fiber length, micronaire, fiber strength, and uniformity index comparisons of DP 2211 B3TXF and DP 2131 B3TXF in the Midsouth, Carolinas, and Southeast regions, 2019-2021.

Variety	Lint Yield (lb./acre)	Lint %	Fiber Length	Micronaire	Fiber Strength (g/tex)	Uniformity Index
DP 2211 B3TXF	1,657	43.4	1.14	4.15	28.1	82.8
DP 2131 B3TXF	1,613	43.1	1.21	4.24	28.7	82.5
Observations	29	32	22	22	22	22
Years	3	3	3	3	3	3
% Wins	61.3	29.5	7.1	78.6	23.8	73.8
Significance levels denoted by + = 0.1; * = 0.05; ** = 0.01 alpha error levels. Data Source: Midsouth, Carolinas, and Southeast regions 2019-2021 – all data sources: TechDev and Breeding PCM4, NPE, and University.						

Summary

DP 2239 B3XF is a mid-maturing cotton variety with high yield potential. The variety has medium plant stature that offers a broad fit for mid-maturity markets across the cotton belt, with strong performance especially in the upper Midsouth and upper Southeast region. It has excellent yield potential and is responsive to plant growth regulator applications allowing for growth management. This variety offers improved standability, fiber length and micronaire when compared to other top check Deltapine® cotton varieties. This variety has smooth leaf pubescence with moderate susceptibility to verticillium.

DP 2211 B3TXF is an early maturing cotton variety with a medium tall plant stature and solid performance in the Midsouth, Carolinas, and Southeast region. This variety offers trait protection from thrips and lygus with ThryvOn Technology. DP 2211 B3TXF offers strong yield potential performance versus top checks in the Deltapine Class of ’20 and ’21 for short season environments. The new variety provides similar yield performance when compared to mid- to full-season varieties. DP 2211 B3TXF may be considered an early companion variety with DP 2131 B3TXF.

**ThryvOn™ Technology may help reduce insecticide applications for tarnished plant bugs and thrips species (tobacco thrips (Frankliniella fusca); Western flower thrips (Frankliniella occidentalis); tarnished plant bug (Lygus lineolaris); and the Western Tarnished Plant bug (Lygus Hesperus)). Scouting is critical to determine which and how many insecticide applications are recommended to avoid economic losses greater than the pest management costs (i.e., when economic thresholds are met).*

Bayer is a member of Excellence Through Stewardship® (ETS). Bayer products are commercialized in accordance with ETS Product Launch Stewardship Guidance, and in compliance with Bayer's Policy for Commercialization of Biotechnology-Derived Plant Products in Commodity Crops. Commercialized products have been approved for import into key export markets with functioning regulatory systems. Any crop or material produced from this product can only be exported to, or used, processed or sold in countries where all necessary regulatory approvals have been granted. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted. Growers should talk to their grain handler or product purchaser to confirm their buying position for this product. Excellence Through Stewardship® is a registered trademark of Excellence Through Stewardship.

ThryvOn™ Technology has received full approval for planting in the United States but, as of the date this material was published, is pending approval in certain export markets. Specific plans for commercialization depend upon regulatory approvals and other factors.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. It is a violation of federal and state law to use any pesticide product other than in accordance with its labeling. NOT ALL formulations of dicamba, glyphosate or glufosinate are approved for in-crop use with products with XtendFlex® Technology. ONLY USE FORMULATIONS THAT ARE SPECIFICALLY LABELED FOR SUCH USES AND APPROVED FOR SUCH USE IN THE STATE OF 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 Roundup Ready 2 Xtend® soybeans or products with XtendFlex® Technology.

B.t. products may not yet be registered in all states. Check with your seed brand representative for the registration status in your state.

Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

Products with XtendFlex® Technology contains genes that confer tolerance to glyphosate, glufosinate and dicamba. Glyphosate will kill crops that are not tolerant to glyphosate. Dicamba will kill crops that are not tolerant to dicamba. Glufosinate will kill crops that are not tolerant to glufosinate. Contact your seed brand dealer or refer to the Bayer Technology Use Guide for recommended weed control programs.

Insect control technology provided by Vip3A is utilized under license from Syngenta Crop Protection AG. LibertyLink® and the Water Droplet Design® is a trademark of BASF Corporation. Bayer, Bayer Cross, Bollgard II®, Bollgard®, Deltapine®, Respect the Refuge and Cotton Design®, Roundup Ready 2 Xtend®, Roundup Ready®, ThryvOn™ and XtendFlex® are trademarks of Bayer Group. All other trademarks are the property of their respective owners. ©2021 Bayer Group. All rights reserved.