

2013 Evaluation of Non-Irrigated Mid- to Full-Season Maturing Cotton Varieties in Jay, Florida¹

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This report includes a summary of the 2013 mid- to full-season cotton Official Variety Trial in Jay, Florida. It shows the performance of 16 cotton varieties. This data represents only one year and one location, and readers are cautioned that test results should be considered over several locations and years before final conclusions are valid.

Mid- to full-season varieties that were evaluated:

1. DP 1050 B2RF
2. DP 1137 B2RF
3. DP 1252 B2RF
4. MON 12R242B2R2
5. CG 3787 B2RF
6. PHY 339 WRF
7. PHY 499 WRF
8. PHY 565 WRF
9. PHY 575 WRF
10. PHY 599 WRF
11. PHY 417 WRF

12. PHY 427 WRF

13. NG 1511 B2RF

14. NG 5315 B2RF

15. FM 1944GLB2

16. ST 6448GLB2

2013 Growing Conditions and Experimental Design

The study area soil type was a Tifton sandy loam with 2% organic matter and a pH of 6.5 with a history of cotton production. The field was planted in a rotation of peanut and cotton in 2012 and 2011, respectively. Each cotton variety was planted on May 14 under conventional tillage. Plots consisted of four, 25-ft. rows with 36 inches of row spacing and were replicated in four randomized complete blocks. Standard production practices for non-irrigated cotton production were followed throughout the season. Pendimethalin (Stealth, Loveland Products) 1 qt./ac. was applied on May 8 for pre-plant weed control, and glyphosate (Roundup, Monsanto) 22 oz./ac. was applied on June 20 and July 31 for post-emergence weed control. Dicrotophos (Bidrin 8, Amvac) 3.2 oz./ac. was applied on May 31, clothianidin (Belay, Valent) 4 oz./ac. was applied on July 30, and cyfluthrin (Tombstone, Loveland Products) 3.2 oz./ac. was applied on August 7 for insect control.

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Pyraclostrobin (Headline, BASF Crop Protection) 9 oz./ac. was applied on July 30 for disease control. Growth regulator Potenza was applied 12 oz./ac. on July 30 and 16 oz./ac. on August 7. Harvest aid treatments included Thidiazuron (Takedown SC, Loveland Products) 2.0 oz./ac. and carfentrazone+fluthiacet (Display, FMC) 0.5 oz./ac. applied on October 14. Cotton was harvested with a conventional spindle picker on November 4, and samples were sent to a commercial lab for fiber analysis.

Rainfall in May, June, and October was 7.1 in., 0.74 in., 4.21 in. below normal, respectively; rainfall in July, August, and September was 5.23 in., 1.37 in., and 3.65 in. above normal, respectively. Rainfall during the period totaled 33.23 inches, which was 1.61 inches below normal.

Table 1. Weather conditions during 2013 in Jay, FL.

Month	Total rainfall (in.)	Average minimum air temperature (°F)	Average maximum air temperature (°F)
May	0.7 (7.1 below normal*)	43.0	91.8
June	5.8 (0.7 below normal)	65.5	93.8
July	11.8 (5.2 above normal)	67.6	92.9
August	5.5 (1.4 above normal)	67.5	95.2
September	8.0 (3.7 above normal)	58.6	93.7
October	1.7 (4.2 below normal)	38.0	88.1
*“Normal” represents the mean for the past 54 years of records.			

Weather data was obtained from Florida Automated Weather Network (FAWN) station located on the Jay research farm, and “normal” represents the mean for the past 54 years of records (Table 1).

Summary

Stand counts were significantly different on May 28 when DP 1050 B2RF had the lowest population of 1.25 plants/ft., while PHY 399 WRF had the highest plant population of 2.56 plants/ft. (Table 2). Deer damage was noted, and dead plants per plot were also enumerated. PHY 427 WRF, PHY 499 WRF, DP 1050 B2RF, and NG 1511 B2RF had the most deer damage, while PHY 599 WRF had the least. Plots were replanted by hand on June 12 in areas where deer damage occurred, and seed germinated on June 17. A final stand count was taken on July 27, and there were no significant differences between varieties. Cotton stand ranged from 1.67 to 2.24 plants/ft. Differences in plant height were detected on August 15—PHY 599 WRF was the tallest variety (127.9 cm), while PHY 499 WRF was the shortest (93.0 cm). DP 1137, PHY 339 WRF, PHY 575 WRF, NG 5315 B2RF, FM 1944GLB2, and ST 6448GLB2 were all greater than 109 cm tall, and DP 1050 B2RF, DP 1252 B2RF, PHY 427 WRF were all less than 99 cm tall. The number of flowers open on August 15 ranged from 0.70 flowers/plant (DP 1252 B2RF and PHY 599 WRF) to 1.70 flowers/plant (PHY 499 WRF).

Table 2. Effect of variety on emergence, growth, and flower in cotton.

Variety	Plants/ft. ¹ (May 28)	Dead plants/plot ² (May 28)	Plants/ft. ¹ (July 27)	Height ³ (cm) (August 15)	Flowers/plant ³ (August 15)
DP 1050 B2RF	1.25 e	26.5 a-c	1.91	96.4 gf	0.88 de
DP 1137 B2RF	2.17 ab	8.5 cd	2.18	115.0 bc	0.93 c-e
DP 1252 B2RF	2.07 a-c	14.0 b-d	2.24	97.2 gf	0.70 e
MON 12R242B2R2	2.12 a-c	21.8 b-d	2.21	105.9 c-f	1.23 a-e
CG 3787 B2RF	1.61 c-e	16.0 b-d	1.98	106.2 c-f	0.88 de
PHY 339 WRF	2.56 a	9.8 cd	2.04	110.0 b-e	1.63 a
PHY 499 WRF	1.82 b-d	35.0 ab	1.98	93.0 g	1.70 a
PHY 565 WRF	1.84 b-d	10.0 cd	2.23	107.4 c-f	1.03 b-e
PHY 575 WRF	2.23 ab	23.0 bc	2.03	109.7 b-e	1.25 a-e
PHY 599 WRF	2.13 a-c	0.8 d	2.01	127.9 a	0.70 e
PHY 417 WRF	2.14 a-c	13.3 bd	1.57	103.2 d-g	1.68 a
PHY 427 WRF	1.40 de	47.3 a	2.07	98.7 e-g	1.33 a-d
NG 1511 B2RF	1.73 b-e	28.3 a-c	2.10	104.2 c-g	1.53 ab
NG 5315 B2RF	1.95 bc	9.3 cd	1.89	115.3 bc	1.25 a-e
FM 1944GLB2	2.08 a-c	6.8 cd	1.67	112.8 b-d	1.48 a-c
ST 6448GLB2	2.05 a-c	10.3 cd	1.79	120.1 ab	1.50 a-c
Mean	1.95	17.5	1.99	107.7	1.23
LSD	0.55	21.9	n.s.	11.4	0.60
CV	20.00	87.81	15.33	24.02	110.91
P(F)	0.0034	0.0101	0.1115	0.0001	0.0012

¹ Determined from counts of two, 25 ft. rows per plot. Plots replanted due to deer damage.

² Dead plants due to deer damage in plots.

³ Height and flower number determined from averaging 10 plants per plot. Means followed by the same letter(s) in a column are not significantly different, according to Fisher's Protected LSD ($P=0.05$).

PHY 339 WRF had the greatest number of open bolls on September 16 (22.3 open bolls/5 ft.), but it wasn't significantly different from PHY 565 WRF (Table 3). PHY 575 WRF had the lowest number of open bolls (5.5 open bolls/5 ft.), but it wasn't significantly different from NG 1511 B2RF, DP 1050 B2RF, DP 1252 B2RF, MON 12R242B2R2, CG 3787 B2RF, PHY 499 WRF, PHY 599 WRF, PHY 427 WRF, FM 1944GLB2, and ST 6448GLB2. PHY 599 WRF and ST 6448GLB2 were the highest yielding varieties with seed cotton yields of 4,344 and 4,288 lb./ac., respectively. Other varieties with similar yield included DP 1137 B2RF, MON 12R242B2R2, CG 3787 B2RF, PHY 339 WRF, PHY 565 WRF, PHY 575 WRF, NG 5315 B2RF, and FM 1944GLB2. PHY 417 WRF was the lowest yielding variety (2,944 lb./ac. of lint + seed), but it wasn't significantly different from DP 1050 B2RF, DP 1252 B2RF, PHY 427 WRF, and NG 1511 B2RF. Gin turn-out (GTO) ranged from 36% to 40% lint. NG 5315 B2RF and PHY 599 WRF had the highest lint yield of 1,620 lb lint/ac. (3.38 bales/ac.), while DP 1137 B2RF, MON 12R242B2R2, CG 3787 B2RF, PHY 565 WRF, FM 1944GLB2, and ST 6448GLB2 had similar yields. PHY 4167 WRF was the lowest yielding mid- to late-maturing variety of 1,122 lb. lint/ac. (2.34 bales/ac.).

Table 3. Effect of variety on open bolls and yield of cotton.

Variety	Open bolls^v (Sep. 16)	Yield			
		lb./ac.^w	GTO^x	Lint/ac.^y	Bales/ac.^z
DP 1050 B2RF	6.1 de	3448 c-e	39.1 ab	1344 c-e	2.80 c-e
DP 1137 B2RF	14.8 bc	4024 a-c	38.7 a-c	1558 a-c	3.25 a-c
DP 1252 B2RF	6.0 de	3424 c-e	40.0 a	1372 b-d	2.86 b-d
MON 12R242B2R2	8.6 c-e	4216 ab	38.0 b-e	1600 ab	3.33 ab
CG 3787 B2RF	6.8 de	3976 a-c	39.0 ab	1552 a-c	3.23 a-c
PHY 339 WRF	22.3 a	3744 a-d	36.6 ef	1372 b-d	2.86 b-c
PHY 499 WRF	11.6 c-e	3632 b-d	37.4 c-f	1358 b-e	2.83 b-e
PHY 565 WRF	18.9 ab	3920 a-d	36.4 f	1432 a-d	2.98 a-d
PHY 575 WRF	5.5 e	3696 a-d	36.1 f	1328 c-e	2.77 c-d
PHY 599 WRF	10.1 c-e	4344 a	37.3 d-f	1620 a	3.38 a
PHY 417 WRF	15.0 bc	2944 e	38.1 b-d	1122 e	2.34 e
PHY 427 WRF	7.9 de	3320 de	36.2 f	1204 de	2.51 de
NG 1511 B2RF	5.6 e	3504 c-e	38.3 b-d	1344 c-e	2.80 c-e
NG 5315 B2RF	12.1 cd	4184 ab	38.7 a-c	1620 a	3.38 a
FM 1944GLB2	7.8 de	4048 a-c	36.0 f	1456 a-c	3.03 a-c
ST 6448GLB2	7.4 de	4288 a	36.7 ef	1571 a-c	3.27 a-c
<i>Mean</i>	<i>10.4</i>	<i>3795</i>	<i>37.7</i>	<i>1428</i>	<i>2.98</i>
<i>LSD</i>	<i>6.5</i>	<i>651</i>	<i>0.01</i>	<i>247</i>	<i>0.51</i>
<i>CV</i>	<i>62.94</i>	<i>12.04</i>	<i>2.59</i>	<i>12.15</i>	<i>12.15</i>
<i>P(F)</i>	<i>0.0001</i>	<i>0.0021</i>	<i>0.0001</i>	<i>0.0023</i>	<i>0.0023</i>

^vDetermined from counts in a 5 ft. section of each row per plot.

^wWeight (lb./ac.) includes lint + seed.

^xGTO = gin turn out lint/seed cotton.

^yWeight of lint (lb./ac.).

^zBales/ac. are weight of lint only at 480 lb./bale.

Plots were harvested on November 4. Means followed by the same letter (s) in a column are not significantly different, according to Fisher's Protected LSD ($P=0.05$).

Fiber quality was classed at the USDA Classing Office in Memphis, Tennessee. Micronaire (Mic.), a measure of fiber fineness and maturity, ranged from 4.3 (PHY 417 WRF) to 4.9 (NG 1511 B2RF) in the mid- to full-maturing varieties (Table 4). Fiber length ranged from 1.12 to 1.20 inches and strength ranged from 28.5 to 33.0 g/tex. Uniformity, the ratio between mean length and upper-half mean length of fibers, ranged from 80.8% to 82.8%. High Volume Instrument (HVI) color grades included 31-2, 31-4, and 41-1, while leaf grades averaged 2.5–4.0. Net loan price, which was calculated based on \$0.52/lb. +/- premiums and discounts, ranged from 53.8¢/lb. (PHY 339 WRF) to 56.95¢/lb. (CG 3787 B2RF). Overall value per acre ranged from \$631 to \$918 with NG 5315 B2RF, DP 1137 B2RF, CG 3787 B2RF, PHY 599 WRF, MON 12R242B2RF, and ST 6448GLB2 having net values greater than \$800.

Table 4. Effect of variety on lint yield and fiber quality.

Variety	Gin turnout ^s (%)	Lint yield ^t (lb./ac.)	Mic. ^u	Fiber length ^v (in.)	Fiber strength ^w (g/tex)	Uniformity ^x (%)	HVI color ^y	Leaf grade ^z	Net loan price (¢/lb.)	Lint value (\$/ac.)
NG 5315 B2RF	38.7 a-c	1620 a	4.8 ab	1.13 fg	28.5 f	81.2	31-2	2.5 d	56.65	918
DP 1137 B2RF	38.7 a-c	1558 a-c	4.7 ab	1.14 d-g	28.6 f	82.4	31-2	2.5 d	56.85	886
CG 3787 B2RF	39.0 ab	1552 a-c	4.6 bc	1.17 b-e	29.3 d-f	82.7	31-2	2.8 cd	56.95	884
PHY 599 WRF	37.3 d-f	1620 a	4.3 d-f	1.17 b-e	30.2 c-e	81.4	41-1	3.5 a-c	54.25	879
MON 12R242B2R2	38.0 b-e	1600 ab	4.8 a	1.16 c-f	29.0 ef	82.8	41-1	3.5 a-c	54.15	866
ST 6448GLB2	36.7 ef	1571 a-c	4.8 ab	1.18 a-c	30.6 cd	80.8	41-1	3.3 a-d	54.25	852
FM 1944GLB2	36.0 f	1456 a-c	4.8 a	1.19 ab	33.0 a	81.8	41-1	2.8 cd	54.40	792
DP 1252 B2RF	40.0 a	1372 b-d	4.6 bc	1.15 c-g	29.2 ef	81.9	31-2	2.5 d	56.85	780
PHY 565 WRF	36.4 f	1432 a-d	4.6 bc	1.15 c-g	31.0 bc	81.4	41-1	3.0 b-d	54.35	778
DP 1050 B2RF	39.1 ab	1344 c-e	4.5 b-d	1.16 c-f	29.2 d-f	81.9	31-2	2.5 d	56.85	764
NG 1511 B2RF	38.3 b-d	1344 c-e	4.9 a	1.13 g	29.7 c-f	82.1	31-4	3.8 ab	56.30	757
PHY 575 WRF	36.1 f	1328 c-e	4.2 f	1.20 a	30.1 c-e	81.2	31-2	3.0 b-d	56.65	752
PHY 499 WRF	37.4 c-f	1358 b-e	4.7 ab	1.14 e-g	32.1 ab	82.5	41-1	3.3 a-d	54.45	739
PHY 339 WRF	36.6 ef	1372 b-d	4.5 c-e	1.17 a-d	31.1 bc	82.1	41-1	4.0 a	53.80	738
PHY 427 WRF	36.2 f	1204 de	4.4 d-e	1.12 g	30.3 c-e	80.8	41-1	3.3 a-d	54.20	653
PHY 417 WRF	38.1 b-d	1122 e	4.3 ef	1.13 fg	29.5 d-f	81.3	31-2	3.3 a-d	56.20	631
Mean	37.7	1428	4.6	1.15	30.1	81.8		3.1	54.25	775
LSD	0.01	247	0.2	0.03	1.4	1.35		0.8		
CV	2.59	12.15	3.49	1.98	3.22	1.16		18.88		
P(F)	0.0001	0.0023	0.0001	0.0001	0.0001	0.0061		0.0061		

^s Gin turnout = weight of lint as a percent of seed cotton weight, which is composed of lint, seed, trash, and excess moisture.

^t Weight of lint (lb./ac.).

^u Mic. (micronaire) = a measure of fiber fineness or maturity. An airflow instrument measures the air permeability of a given mass of cotton lint compressed to a fixed volume. Low “mike” values indicate finer or less mature fibers.

^v Fiber length = average fiber length of the longer one-half of the fibers sampled, in hundredths of an inch.

^w Fiber strength = force required to break a bundle of fibers one tex unit in size. A tex is the weight in grams of 1,000 meters of fiber. HVI clamp jaw spacing is 1/8 inch.

^x Uniformity = length uniformity is the ratio between the mean length and the upper-half mean length of the fibers, expressed as a percentage.

^y HVI Color = color grade is a function of white reflectance (Rd) and yellowness (+b) of the lint sample. The HVI color code identifies the quadrant of the Nickerson-Hunter cotton colorimeter diagram in which Rd and +b values intersect (USDA, 1999).

^z Leaf Grade = visual estimate of the amount of cotton plant leaf particles in a sample of lint. There are seven leaf grades represented by physical standards, plus a below-grade designation.

Entries are listed according to value in \$/ac. based on \$0.52/lb. +/- premium/discounts. Samples ginned at the University of Tennessee's West TN Research and Education Center and classed at the USDA Classing Office in Memphis, Tennessee.

Reference

USDA. 1999. “The Classification of Cotton.” Agricultural Marketing Service, *Agric. Handbook 566*. Rev. 1/99. Washington, DC. 23 pp.