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2013 Evaluation of Non-Irrigated Early-Maturing Cotton Varieties in Jay, Florida[1]

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This report includes a summary of the 2013 early-season cotton Official Variety Trial in Jay, Florida. It shows the performance of 11 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.

Early-season varieties that were evaluted

1.DP 1137 B2RF

2.DP 1321 B2RF

3.MON 12R224B2R2

4.DP 0912 B2RF

5.PHY 375 WRF

6.PHY 367 WRF

7.PHY 339 WRF

8.PHY 499 WRF

9.PHY 333 WRF

10.NG 1511 B2RF

11.AM 1550 B2RF

Figure 1. Cotton Variety Trial in Jay, Florida
Credits: Michael Donahoe

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-foot rows with 36 inches row spacing and were replicated in four randomized complete blocks. Standard production practices for non-irrigated

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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 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. Pyraclostribin (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, 0.74, and 4.21 inches below normal, respectively; rainfall in July, August, and September was 5.23, 1.37, and 3.65 inches above normal, respectively. Rainfall during the cotton growing season totaled 33.23 inches, which was 1.61 inches below normal. Weather data was obtained from the Florida Automated Weather Network (FAWN) station located on 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 PHY 375 WRF had the lowest population of 1.78 plants/ft., while DP 0912 had the highest plant population of 2.49 plants/ft. (Table 2). Deer damage was noted, and dead plants per plot were also enumerated. DP 1321 B2RF had the greatest damage, while no damage was detected in PHY 333 WRF and NG 1511 B2RF plots. Plots were replanted by hand on June 12 in areas where 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 an average of 1.76 to 2.04 plants/ft. Differences in plant height were detected on August 6—DP 1137 B2RF was the tallest variety (100.0 cm), while DP 0912 B2RF was the shortest (85.0 cm). No differences between varieties for the number of flowers per plant on August 6 were detected.

No differences between varieties for the number of open bolls on September 16 were detected (Table 3). Seed cotton yield ranged from 3,112 to 3,888 lb./ac., and no differences between varieties were detected. Significant differences were detected for gin turn-out (GTO) between varieties with PHY 333 WRF having the highest percentage of lint to seed cotton (40%), while DP 0912 B2RF had the lowest at 36%. Although differences were detected for GTO, no significant differences in total lint yield (1,169—1,417 lb. lint/ac.) or number of bales/ac. (2.43—2.95 bales/ac.) were detected between the eleven varieties tested. The three highest yielding varieties were MON 12R224B2R2, PHY 333 WRF, and DP 1137 B2RF.

Figure 2. Cotton harvest in Jay, Florida
Credits: Michael Donahoe

Table 1. Weather conditions during 2013 in Jay, Florida

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.

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

Variety	Plants/ft.[1] (May 28)	Dead plants/ plot[2] (May 28)	Plants/ft.[1] (July 27)	Height[3] (cm) (August 6)	Flowers/plant[3] (August 6)
DP 1137 B2RF	2.31 a-c	4.5 a-c	2.03	100.0 a	2.0
DP 1321 B2RF	2.06 cd	16.8 a	1.99	90.5 cd	2.0
MON 12R224B2R2	2.24 a-c	12.5 a-c	1.98	93.8 a-c	2.1
DP 0912 B2RF	2.49 a	0.0 c	2.01	85.0 d	1.4
PHY 375 WRF	1.78 d	11.5 a-c	2.01	92.2 b-d	1.7
PHY 367 WRF	2.26 a-c	4.3 a-c	2.04	94.9 a-c	2.2
PHY 339 WRF	2.20 a-c	14.8 ab	2.03	96.1 a-c	1.5
PHY 499 WRF	2.40 a-c	0.8 c	1.88	93.2 a-c	1.4
PHY 333 WRF	2.45 ab	0.0 c	1.86	98.1 ab	2.5
NG 1511 B2RF	2.27 a-c	0.0 c	1.76	91.9 b-d	2.1
AM 1550 B2R	2.14 bc	3.8 bc	1.79	88.7 cd	2.4
Mean	*2.24*	*6.3*	*1.94*	*93.1*	*1.9*
LSD	*0.35*	*12.5*	*n.s.*	*7.5*	*n.s.*
CV	*11.00*	*138.89*	*11.68*	*21.98*	*101.30*
P(F)	*0.0197*	*0.0489*	*0.6139*	*0.0773*	*0.1221*

[1]Determined from counts of two, 25-ft. rows per plot. Final count taken on July 27 after replant from deer damage.
[2]Deer damage caused dead plants that were observed on May 28.
[3]Height and flower number determined by 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), except for height means separated at alpha=0.10.

Table 3. Effect of variety on yield of cotton

Variety	Open bolls[v] (Sep. 16)	Yield			
		lb./ac.[w]	GTO[x]	Lint/ac.[y]	Bales/ac.[z]
DP 137 B2RF	5.5	3464	39.0 a-c	1356	2.83
DP 1321 B2RF	6.1	3224	36.9 d-f	1191	2.48
MON 12R224B2R2	5.3	3888	36.4 ef	1417	2.95
DP 0912 B2RF	6.9	3496	35.6 f	1246	2.60
PHY 375 WRF	4.4	3112	37.6 c-e	1169	2.43
PHY 367 WRF	12.6	3224	36.5 d-f	1179	2.46
PHY 339 WRF	11.8	3472	37.8 b-e	1311	2.73
PHY 499 WRF	7.1	3368	38.1 a-d	1284	2.68
PHY 333 WRF	7.4	3440	39.7 a	1367	2.85
NG 1511 B2RF	6.4	3312	39.3 ab	1299	2.71
AM 1550 B2R	6.0	3200	38.0 a-e	1220	2.54
Mean	*7.2*	*3382*	*37.7*	*1276*	*2.66*
LSD	*n.s.*	*n.s.*	*0.02*	*n.s.*	*n.s.*
CV	*81.35*	*10.81*	*3.15*	*11.73*	*11.73*
P(F)	*0.1283*	*0.2540*	*0.0004*	*0.3146*	*0.3146*

[v]Determined from counts in a 5-ft section of each row per plot.
[w]Weight (lb./ac.) includes lint + seed.
[x]GTO = gin turn out lint/seed cotton.
[y]Weight of lint (lb./ac.).
[z]Bales/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).

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

Variety	Gin turn out[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.)
MON 12R224B2R2	36.4 ef	1417	4.2 ef	1.17 a	30.0 bc	81.8 a–c	31-2	3.3 ab	56.65	803
DP 1137 B2RF	39.0 a–c	1356	4.7 a–c	1.13 bc	28.7 cd	82.1 ab	31-1	2.3 c	56.75	770
PHY 333 WRF	39.7 a	1367	4.4 c–e	1.18 a	30.3 b	82.0 ab	41-1	3.8 a	54.35	743
PHY 339 WRF	37.8 b–e	1311	4.3 de	1.17 a	30.5 ab	81.8 a–c	31-2	3.0 b	56.50	741
NG 1511 B2RF	39.3 ab	1299	4.9 a	1.13 bc	30.5 ab	81.5 a–c	41-1	3.0 b	54.20	704
PHY 499 WRF	38.1 a–d	1284	4.7 a–c	1.15 ab	31.7 a	82.6 a	41-1	3.8 a	54.45	704
DP 0912 B2RF	35.6 f	1246	4.7 a–c	1.11 cd	30.6 ab	82.3 a	31-2	3.0 b	56.50	699
AM 1550 B2R	38.0 a–e	1220	4.7 a–c	1.10 d	28.6 d	80.6 c	31-2	2.3 c	55.70	680
DP 1321 B2RF	36.9 d–f	1191	4.8 ab	1.11 cd	29.6 b–d	80.9 bc	31-2	3.0 b	56.20	669
PHY 375 WRF	37.6 c–e	1169	4.0 f	1.14 bc	29.8 b–d	81.9 ab	31.2	3.5 ab	56.45	660
PHY 367 WRF	36.5 d–f	1179	4.6 b–d	1.13 bc	29.8 b–d	81.7 a–c	41-1	3.3 ab	54.00	637
Mean	*37.7*	*1276*	*4.5*	*1.14*	*30.0*	*81.7*	*41*	*3.1*	*54.25*	*692*
LSD	*0.02*	*n.s.*	*0.3*	*0.03*	*1.3*	*1.3*		*0.7*		
CV	*3.15*	*11.73*	*4.9*	*1.79*	*3.1*	*1.13*		*16*		
P(F)	*0.0004*	*0.3146*	*0.0001*	*0.0001*	*0.0027*	*0.1576*		*0.0008*		

[s]Gin turn out = 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 lint value in $/Acre 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, TN.