2006 Cotton Research Report

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This report can be found on the Web at
http://www.ag.auburn.edu/aaes/communications/researchreports/06cottonrr.pdf

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VARIETY TRIALS

Cherokee County Cotton Variety Trial

C. H. Burmester and D. Derrick

Each season a cotton variety trial is conducted in Cherokee County to supplement yield results from the Alabama cotton variety trials. This large, cotton-growing area has unique soil types, and farmers often use results of this test to evaluate new cotton varieties for northeast Alabama. In 2006, the trial was conducted on the farm of Randall and Nick McMichen on a Holston fine sandy loam soil. Cotton was planted into a winter cover crop of wheat on April 28. Cotton varieties were planted in a two-replication strip trial to reduce possible soil variability. Eight rows were harvested from each variety and weighed in a boll buggy for yield determination.

This trial was designed to test the yield potential of new cotton varieties containing both the Bollguard II and Roundup Flex genetic modifications. A total of ten varieties were planted. All varieties received identical herbicide and insecticide treatments. Varieties were spindle picked, and a sample from each variety was ginned on a tabletop gin for lint percentage and quality determinations.

Yield and Quality of Cotton Varieties in the Cherokee County Trial, 2006

Variety[1]	Seed cotton yield	Lint[2]	Lint yield	Mic.[3]	Length	Strength	Uniformity
	lb/ac	*pct*	*lb/ac*	*units*	*in*	*g/tex*	*pct*
PHY 485 WRF	2050	0.4539	930	5.0	35	28.9	82.6
DP 117 B2RF	1670	0.4375	730	4.6	35	29.2	81.4
FM 9063 B2RF	1730	0.4200	727	4.5	36	29.9	81.0
DP 143 B2RF	1920	0.4169	800	4.5	36	26.7	80.4
ST 4554 B2RF	1650	0.4169	688	4.7	34	30.6	82.0
DG 2520 B2RF	1480	0.4089	605	4.3	34	27.0	80.6
BCG 4630 B2RF	1380	0.4006	552	4.1	35	25.8	81.5
ST 4357 B2RF	1510	0.4000	604	4.3	34	27.2	81.5
BCG 3255 B2RF	1490	0.3875	577	3.5	33	25.9	82.8
CG 3020 B2RF	1340	0.3844	515	3.9	33	26.2	82.8

[1] CG= Cropland Genetics, DP= Deltapine, BCG=Beltwide Cotton Genetics, ST= Stoneville, PHY= Phytogen, FM= Fiber Max, DG= Dyna-Gro; CG 3020 and BCG 3255 = same variety number 37001G; DG 2520, BCG 4630, ST 4357 = same variety number 45001G. [2] Lint percent determined on a small gin without cleaners. This percentage is usually higher than normal turn-out, but consistent between varieties. [3] Mic. = micronaire.

Very cold weather in May resulted in stunted cotton growth. Fusarium wilt also developed in the plot area, and stand loss was noted in all plots. During the summer abnormally dry conditions further reduced the cotton yield potential in this area. Surprisingly all varieties produced cotton yields over one bale per acre even under these adverse conditions.

Enhancing Cotton Variety Selection

C. D. Monks, C. H. Burmester, W. C. Birdsong, R. W. Goodman, D. Derrick, W. G. Griffith, R. P. Yates, L. Kuykendall, and R. L. Petcher

The project Enhancing Cotton Variety Selection in On-Farm Trials was approved in 2005 for funding during the 2006 growing season. Cotton varieties for this project were supplied by Delta and Pine Land, Stoneville, FiberMax, and Phytogen seed companies. In addition to the larger seed companies, Beltwide Cotton Genetics, Cropland Genetics, and DynaGro also supplied seed. The trials were primarily focused on evaluation of the Roundup Flex varieties and were initiated during April or May of 2006 as cited in Table 1.

Tables 2 through 6 include the seed cotton yields from the 2006 on-farm trials; however, the final lint turnout, lint yield, and fiber quality information will be posted at www.alabamacotton.com when they become available. While yields were not recorded in Fayette, Shelby, and Marengo counties due to severe drought stress throughout most of the growing season, seed cotton samples were collected for lint quality analysis and data will be posted on the Alabama Cotton Web site. In general, the overriding influence on the results of these trials was the severe drought stress in most areas. As a result, variety performance was better for the longer maturing groups.

Table 1. County Locations of Trial Sites and Contact Information

County	Regional agent	Contact information
Barbour	William Birdsong[1]	birdswc@auburn.edu
Cherokee	David Derrick	dderrick@aces.edu
Elmore	Leonard Kuykendall	lkuykend@aces.edu
Escambia	Richard Petcher	rpetcher@aces.edu
Fayette	Warren Griffith	griffwg@auburn.edu
Macon	Leonard Kuykendall	lkuykend@aces.edu
Marengo	Rudy Yates	ryates@aces.edu
Shelby and Tuscaloosa	Warren Griffith	griffwg@auburn.edu

[1] Regional agronomist in southeast Alabama; all others listed are regional agronomy agents.

TABLE 2. CHEROKEE COUNTY NO-TILL COTTON VARIETY TRIAL, 2006[1]

Variety [2]	Seed cotton yield	Turnout [3]	Lint yield [4]	Mic.[5]	Length	Strength	Uniformity
	lb/ac	*pct*	*lb/ac*	*units*	*in*	*g/tex*	*pct*
CG 3020 B2RF	1340	0.38	515	3.9	33	26.2	82.8
DP 117 B2RF	1670	0.44	730	4.6	35	29.2	81.4
BCG 3255 B2RF	1490	0.39	577	3.5	33	25.9	82.8
ST 4554 B2RF	1650	0.42	688	4.7	34	30.6	82.0
PHY 485 WRF	2050	0.45	930	5.0	35	28.9	82.6
FM 9063 B2RF	1730	0.42	727	4.5	36	29.9	81.0
DP 143 B2RF	1920	0.42	800	4.5	36	26.7	80.4
DG 2520 B2RF	1480	0.41	605	4.3	34	27.0	80.6
BCG 4630 B2RF	1380	0.40	552	4.1	35	25.8	81.5
ST 4357 B2RF	1510	0.40	604	4.3	34	27.2	81.5

[1] Producer: McMichen Farms; planting date was April 28, 2006; harvest date was September 21, 2006; Two replications were harvested together and a single weight recorded.

[2] CG=Cropland Genetics, DP=Delta and Pine Land, BCG=Beltwide Cotton Genetics, ST=Stoneville, PHY=Phytogen, FM=Fiber Max, DG=Dyna-Gro; CG 3020 and BCG 3255 = same variety number 37001G; DG 2520, BCG 4630, ST 4357 = same variety number 45001G.

[3] Lint turnout was determined on a small gin without cleaners. This percentage is usually higher than normal turnout but is consistent for comparison between varieties.

[4] Yields were limited by dry weather during the summer and Fusarium wilt, which developed after cold conditions in May. The wilt killed some plants and stunted the root system over the entire trial area.

[5] Mic. = micronaire.

TABLE 3. ELMORE COUNTY NO-TILL COTTON VARIETY TRIAL, 2006[1]

Variety	Maturity group	Seed cotton yield
		lb/ac
FM 991 BR	F	1884
DP 515 BGRR	M-F	1756
DP 555 BGRR	F	1743
FM 991 R	F	1720
BW 8391 B2RF	F	1704
PHY 425 RF	E-M	1697
DP 445 BR	M	1606
DP 143 B2RF	M-F	1573
ST 6565 B2RF	F	1515
PHY 485 WRF	E-M	1508
DP 147 RF	M-F	1501
DP 488 BR	M-F	1499
PHY 480 WRF	E-M	1496
DP 494 R	M-F	1491
DP 434 R	E	1400
DP 455 BR	M-F	1371
FM 9063 B2RF	E	1340
FM 9060 RF	E	1287
DP 454 BR	M	1277
PHY 310 R	E	1194

[1] Producer was Sanford Peeples. Plots were planted in four strips of four rows per variety; each strip was approximately 1200 to 1400 feet. Seed were treated with the company's standard fungicide package with no additional seed treatment applied. Temik at 5 pounds per acre was applied in-furrow at planting for thrips and nematode management.

Table 4. Macon County No-Till Cotton Variety Trial, 2006[1]

Variety	Maturity group	Seed cotton yield *lb/ac*
DP 515 BGRR	M-F	2081
ST 6565 B2RF	F	2081
DP 147 RF	M-F	2076
ST 6611 B2RF	F	2057
DG 2520 B2RF	M	2000
DP 555 BGRR	F	1968
DP 143 B2RF	M-F	1961
DP 455 BGRR	M-F	1768
FM 9063 B2F	E	1740
PHY 485 WRF	E-M	1691
PHY 370 WR	E	1587
FM 991 BR	F	1579
PHY 480 WR	E-M	1577
FM 9060 F	E	1570
DG 2100 B2RF	E	1550
BW 8391 B2RF	F	1352
BW 4630 B2F	M	1261

[1] Producer was Robert Walters. Plots were planted in four strips of four rows per variety; each strip was approximately 1200 feet. Seed were treated with the company's standard fungicide package with no additional seed treatment applied. Temik at 5 pounds per acre was applied in-furrow at planting for thrips and nematode management.

Table 5. Escambia County No-Till Cotton Variety Trial, 2006[1]

Variety	Maturity group	Lint cotton yield [2] *lb/ac*
DP 555 BGRR	F	1212
DP 515 BGRR	M-F	1032
PHY 480 WR	E-M	872
ST 4357 B2RF	E-M	795
BW 8391 B2F	F	790
DP 147 RF	M-F	765
DP 434 R	E	765
CG 3020 B2RF	Very Early	758
PHY 485 WRF	E-M	750
CG 4020 B2RF	E-M	744
FM 991 BR	F	734
FM 960 BR	E-M	732
DG 2520 B2RF	M	726
BW 4630 B2F	M	716
ST 4554 B2RF	E-M	710
ST 6565 B2RF	F	707
DG 2100 B2RF	E	705
DP 455 BGRR	M	688
DP 143 B2RF	M-F	667
FM 9060 F	E	567
ST 6611 B2RF	F	557
FM 9063 B2F	E-M	556

[1] Producer was David Womack. Plots were planted in 36-inch rows with four-row plots on May 17 and harvested on October 10, 2006. The trial was under duress from severe drought stress and nematode pressure, resulting in yield variations across the test area.

[2] Lint yield presented is based on an assumed lint turnout of 40 percent; however, final results with actual turnout will be posted at www.alabamacotton.com when available.

Table 6. Tuscaloosa County No-Till Cotton Variety Trial, 2006[1]

Variety	Maturity group	Seed cotton yield *lb/ac*
BW 8391 B2RF	F	2770
ST 6565 B2RF	F	2730
DP 147 RF	M-F	2480
DP 143 B2RF	M-F	2465
PHY 480 WRF	E-M	2445
DP 555 BGRR	F	2405
PHY 485 WRF	E-M	2395
DP 455 BGRR	M-F	1760

[1] Producer was Forrest Wiggins. Plots were planted in single strips of six rows per variety; each strip was approximately 1200 to 2000 feet. Seed were treated with the company's standard fungicide package with no additional seed treatment applied. Temik at 5 pounds per acre was applied in-furrow at planting for thrips and nematode management.

SCREENING OF COMMERCIAL COTTON VARIETIES AGAINST FUSARIUM WILT, 2006

W. S. Gazaway and K. Glass

Fusarium wilt has been successfully controlled through the use of resistant varieties during the past 50 years, but many of the newer genetically engineered cotton varieties do not have good Fusarium wilt resistance. Consequently, wilt has become a serious problem in wilt-infested fields where these varieties are grown. The Fusarium wilt nursery at the Plant Breeding Unit, Tallassee, Alabama, helps us identify these susceptible commercial varieties as well as the Fusarium wilt resistant varieties. A list of the commercial varieties and their relatively susceptibility or resistance to Fusarium wilt is published in the Alabama Cotton IPM recommendations and in the Cotton Variety Report annually.

In 2006, fifteen of the most commonly grown cotton varieties were screened for wilt. Rowden, an extremely susceptible cotton variety, was used as the Fusarium wilt susceptible control. Plots were 20 feet long and 16 rows wide. The test contained five replicates. Plants were first evaluated for wilt soon after they reached the first true leaf stage. Thereafter, plots were evaluated for wilt on a weekly basis throughout the growing season until just before harvest. Plants were counted and removed as soon as they showed symptoms of Fusarium wilt.

A list containing the past 3 years of commercial cotton varieties and their relative susceptibility is shown in the table. Fusarium wilt incidence was especially low this year (2006) compared to previous years. This low incidence of Fusarium wilt makes it difficult to accurately assess susceptibility or resistance among the commercial cotton varieties tested in 2006. Dry weather which suppressed root-knot nematode populations was a major reason for this low incidence of Fusarium wilt disease.

COMMERCIAL COTTON VARIETIES' RESPONSE TO FUSARIUM WILT

Cotton variety	——Percent Fusarium wilt——		
	2004	2005	2006
Rowden	79	68	44
DP 454 BG/RR	—[1]	19	4
DP 555 BG/RR	7	5	3
DP 147 B2AF	—	—	2
FM 965 LLB2	—	—	2
PHY 480 WR	—	—	2
PHY 485 WRF	—	—	1
FM 960 BR	10	3	1
DP 143 B2RF	—	—	1
DP 515 BG/RR	—	—	1
FM 9063 B2F	—	—	1
ST 6611 B2RF	—	—	1
ST 4664 RF	—	—	0
DP 445 BG/RR	—	—	0
DG 2520 B2RF	—	—	0
CG 3020 B2RF	—	—	0
ST4892 BR	10	8	—
PHY 410 RR	8	10	—
FM 989 BR	15	1	—
ST 5599 BR	2	6	—
DP 491	3	4	—
DP 444 BG/RR	3	2	—
FM 958 LL	59	18	—
DP 449 BG/RR	5	7	—
ST 5303 R	5	3	—
DP 488 BG/RR	3	5	—
DP 451 BG/RR	1	—	—
ST 4686 R	—	1	—
FM 991 BR	—	1	—

[1] — = cotton variety not tested that year.

Evaluation of Early Season Flex Cotton Varieties for Response to Boll Rot Disease in Alabama, 2006

K. S. Lawrence, K. Glass, G. W. Lawrence, and M. D. Pegues

A cotton variety trial was planted on May 3 at the Auburn University, Gulf Coast Research and Extension Center, Fairhope, Alabama. The soil type was a Malbis fine sandy loam. Plots consisted of two rows, 25 feet long, with a between-row spacing of 38 inches. Plots were arranged in a randomized complete-block design with four replications. A 10-foot alley separated blocks.

Cotton boll rot was evaluated by recording the number of healthy bolls and diseased bolls from a 0.001 acre section within each plot. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Plots were harvested on September 30. Disease rating data were statistically analyzed using PROC GLM, and means were compared with Fisher's protected least significant difference test ($P \leq 0.05$).

Weather conditions were dry in 2006 and were not favorable for inciting cotton boll rot and hard lock. The boll rot disease index averaged only 1.4 percent for the early season cotton varieties with a high of 10.1 percent for CG 3520 B2RF to a low of less than 1 percent for many varieties tested. Hard lock incidence was similar with an average of 3.9 percent incidence. Yields were also affected by the drought. The average early season yield was 1205 but ranged from a high of 1518 for Deltapine DP 555 BG/RR (full season check variety) to a low of 947 for STX 0501 RF. No correlations were observed between seed cotton yield and boll rot or hard lock disease incidence.

Lint Yields and Disease Indices for Early Season Flex Cotton Varieties

Variety	Average yield *lb/ac*	Average lint *pct*	Healthy bolls[1]	Boll rot [2] *pct*	Hardlock [3] *pct*
Deltapine DP 555 BG/RR [4]	1518	0.44	76	0.1	5.3
DP 147 RF	1414	0.41	74	2.7	9.5
DP 117 B2RF	1358	0.41	63	0.1	3.2
Fiber Max FM 9060 F	1354	0.41	71	0.1	4.2
Fiber Max FM 9068 F	1340	0.40	62	3.2	3.2
PHY 425 RF	1337	0.41	74	0.1	6.8
DP 110 RF	1332	0.40	61	4.9	9.8
DP 143 B2RF	1312	0.39	87	0.1	10.3
PHY 485 WRF	1300	0.41	69	4.3	5.8
BW -4630 B2F	1275	0.38	91	0.1	1.1
Fiber Max FM 9063 B2F	1271	0.40	72	0.1	1.4
CG 4020 B2RF	1264	0.39	63	0.1	1.6
CG 3520 B2RF	1261	0.37	79	10.1	1.3
Deltapine DP 444BG/RR [4]	1256	0.41	57	0.1	3.5
Dyna Gro 2100 B2RF	1242	0.37	69	1.4	0.0
ST 4357B2RF	1242	0.38	96	0.1	3.1
STX 0505 B2RF	1236	0.40	69	0.1	1.4
Stoneville ST 5599BR [4]	1228	0.40	86	0.1	3.5
DPLX 06W650F	1228	0.41	67	3.0	3.0
Dyna Gro 060642 B2RF	1195	0.36	62	1.6	8.1
STX 0504 B2RF	1182	0.40	100	0.1	3.0
BW -8391 B2F	1181	0.36	68	0.1	8.8
Fiber Max FM 960BR [4]	1135	0.39	88	0.1	1.1
DPLX 06W660F	1134	0.41	65	3.1	3.1
Dyna Gro 2520 B2RF	1120	0.38	60	0.1	3.3
ST 4664RF	1116	0.40	52	3.8	9.6
CG 3020 B2RF	1112	0.36	74	1.4	1.4
ST 4554B2RF	1107	0.40	60	0.1	3.3
STX 0503 RF	1103	0.42	63	0.1	1.6
ST 4700 B2RF	1054	0.38	62	0.1	3.2
BW-2038 B2F	1052	0.38	82	2.4	1.2
Dyna Gro 2242 B2RF	1024	0.37	83	0.1	0.0
BW-3255 B2RF	978	0.36	90	0.1	4.4
BW-4021 B2F	963	0.36	89	2.2	1.1
STX 0501 RF	947	0.37	76	2.6	3.9
Test average	**1205**	**0.39**	**73.1**	**1.4**	**3.9**
LSD P≤0.05			**19**	**5.7**	**4.8**

[1] Healthy bolls per meter of row.

[2] Disease index = (number diseased bolls / total number healthy bolls) ×100.

[3] Hardlock index = (number hardlock bolls / total number healthy bolls) ×100.

[4] Non-flex check variety.

Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq$

EVALUATION OF FULL SEASON FLEX COTTON VARIETIES FOR RESPONSE TO BOLL ROT DISEASE IN ALABAMA, 2006

K. S. Lawrence, K. Glass, G. W. Lawrence, and M. D. Pegues

A cotton variety trial was planted on May 3 at the Auburn University, Gulf Coast Research and Extension Center, Fairhope, Alabama. The soil type was a Malbis fine sandy loam. Plots consisted of two rows, 25 feet long, with a between-row spacing of 38 inches. Plots were arranged in a randomized complete-block design with four replications. A 10-foot alley separated blocks.

Cotton boll rot was evaluated by recording the number of healthy bolls and diseased bolls from a 0.001 acre section within each plot. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Plots were harvested on September 30. Disease rating data were statistically analyzed using PROC GLM, and means were compared with Fisher's protected least significant difference test ($P \leq 0.05$).

Weather conditions were dry in 2006 and were not favorable for inciting cotton boll rot and hard lock. The boll rot disease index averaged 10.0 percent for the full season flex cotton varieties with a high of 15.57 percent for Fiber Max FM 9063 B2F to a low of 4.1 percent for DP 164 B2RF. Hard lock incidence was similar with an average of 8.0 percent incidence. Yields were also severely affected by the drought. The average full season flex variety yield was 1193 but ranged from a high of 1756 for Deltapine DP 555 BG/RR (non-flex check variety) to a low of 919 for ST 6565 B2RF. No correlations were observed between seed cotton yield and boll rot or hard lock disease incidence.

LINT YIELDS AND DISEASE INDICES FOR FULL SEASON FLEX COTTON VARIETIES

Variety	Average yield *lb/ac*	Average lint *pct*	Healthy bolls[1]	Boll rot [2] *pct*	Hardlock [3] *pct*
Deltapine DP 555 BG/RR [4]	1756	0.43	71	9.9	8.9
Stoneville ST 5599BR	1355	0.42	77	6.3	6.3
DP 147 RF	1291	0.41	69	12.7	10.7
ST 6622B2RF	1215	0.39	73	10.1	8.4
Fiber Max FMX 0680 B2F	1186	0.39	65	11.9	9.2
PHY 745 WRF	1173	0.39	72	11.2	8.9
Fiber Max FM 9063 B2F	1162	0.38	65	15.5	13.8
DP 143 B2RF	1153	0.40	57	14.4	10.7
DP 167 RF	1152	0.39	76	6.5	5.8
DP 164 B2RF	1146	0.39	81	4.1	4.1
Fiber Max FM 960BR	1135	0.39	71	8.0	8.0
ST 6611B2RF	1125	0.38	67	10.4	7.8
Fiber Max FM 9068 F	1106	0.39	69	6.1	4.8
Deltapine DP 444BG/RR	1027	0.40	75	11.7	9.4
ST 6565 B2RF	919	0.37	71	10.1	9.1
Test average	**1193**	**0.40**	**70**	**10.0**	**8.0**
LSD P≤ 0.05			**16**	**11.8**	**8.9**

[1] Healthy bolls per meter of row.

[2] Disease index = (number diseased bolls / total number healthy bolls) ×100.

[3] Hardlock index = (number hardlock bolls / total number healthy bolls) ×100.

[4] Non-flex check variety.

Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.10$).

Evaluation of Full Season Cotton Varieties for Response to Boll Rot Disease in Alabama, 2006

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A cotton variety trial was planted on May 3 at the Auburn University, Gulf Coast Research and Extension Center, Fairhope, Alabama. The soil type was a Malbis fine sandy loam. Plots consisted of two rows, 25 feet long, with a between-row spacing of 38 inches. Plots were arranged in a randomized complete-block design with four replications. A 10-foot alley separated blocks.

Cotton boll rot was evaluated by recording the number of healthy bolls and diseased bolls from a 0.001 acre section within each plot. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Plots were harvested on September 30. Disease rating data were statistically analyzed using PROC GLM, and means were compared with Fisher's protected least significant difference test ($P \leq 0.05$).

Weather conditions were dry in 2006 and were not favorable for inciting cotton boll rot and hard lock. The boll rot disease index averaged 7.0 percent for the full season cotton varieties with a high of 19.7 percent for Stoneville ST 5599BR to a low of 1.3 percent for Fiber Max FMX 9166B2LL. Hard lock incidence was similar with an average of 5.7 percent incidence. Yields were also affected by the drought. The average full season variety yield was 1344 but ranged from a high of 1710 for Deltapine DP 555 BG/RR to a low of 796 for Dyna Gro 0A0265. No correlations were observed between seed cotton yield and boll rot or hard lock disease incidence.

Lint Yields and Disease Indices for Full Season Cotton Varieties

Variety	Average yield *lb/ac*	Average lint *pct*	Healthy bolls[1]	Boll rot [2] *pct*	Hardlock [3] *pct*
Deltapine DP 555 BG/RR	1710	0.43	56.7	14.5	10.8
Deltapine DP 493	1595	0.44	68.7	3.6	2.9
Fiber Max FMX 95007-80LL	1509	0.42	75.7	4.3	3.6
Deltapine DP 515BG/RR	1494	0.42	62.0	7.5	3.9
Deltapine DP 488 BR	1491	0.40	70.7	6.4	2.4
Deltapine DP 454BG/RR	1393	0.43	87.0	5.6	4.6
Deltapine DP 494 RR	1383	0.42	88.0	5.6	4.6
Deltapine DP 455BG/RR	1355	0.43	81.7	7.9	6.9
Fiber Max FMX 9166B2LL	1349	0.40	78.0	1.3	1.3
Stoneville ST 5599BR	1346	0.41	44.0	19.7	19.0
Fiber Max FM 991BR	1273	0.39	68.7	8.4	8.4
Deltapine DP 449 BG/RR	1259	0.40	60.0	3.4	2.8
Fiber Max FM 960BR	1239	0.40	75.7	3.2	2.2
Fiber Max FM 988 LLB2	1193	0.38	79.0	4.7	4.7
Deltapine DP 445BG/RR	1113	0.41	78.7	3.5	3.5
Dyna Gro 0A0265	796	0.37	61.0	11.8	9.8
Test average	**1344**	**0.41**	**71.0**	**7.0**	**5.7**
LSD P≤0.05			**9.3**	**6.1**	**6.4**

[1] Healthy bolls per meter of row.

[2] Disease index = (number diseased bolls / total number healthy bolls) ×100.

[3] Hardlock index = (number hardlock bolls / total number healthy bolls) ×100.

Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.10$).

CROP PRODUCTION

Managing Reniform Nematodes in Cotton with Crop Rotation, 2006

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Cotton farmers have routinely used nematicides to control reniform nematodes. Although effective in the short term, nematicides are expensive and do not always produce the desired economical returns. Since there are no reniform nematode-resistant commercial cotton varieties, rotation with non-host crops provides the only reliable alternative for their management. Two previous rotation studies indicated that 1-year and/or 2-year corn or peanut rotations can effectively reduce reniform nematodes to a manageable population. Moreover, rotation with these non-host crops can have additional benefits by improving weed control, soil fertility, and soil texture. However, we need to determine if the use of nematicides in cotton following a 1-year or 2-year rotation with peanut or corn will improve cotton yields. Our objective is to determine if summer crop rotation can effectively improve cotton production in reniform nematode-infested fields and if the use of a nematicide in cotton following crop rotation is profitable.

This is the second year of a multi-year project that was initiated in 2005. The project was placed near Huxford, Alabama in a cotton field, heavily infested with reniform nematodes. The soil in this field is a sandy, loam (56 percent sand, 29 percent silt, and 15 percent clay). The rotation/nematicide treatments are summarized in Table 1. The test was designed so that cotton following 1- and 2- year or 3-year rotations with non-host summer crops can be harvested and compared directly every year after the third year of cropping (Table 1).The test is a split-plot design with nematicides as the primary factor and summer non-host crops as the secondary factor. All non-host crop plots and continuous cotton plots were 16 rows wide. These plots were split into eight-row subplots when cotton follows cotton, peanut, soybean, or corn. One of the two cotton subplots was randomly selected and treated with a nematicide. The other cotton subplot did not receive a nematicide. Continuous cotton plots were treated likewise with one subplot (eight rows) receiving a nematicide and the other remaining untreated. Plots were 40 feet long. Treatments were replicated four times.

The entire field was planted in the winter of 2005 with a rye cover crop that was cut in the spring prior to planting the summer crops. The field was planted on raised beds spaced at 36-inch intervals. The nematicide Telone II (3 gallons per acre) was injected 18 inches deep into raised seedbeds to designated nematicide plots on April 13. Cotton seed (DPL 449BG/RR), treated with Cruiser® for early season insect control, was planted on May 17, 2006. Corn (Pioneer 33M53RR), peanut (AP3), and soybean (DP 5634RR) were planted in the non-host plots on the same day as cotton. Soil samples for nematode analyses were collected from the two center rows of each four-row subplot just prior to fumigation and on November 13, 2006. Cotton was harvested from the two center rows of each four-row subplot on October 2, 2006. Insect control, weed control, and all other agronomic practices were followed according to Auburn University recommendations.

Telone II improved cotton yield overall (Table 2). However, Telone was most effective when applied to cotton following cotton (Table 4). When applied to cotton following soybean and peanut, Telone produced a significant increase in yield as well. Telone did not increase yield significantly when applied to cotton following corn, however (Table 4). Telone did appear to be equally effective in increasing cotton yield as a 1-year rotation with corn. Cotton treated with Telone following peanut in 2005 produced the highest cotton yield in 2006.

Looking at the impact of non-host crops alone, a 1-year peanut or corn rotation produced significantly larger cotton yields than a 1-year rotation with soybean or than continuous cotton (Table 3). The yield increase is reflected in smaller fall populations of reniform nematode following one season of peanut and corn (Table 5). It is also noteworthy to point out that the smallest reniform populations occurred in the plots following 2 years of peanut and corn. Whether the smaller reniform populations in the 2-year peanut and corn rotation systems will reflect an even greater increase in cotton yield will not be known until next year (2007) when cotton yield data will be taken from both the 1-year and the 2-year rotation systems.

This study further confirms previous rotation studies that reniform nematode populations rebound to damaging levels after just one season of cotton, regardless of the crop grown the previous year (see treatments 7 through 10 in Table 5). It also re-confirms that cotton should not be grown in successive years in rotation systems in this area of the state.