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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Editors

K. S. Lawrence
Associate Professor
Entomology and Plant Pathology
Auburn University

C.D. Monks
Professor and Extension Specialist
Agronomy and Soils
Auburn University

D.P. Delaney
Extension Specialist IV
Agronomy and Soils
Auburn University

Contributors

J. R. Akridge
Superintendent
Brewton Agricultural Research Unit
Brewton, Alabama

F. J. Arriaga
Affiliate Assistant Professor
Agronomy and Soils, Auburn University
USDA-National Soil Dynamics Lab.

K. S. Balkcom
Affiliate Assistant Professor
Agronomy and Soils, Auburn University
USDA-National Soil Dynamics Lab.

J. Bergtold
Affiliate Assistant Professor
Agronomy and Soils, Auburn University
USDA-National Soil Dynamics Lab.

W. C. Birdsong
Regional Agronomist Southeast Alabama
Alabama Cooperative Extension System

C. Brodbeck
Engineer II
Biosystems Engineering, Auburn University

C. H. Burmester
Extension Agronomist
Tennessee Valley Research and Extension Center, Belle Mina, Alabama

L. M. Curtis
Professor and Extension Spec., Emeritus
Biosystems Engineering, Auburn University

D. P. Delaney
Extension Specialist IV
Agronomy and Soils, Auburn University

D. Derrick
Regional Extension Agent
Cherokee County
Alabama Cooperative Extension System

C. Dillard
Agricultural Program Associate
Agronomy and Soils, Auburn University

M. P. Dougherty
Assistant Professor
Biosystems Engineering, Auburn University

B. Durbin
Superintendent
Field Crops Unit, E.V. Smith Research Center
Shorter, Alabama

B. Durham
Agricultural Program Associate
Tennessee Valley Research and Extension Center, Belle Mina, Alabama

B. L. Freeman
Extension Entomologist
Entomology and Plant Pathology
Auburn University

J. P. Fulton
Assistant Professor
Biosystems Engineering, Auburn University

W. S. Gazaway
Professor and Extension Spec., Emeritus
Entomology and Plant Pathology
Auburn University

K. Glass
Agricultural Program Associate
Agronomy and Soils, Auburn University

R. W. Goodman
Associate Professor
Agricultural Economics and Rural Sociology
Auburn University

W. G. Griffith
Regional Extension Agent
Fayette County
Alabama Cooperative Extension System

M. H. Hall
Regional Extension Agent
Madison County
Alabama Cooperative Extension System

D. H. Harkins
Agricultural Program Assistant
Tennessee Valley Research and Extension Center, Belle Mina, Alabama

T. B. Hatchett
Graduate Research Assistant
Entomology and Plant Pathology
Auburn University

J. Holliman
Superintendent
Black Belt Research and Extension Center, Marion Junction, Alabama

G. Huluka
Associate Professor
Agronomy and Soils, Auburn University

L. Kuykendall
Regional Extension Agent
Autauga County
Alabama Cooperative Extension System

G. W. Lawrence
Entomology and Plant Pathology
Mississippi State University

K. S. Lawrence
Associate Professor
Entomology and Plant Pathology
Auburn University

P. L. Mask
Assistant Director, Ag, For, Nat. Res.
Alabama Cooperative Extension System

C. C. Mitchell
Professor and Extension Agronomist
Agronomy and Soils, Auburn University

C. D. Monks
Professor and Extension Specialist
Agronomy and Soils, Auburn University

D. P. Moore
Superintendent
Prattville Agricultural Research Unit
Prattville, Alabama

S. Nightengale
Superintendent, Plant Breeding Unit
E. V. Smith Research Center
Tallassee, Alabama

B. E. Norris
Superintendent
Tennessee Valley Research and Extension Center, Belle Mina, Alabama

S. H. Norwood
Regional Agent, Tennessee Valley REC
Alabama Cooperative Extension System

Contributors, continued

M. G. Patterson
Professor
Agronomy and Soils, Auburn University

M. D. Pegues
Associate Superintendent
Gulf Coast Research and Extension Center
Fairhope, Alabama

R. L. Petcher
Regional Extension Agent
Washington County
Alabama Cooperative Extension System

A. J. Price
Affiliate Assistant Professor
Agronomy and Soils, Auburn University
USDA-National Soil Dynamics Lab.

J. N. Shaw
Associate Professor
Agronomy and Soils, Auburn University

R. H. Smith
Professor and Extension Spec., Emeritus
Entomology and Plant Pathology
Auburn University

D. B. Weaver
Professor
Agronomy and Soils, Auburn University

R. P. Yates
Regional Extension Agent
Marengo County
Alabama Cooperative Extension System

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	Average lint	Healthy bolls[1]	Boll rot [2]	Hardlock [3]
	lb/ac	*pct*		*pct*	*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 $P \leq 0.05$			**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 ≤

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 $P \leq 0.05$			**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

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 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

W. S. Gazaway, K. S. Lawrence, and J. R. Akridge

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.

Table 1. Rotation Scheme for Non-host Crops[1]

Trt. no.	Treatment	Treatment	2005	2006	2007	2008	2009	2010
1	Corn 1 Year	Nematicide	cotton	corn	cotton	corn	cotton	corn
2	Corn 1 Year	No nematicide	cotton	corn	cotton	corn	cotton	corn
3	Peanut 1 Year	Nematicide	cotton	peanut	cotton	peanut	cotton	peanut
4	Peanut 1 Year	No Nematicide	cotton	peanut	cotton	peanut	cotton	peanut
5	Soybean 1 Year	Nematicide	cotton	soybean	cotton	soybean	cotton	soybean
6	Soybean 1 Year	No Nematicide	cotton	soybean	cotton	soybean	cotton	soybean
7	Corn 2 Year	Nematicide	corn	corn	cotton	corn	corn	cotton
8	Corn 2 Year	No Nematicide	corn	corn	cotton	corn	corn	cotton
9	Peanut 2 Year	Nematicide	peanut	peanut	cotton	peanut	peanut	cotton
10	Peanut 2 Year	No Nematicide	peanut	peanut	cotton	peanut	peanut	cotton
11	Soybean 2 Year	Nematicide	soybean	soybean	cotton	soybean	soybean	cotton
12	Soybean 2 Year	No Nematicide	soybean	soybean	cotton	soybean	soybean	cotton
13	Continuous Cotton	Nematicide	cotton	cottonN[2]	cotton	cotton	cotton	cotton
14	Continuous Cotton	No Nematicide	cotton	cottonN	cotton	cotton	cotton	cotton
15	Corn 1 Year	Nematicide	corn	cottonN	corn	cotton	corn	cotton
16	Corn 1 Year	No Nematicide	corn	cottonN	corn	cotton	corn	cotton
17	Peanut 1 Year	Nematicide	peanut	cottonN	peanut	cotton	peanut	cotton
18	Peanut 1 Year	No Nematicide	peanut	cottonN	peanut	cotton	peanut	cotton
19	Soybean 1 Year	Nematicide	soybean	cottonN	soybean	cotton	soybean	cotton
20	Soybean 1 Year	No Nematicide	soybean	cottonN	soybean	cotton	soybean	cotton
21	Corn 2 Year	Nematicide	cotton	corn	corn	cotton	corn	corn
22	Corn 2 Year	No Nematicide	cotton	corn	corn	cotton	corn	corn
23	Peanut 2 Year	Nematicide	cotton	peanut	peanut	cotton	peanut	peanut
24	Peanut 2 Year	No Nematicide	cotton	peanut	peanut	cotton	peanut	peanut
25	Soybean 2 Year	Nematicide	cotton	soybean	soybean	cotton	soybean	soybean
26	Soybean 2 Year	No Nematicide	cotton	soybean	soybean	cotton	soybean	soybean
27	Corn 3 Year	Nematicide	cotton	corn	corn	corn	cotton	corn
28	Corn 3 Year	No Nematicide	cotton	corn	corn	corn	cotton	corn
29	Peanut 3 Year	Nematicide	cotton	peanut	peanut	peanut	cotton	peanut
30	Peanut 3 Year	No Nematicide	cotton	peanut	peanut	peanut	cotton	peanut
31	Soybean 3 Year	Nematicide	cotton	soybean	soybean	soybean	cotton	soybean
32	Soybean 3 Year	No Nematicide	cotton	soybean	soybean	soybean	cotton	soybean

Table 2. Impact of Nematicide on Cotton Yield, 2006

Treatment	April 13	Nov. 13	Seed cotton
	——reniform/100 cc——		*lb/ac*
Telone II	735	1090	1739
Untreated	724	1523	1540
LSD (.05)	**353**	**803**	**112**
Prob (F)	**0.858**	**.009**	**.0013**

Table 3. Effect of Non-Host Crops on Cotton Yield, 2006

	2005 Crop	2006 Crop	Seed cotton *lb/ac*
1	Peanut	Cotton	1753
2	Corn	Cotton	1734
3	Soybean	Cotton	1522
4	Cotton	Cotton	1550
	LSD (.05)		**158**
	Prob (F)		**.0086**

Table 4. Impact of Crop Rotation and Nematicide on Cotton Yield, 2006

	2005 Crop	2006 Crop	Seed cotton *lb/ac*
1	Peanut	Cotton + Nematicide	1838 a
2	Corn	Cotton + Nematicide	1766 ab
3	Soybean	Cotton + Nematicide	1619 abc
4	Cotton + Nematicide	Cotton + Nematicide	1733 ab
5	Cotton	Cotton	1366 c
6	Peanut	Cotton	1668 abc
7	Corn	Cotton	1702 ab
8	Soybean	Cotton	1424 bc

Table 5. Impact of Summer Non-Host Crop Rotation and Cotton on Reniform Nematode Populations, 2006

	2005 Crop	2006 Crop	April 13	Nov. 13
			——reniform/100 cc——	
1	Cotton	Corn	1086	367
2	Cotton	Peanut	1081	383
3	Cotton	Soybean	528	315
4	Corn	Corn	444	74
5	Peanut	Peanut	318	95
6	Soybean	Soybean	830	234
7	Cotton	Cotton	1140	3450
8	Corn	Cotton	753	2592
9	Peanut	Cotton	257	2321
10	Soybean	Cotton	856	3235
	LSD (.05)		**418**	**1004**

EFFECTS OF TILLAGE, POULTRY LITTER, AND NEMATICIDES ON COTTON YIELDS

C. H. Burmester and K. S. Lawrence

This test was developed to investigate differences in reniform nematode control by varying tillage, fertilizer sources, and nematicides in a cotton production system. Tillage included no-tillage, con-tillage (surface tillage with a field cultivator followed by a do-all), and strip tillage (6 to 8 inches in row with a Red Ball strip till). Fertilizer sources were commercial N, P_2O_5 and K_2O fertilizer (inorganic) or a 2-ton per acre rate of poultry litter (organic). Nematicide treatments included Temik (5 pounds per acre) applied in-furrow or Avicta applied to the seed. The Telone nematicide treatment was applied with the Red Ball strip tillage equipment.

Equal rates of fertilizer N, P_2O_5 and K_2O were applied whether commercial fertilizer or poultry liter was used as the fertilizer source. Telone II was applied at a rate of 3 gallons per acre on March 28. The cotton variety DPL 444 BG/RR was planted on May 9.

Reniform nematode levels were reduced by the Telone II treatment at planting (see table). Later sampling indicated very little difference in reniform nematode levels due to treatments. Spring tillage had no effect on reniform nematode levels. Differences in cotton yields were small with the exception of treatment 9. The highest seed-cotton yields (2,613 pounds per acre) was produced in the Telone II plus poultry litter treatment. This treatment averaged nearly 400 pounds per acre more than the average of the other nine treatments. The variability of this year's results makes firm conclusions difficult. Further study on the long-term effects of these treatments will be continued in 2007.

EFFECT OF FERTILIZER SOURCE, TILLAGE, AND NEMATICIDES ON RENIFORM NEMATODE CONTROL AND SEED COTTON YIELDS, 2006

Treatment number	Nematicide	Fertilizer	Tillage	Reniform (avg/150 cc soil) May 16	Jun.13	Aug. 1	Oct. 5	Seed cotton lb/ac
1	Temik	Organic	No-till	1680	2047	1448	541	2157
2	Temik	Inorganic	No-till	2878	3998	1738	1217	2218
3	Avicta	Organic	No-till	2936	3122	1487	637	2114
4	Avicta	Inorganic	No-till	2530	2858	599	792	2111
5	Temik	Organic	Con-till	1835	2453	1062	772	2327
6	Temik	Inorganic	Con-till	4152	1835	985	946	2275
7	Avicta	Organic	Con-till	3554	3225	1700	270	2311
8	Avicta	Inorganic	Con-till	1989	2761	1893	869	2086
9	Telone	Organic	Strip	1178	1822	1178	830	2613
10	Telone	Inorganic	Strip	1429	2395	2086	811	2368

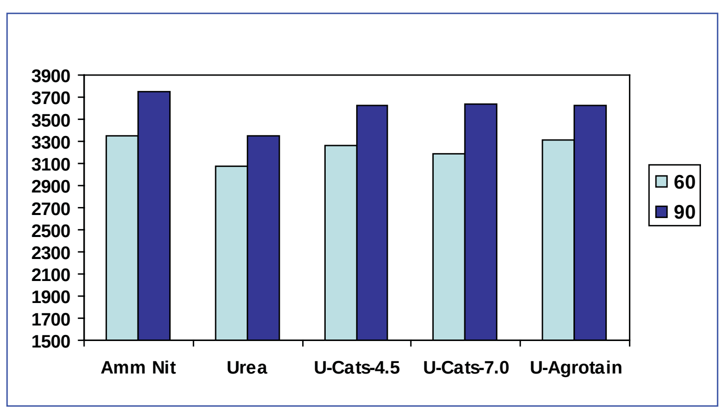
EFFECTS OF NITROGEN FERTILIZER SOURCES ON COTTON YIELDS IN A CONSERVATION TILLAGE SYSTEM

C. H. Burmester

Increasing costs for ammonium nitrate (AN) fertilizer has cotton producers exploring other sources of nitrogen (N) fertilizer. Some of these sources include urea fertilizers. With a growing use of conservation tillage there is concern about ammonia (NH_3) volatilization from urea fertilizer when placed on high residue soils. Agrotain is a urease inhibitor that is currently marketed to reduce N loss with surface-applied urea. Companies are also experimenting with other products to add to urea to reduce N loss. One such product is calcium thiosulfate (CaTs).

In 2006, a test of nitrogen fertilizers was initiated at the Tennessee Valley Research and Extension Center located in north Alabama. The test area was planted into a wheat cover crop that was terminated 26 days before planting. The soil type was a Decatur silt loam and 24 pounds of N fertilizer was applied preplant along with P and K fertilizers according to soil test recommendation. The cotton variety DP 454 BG/RR was planted on April 24 into a thick wheat residue. Wet, cold conditions stunted early cotton growth after emergence and resulted in cotton growing slowly most of May. Granular N fertilizers were applied on June 5 using N rates of 60 and 90 pounds per acre. No rainfall occurred for seven days following application. Fertilizer sources tested included (1) ammonium nitrate, (2) urea, (3) urea plus Agrotain (1 gallon per ton), (4) urea plus 4.5 percent calcium thiosulfate, and (5) urea plus 7.0 percent calcium thiosulfate.

With irrigation cotton yields were excellent. Lint cotton yields ranged from 1200 to 1500 pounds per acre in the test. Results of this study indicate that increasing N rates from 60 to 90 pounds per acre increased cotton leaf N and yields with all N sources (see figure). Slightly higher cotton yields were produced with AN, but they were not significantly different from yields produced using urea plus Agrotain or urea plus CaTs. Both concentrations of CaTs fertilizers produced similar yields. Ammonium nitrate did produce significantly higher cotton yields than urea alone at both N rates. Urea plus Agrotain and urea plus



Seed cotton yield, pounds per acre

CaTs produced significantly higher cotton yields than urea alone at the 90 pounds per acre rate of N fertilizer. No differences in cotton quality were found due to N fertilizer source or rate. These data support previous research on the use of Agrotain to reduce N loss on surface applied urea. The addition of the CaTs concentrations to urea also appears to show promise in reducing N loss in a high residue conservation tillage system.

MORE RECORD COTTON YIELDS ON THE OLD ROTATION, 2006

C. C. Mitchell, D. P. Delaney, and K. S. Balkcom

The Old Rotation (circa 1896) is the oldest, continuous cotton experiment in the world. Its 13 plots on 1 acre of land on the campus of Auburn University continue to document the long-term effects of crop rotations with and without winter legumes (crimson clover) as a source of nitrogen for cotton, corn, soybean, and wheat.

In spite of a severe drought throughout most of Alabama in 2006, crops on the Old Rotation experiment continued a trend that began in 1996 when the experiment changed from conventional tillage to conservation tillage. Another record cotton yield of 1760 pounds of lint per acre was produced on the non-irrigated half of the treatment following corn and crimson clover cover crop plus 120 pound N per acre. This surpassed 2005's record cotton yield of 1660 pounds of lint per acre on the same treatment. Interestingly, the irrigated half produced larger plants in 2006 but only 1730 pounds of lint per acre (Table 1).

After 4 years of irrigated cotton yields compared to non-irrigated cotton yields on this experiment, we have yet to demonstrate any advantage to irrigating cotton at this location (Table 2). Irrigation experiments with cotton in the Tennessee Valley have repeatedly shown advantages to irrigated cotton. Explanations as to why irrigation on the Old Rotation has not been an advantage include (1) timely rainfall; (2) improved infiltration, soil water-holding capacity, and depth of rooting because of 10-years of conservation tillage; and (3) poor irrigation timing. Over 4 years, irrigated cotton yields were 101 percent of the non-irrigated yields. On the other hand, irrigated corn plots produced 125 percent of the non-irrigated plots and soybean produced 124 percent of the non-irrigated plots.

TABLE 1. CROP YIELDS ON THE OLD ROTATION, 2006

Plot/Description	Clover dry matter	Wheat	Corn Irr.	Corn Non-irr.	Cotton Irr.	Cotton Non-irr.	Soybean Irr.	Soybean non-irr.
	lb/ac	bu/ac	bu/ac		lint/ac		bu/ac	
1 no N/no legume	0				560	410		
2 winter legume	5710				1200	1240		
3 winter legume	6060				1330	1260		
4 cotton-corn	6400				1400	1650		
5 cotton-corn + N	6710				1730	1760		
6 no N/no legume	0				480	360		
7 cotton-corn	6270		62	54				
8 winter legume	5850				900	1400		
9 cotton-corn + N	7080		154	118				
10 3-year rotation	6880		103	74				
11 3-year rotation	0	66.8					66.1	48.3
12 3-year rotation	0				900	900		
13 Cont. cotton/no legume +N	0				1420	1260		

TABLE 2. EFFECT OF IRRIGATION ON MEAN CROP YIELDS, OLD ROTATION, 2003-2006

Treatment (plots)	Corn grain Irr.	Corn grain Non-irr.	Cotton lint Irr.	Cotton lint Non-irr.
	bu/ac		lb lint/ac	
No N/no legume (plots 1 & 6)	--	--	452 c	379 d
Legume N only (plot 8)	--	--	1013 b	1075 bc
120 lb. N/acre (plot 13)	--	--	1210 ab	1177 b
2-yr rotation, legume N only (plots 4&7)	66 c	56 c	1140 b	1210 b
2-yr rotation, +legume, + 120 lb N/acre (plots 5&9)	164 a	134 a	1420 a	1540 a
3-yr rotation, legume N only (plots 10, 11 , 12)	103 b	77 b	1100 b	870 c
Soybean yield (4-yr mean) on 3-yr rotation: irrigated=54.6 bu/ac; non-irrigated=44.1 bu/ac				

THE CULLARS ROTATION (CIRCA 1911 - 2006)

C. C. Mitchell, D. P. Delaney, and K. S. Balkcom

An historical marker was dedicated at the Cullars Rotation experiment on November 3, 2006. Text on the two sides of the marker is as follows:

The Cullars Rotation
(Established 1911)

The Cullars Rotation is the oldest, continuous soil fertility study in the South and the second oldest cotton study in the world. It was started in 1911 by the Alabama Agricultural Experiment Station on the farm of J.A. Cullars and John P. Alvis. In 1938, the "Alvis Field" was sold to Alabama Polytechnic Institute which became Auburn University in 1960. The experiment consists of 14 soil fertility variables in three blocks that are rotated with cotton followed by a winter legume, corn followed by wheat, and soybeans planted after wheat.

National Register of Historical Places, April 19, 2003

The Alvis Field and Cotton Rust

In the late 1800s, J.P. Alvis and J.A. Cullars farmed this property which later became known as the "Alvis Field." They allowed Prof. G.F. Atkinson, a biologist at the Agricultural and Mechanical College of Alabama, to use this site to study cotton rust, a disease that causes cotton plants to shed leaves early. Atkinson's research in 1890 led to the discovery that cotton rust was caused by a potassium deficiency. As a result, the Cullars Rotation was started in 1911. Today, potassium fertilizers are used on cotton throughout the South.

Auburn Heritage Association
and Historic Chattahoochee Commission

An all-time record cotton lint yield of 2050 pounds lint per acre was produced on the treatment that receives complete N-P-K fertilization (plot 3). This surpasses the previous record cotton yield of 1880 pounds lint per acre on this same plot in 2004. Good yields of wheat (54 bushels per acre) and corn (110 bushels per acre) were made on this treatment in spite of a drought throughout the rest of Alabama (see table). As in the Old Rotation, timely rainfall at this site and the long-term benefits of conservation tillage are given credit for high yields in a drought year.

While long-term trends seem to indicate higher yields on the well-fertilized plots, the plots with low levels of one or more nutrient or factor e.g., plot C (nothing), plot 2 (no P), plot 6 (no K), and plot 8 (no lime), continue a trend toward lower and lower yields. For example, plot C (nothing) produced very low yields of most crops until recently when we get nothing from this treatment. Yields on the no P, no K, and no lime plots are also decreasing.

2006 CULLARS ROTATION YIELDS

Plot	Description	Clover dry matter *lb/ac*	Wheat *bu/ac*	Corn Non-irr. *bu/ac*	Cotton Non-irr. *lint/ac*	Soybean Non-irr. *bu/ac*
A	no N/+legume	5560	20.3	43	1130	51.2
B	no N/no legume	0	24.6	11	1260	53.8
C	nothing	0	0	0	0	0
1	no legume	0	45.3	94	1820	48.5
2	no P	4740	14.9	50	215	11.6
3	complete	5580	53.3	110	2050	47.5
4	4/3 K	5060	46	85	1820	49.9
5	rock P	6230	47.6	96	1800	48.2
6	no K	3130	40.3	54	0	21.3
7	2/3 K	510	46.1	93	1650	50.3
8	no lime	0	0	25	0	0
9	no S	4580	41	102	1600	50.6
10	complete+ micros	6780	47.1	96	1830	54.0
11	1/3 K	2490	45.3	96	720	50.8

THE TWO YEAR ROTATION (CIRCA 1929)

C. C. Mitchell, D. P. Moore, and B. E. Norris

The two-year rotation experiment (17 fertility treatments replicated four times) was planted to cotton and soybean at the Tennessee Valley Research and Extension Center and cotton and peanuts at the Prattville Agricultural Research Unit. Both sites were planted no-till into a small grain residue. Due to the drought, both cotton lint yields and soybean yields were very low at the Tennessee Valley location. At Prattville, cotton yields have been compared for conventional tillage and no tillage for the past 4 years. Although cotton yields in 2006 were very low due to the drought, there were no differences in yields due to tillage for the fourth year. This was the second year that peanuts have been planted in rotation with cotton on the Prattville Research Unit in this test. Unfortunately, the drought resulted in a poor stand that was not harvested. The two-year rotation at Brewton has been fallow since 2000. At Sand Mountain, this experiment is planted to *Sericea lespedeza*. No yields were reported from the Wiregrass Research and Extension Center.

YIELDS ON THE TWO-YEAR ROTATION EXPERIMENT AT TENNESSEE VALLEY AND PRATTVILLE, 2006

			Tennessee Valley		Prattville		
	Treatment	$N-P_2O_5-K_2O$	Cotton lint	Soy-bean	Conv. cotton lint	No-till cotton lint	Peanuts
			lb/ac	bu/ac	lb/ac	lb/ac	lb/ac
1	Untreated	0-0-0	333	10.5	160	106	No yield due to drought in 2006
2	No sulfur	150-60-60	429	20.0	319	315	
3	Moderate P	90-30-60	436	18.9	523	455	
4	No lime, low pH	90-60-60	441	18.3	581	610	
5	Low Mg	90-60-60	362	16.6	281	348	
6	No K	90-60-0	89	19.7	73	34	
7	Low K	90-60-30	158	21.9	169	160	
8	+ micros	90-60-60	267	19.6	189	310	
9	No NPK, + lime	0-0-0	138	10.8	48	24	
10	High N	120-60-60	294	18.1	223	397	
11	Low N	30-60-60	324	16.4	450	378	
12	No P	90-0-60	280	12.5	411	363	
13	Moderate N	60-60-60	424	18.6	450	319	
14	NPK+lime	90-60-60	543	19.3	624	566	
15	High K	90-60-120	544	21.6	663	595	
16	No N	0-60-60	481	14.0	416	465	
17	Fertilized 1978-82 only	0-0-0	425	12.4	310	121	
					Mean=346	Mean=327	

THE RATES OF N-P-K EXPERIMENT (CIRCA 1954)

C. C. Mitchell, D. P. Moore, and B. E. Norris

The rates of N-P-K experiments at Tennessee Valley Research and Extension Center (TVREC), Prattville Agricultural Research Unit (PARU), and Wiregrass Research and Extension Center (WREC) were planted to cotton in 2006. This experiment contains 16 soil fertility treatments replicated four times. It is planted in *Serecia lespedeza* at Sand Mountain and Upper Coastal Plains. This experiment has been fallow at Brewton since 2000. The Wiregrass location has not been harvested for yield since 2004.

Cotton lint yields in 2006 at Tennessee Valley and Prattville were the lowest in the past 6 years because of the drought. Figures 1 and 2 illustrate how some of these long-term data are used. Growers demand assurances that current N recommendations are sufficient for high yields. These on-going experiments allow continual monitoring of N rate response. The three years 2003-2005 represent some of the highest cotton yields ever produced on this experiment at these two locations. Yield response to N rates changes depending upon the season as illustrated by the mean N response curve, the highest yielding year and the lowest yielding year. Recommended N rate is 90 pounds N per acre. Even in a high-yielding year, this rate produced near maximum yields. In a drought year such as 2006 when yield potential is low, N rate does not matter because N is not a limiting factor.

COTTON LINT YIELDS ON THE RATES OF N-P-K EXPERIMENT AT TENNESSEE VALLEY AND PRATTVILLE, 2006

	TVREC		PARU	
Variable lb/ac	Soil test	Lint yields lb/ac	Soil test	Lint yields lb/ac
N rates				
0	--	490	--	240
30	--	560	--	400
60	--	560	--	610
90	--	480	--	660
120	--	540	--	720
150	--	490	--	730
P rates [1]				
0	38 High	480	83 High	600
20	31 High	460	83 High	580
40	55 High	540	105 VH	690
60	65 VH	530	116 VH	534
100	113 VH	480	188 VH	660
K rates [2]				
0	166 Med	470	128 Med	290
20	184 Med	510	151 Med	430
40	276 High	590	194 High	640
60	239 High	550	223 High	600
80	237 High	530	244 High	720
100	358 High	480	375 VH	660
No lime	pH=5.7	640	pH=4.8	610
LSD P<0.05		**99**		**165**

[1] Rates of P_2O_5.
[2] Rates of K_20.

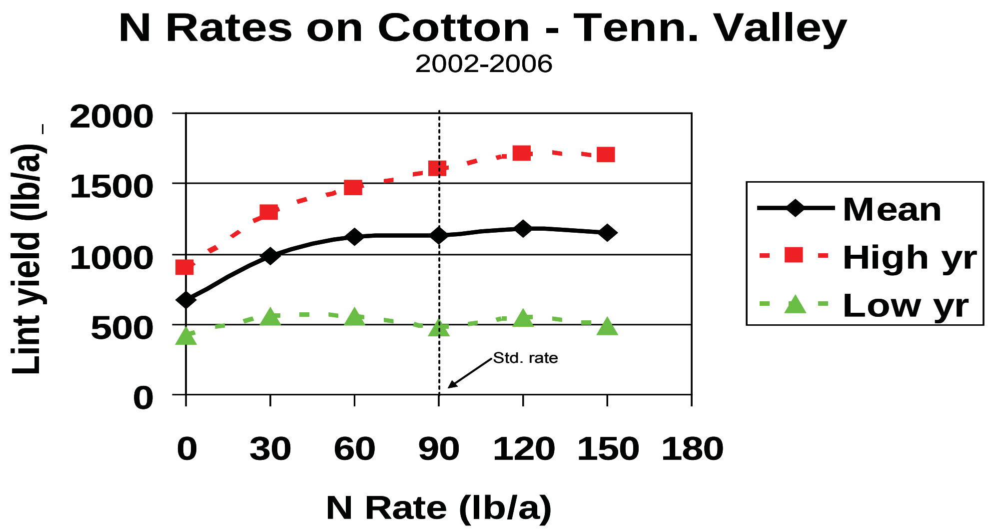


Figure 1 Nitrogen rates for non-irrigated cotton on the rates of N-P-K experiment at the Tennessee Valley Research and Extension Center, 2002-2006. High year was 2004 and low year was 2006.

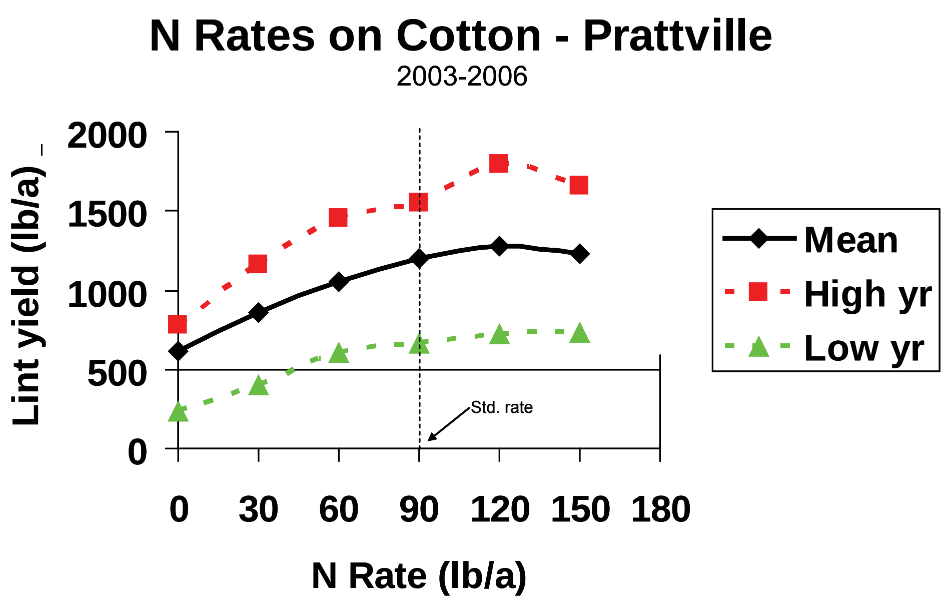


Figure 2. Nitrogen rates for non-irrigated cotton on the rates of N-P-K experiment at Prattville Agricultural Research Unit, 2003-2006. High year was 2003 and low year was 2006.

Fertilization of Cotton on Black Belt Soils

C. C. Mitchell, D. P. Delaney, R. P. Yates, G. Huluka, J. Holliman

This experiment was laid out in 2004 and was designed to complement the rates of N-P-K experiment (circa 1929) on other outlying units of the Alabama Agricultural Experiment Station. The purpose of this experiment was to identify optimum rates of N, P_2O_5, and K_2O for cotton on similar Black Belt soils by having a permanent site for soil fertility research at the Black Belt Research and Extension Center in Marion Junction, Alabama. The site is on an acid, Vaiden clay (very fine, montmorillonitic, thermic, Vertic Hapludalfs) and is the only soil fertility experiment in Alabama on Black Belt soils.

The experiment consists of six N rates, four P rates, five K rates, a no-lime treatment, and an unfertilized treatment replicated four times in a randomized block design. Because of disappointing yields in 2005 when cotton was planted no-till into a rye cover crop and excessive rainfall, the decision was made to switch to a ridge tillage system with no cover crop for 2006. Beds were made in November, 2005 and allowed to over-winter. Cotton was planted on April 14, 2006. Initial fertilizer treatments were applied on May 4. Due to dry weather, there were skips in the stand of cotton. Some areas had to be replanted on May 15. Side-dress N was applied on June 14.

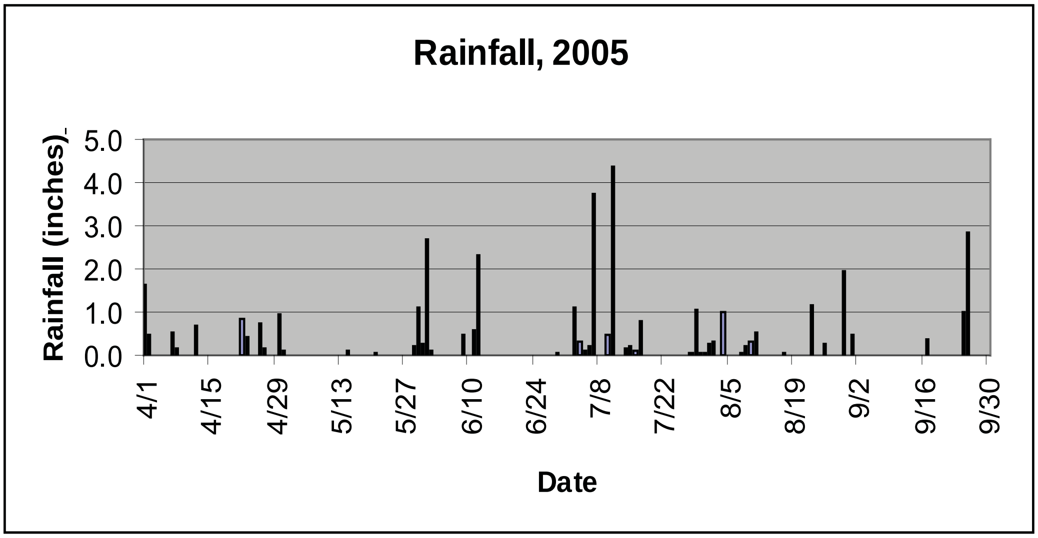
What has been described as the worst summer drought and highest temperatures in more than 50 years plagued this region of the state all summer long (see figure). By mid July, a few bolls were beginning to open. Plots were hand-picked on September 30.

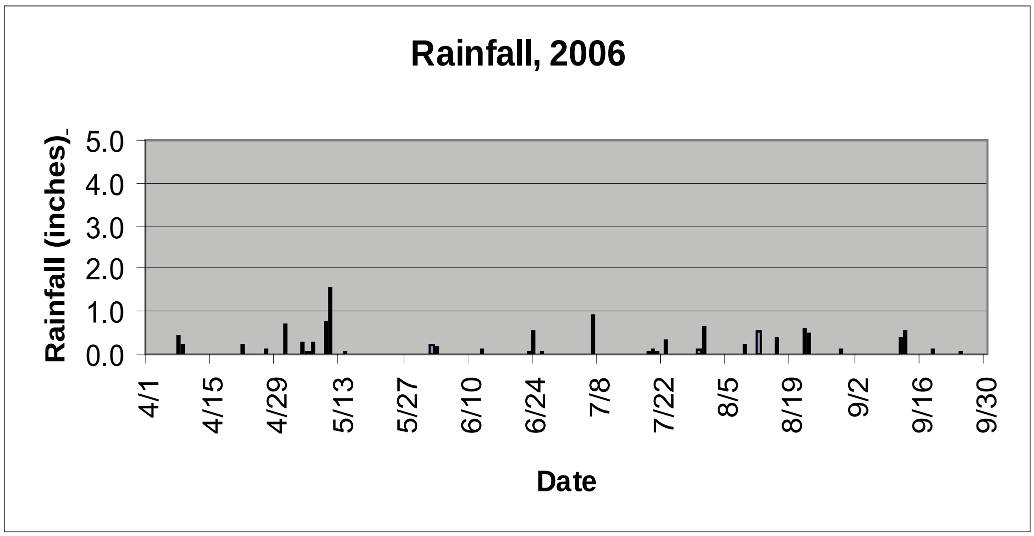
Although overall yields were slightly higher than 2005 yields, the drought-damaged crop failed to produce a decent crop of cotton at this site. Seeds were immature and hollow and the crop ginned 47.3 percent lint. However, if the crop had been machine harvested, very little of the lint would have been saved because of hard locks and weak bolls. There was not a significant difference in the treatments in 2006 at $P<0.1$. Cotton lint quality was measured on four different treatments by USDA-AMS Cotton Program Birmingham Classing Office. There were no differences in mean fiber quality: micronaire = 4.6, length/staple = 97/31, strength = 26.9, and uniformity = 81.9.

Two years with extreme weather conditions and very poor cotton yields at this site preclude any conclusions regarding soil fertility. Since these are the only established soil fertility variable plots on the Black Belt Research and Extension Center, we hope that they will be maintained indefinitely as is the rates of N-P-K experiment at six other Alabama locations. This experiment will be conducted with cotton again in 2007.

Fertilizer Treatments and Cotton Lint Yields on a Vaiden Clay in 2005 and 2006

Treatment number/ Description		—Rate of nutrients applied— N	P_2O_5	K_2O	2005 Lint yield	2006 Lint yield
		—lb/ac—				
			N rates			
1	No N	0	100	100	177	311
2	Low N	30	100	100	214	380
3	Intermediate N	60	100	100	265	403
5	Control	90	100	100	388	393
4	High N	120	100	100	237	400
6	No S/VH N	150	100	100	320	387
			P rates			
7	No P	90	0	100	280	378
8	Very low P	90	20	100	205	394
9	Low soil P	90	40	100	274	375
10	Intermediate P	90	60	100	233	388
5	Control	90	100	100	388	393
			K rates			
11	No K	90	100	0	157	353
12	Very low K	90	100	20	170	324
13	Low K	90	100	40	253	295
14	Intermediate K	90	100	60	341	335
15	High K	90	100	80	319	349
5	Control	90	100	100	388	393
			Other treatments			
16	No lime	90	100	100	196	413
17	Nothing	0	0	0	160	300
	LSD P<0.1				**135**	**NS**





Precipitation at Black Belt Research and Extension Center in 2005 and 2006

Cotton Systems Research: Evaluating Herbicide Technologies, Tillage Systems, and Row Spacings

K. S. Balkcom, A. J. Price, F. J. Arriaga, and D. P. Delaney

The objectives of this study were to evaluate the effects of two tillage systems, two row spacings, and three cotton varieties on yield, fiber quality, soil moisture, weed management, and economic returns. Cotton varieties, tillage systems, and row spacings were implemented in the fall of 2003 at the Field Crops Unit of the E.V. Smith Research and Extension Center near Shorter, Alabama. Treatments were arranged in a split-split-plot design with four replications. Cotton varieties were conventional cotton (FM966®), RoundUp Ready (FM960 RR®), and Liberty Link (FM966 LL®). Tillage systems consisted of either conventional tillage (fall chisel/disk, spring disk/level) with in-row subsoiling or no-tillage (fall paratilling). Row spacings were either 40-inch or 15-inch.

This experiment was conducted on a Compass sandy loam (coarse-loamy, siliceous, subactive, thermic Plinthic Paleudults). The experiment remained in the same location for 3 years with no re-randomization of the treatments. The experimental area utilized for this study contained conventional tillage and conservation tillage plots that were originally established more than 15 years ago. These plots allowed a comparison of treatments among mature tillage systems and eliminated any concern associated with transition effects into conservation tillage.

The experimental design contained a split-split plot treatment restriction in a randomized complete block design with four replicates. The main plots consisted of row spacings (15-inch vs. 40-inch row spacing), the subplots were varieties represented by different herbicide technologies (a conventional variety [FM966®], a glyphosate tolerant variety [FM960 RR®], ~~and~~ a glufosinate tolerant variety [FM966 LL®]), and the sub-subplots were tillage systems (conventional and conservation tillage). A rye cover crop was drilled across the experimental area each fall at 90 pounds per acre. With the exception of fall 2003, all plots were paratilled (complete disruption) immediately following the cover crop planting operation to eliminate any subsurface soil compaction. During the first year of the study, no deep tillage was performed in any of the plots, and only surface tillage associated with the conventional tillage plots was performed where appropriate. Surface tillage in the conventional tillage plots consisted of multiple spring disk operations and leveling. In the conservation tillage plots, no additional tillage was performed after the fall paratill operation. Typical spring in-row subsoiling prior to planting could not be administered to standard row (40-inch) cotton, because it would create a potential bias against 15-inch cotton.

In early spring, 20 to 30 pounds of N per acre, as NH_4NO_3, was applied to the cover crop to enhance biomass production. Biomass samples were collected from each plot approximately 3 weeks before anticipated planting date and immediately preceding chemical termination. The average biomass production across the experimental site was 3520, 3060, and 4470 pounds per acre for 2004, 2005, and 2006, respectively. All plots received 42 pounds of N per acre as a starter in the form of NH_4NO_3, prior to planting. An additional 60 pounds of N per acre was side dressed as urea-ammonium nitrate. All cotton varieties were treated with Cruiser® and planted with an in-furrow application of Temik® (5 pounds per acre) and Terraclor® (10 pounds per acre). All plots were planted on May 25, 2004, May 17, 2005, and May 17, 2006, respectively. The 15-inch cotton was planted with a precision drill at 105,000 plants per acre, while the 40-inch cotton utilized an air planter at 80,000 plants per acre. Prowl® (32 ounces per acre) was applied pre-emergence to all conventional tillage plots and conventional varieties immediately following planting. Two over-the-top applications of Roundup Weathermax® (23 ounces per acre), Ignite® (32 ounces per acre), and Staple® (1.2 ounces per acre) were applied to corresponding herbicide tolerant and conventional varieties at the two- and four-leaf stages. A layby application of Envoke® (0.15 ounce per acre) or Staple® (1.2 ounces per acre), depending on the year, was applied to all 15-inch cotton, while a layby application of Caparol® (32 ounces per acre), and MSMA® (42.6 ounces per acre) was applied on the same day to the 40-inch cotton. Each year, all cotton in the experiment was defoliated with Def 6® (1 pint per acre), Prep (1.5 pints per acre), and Dropp® (0.2 pound per acre). Unfortunately, access to a 15-inch spindle picker was not feasible, but cotton from two 2 meter square sections within each plot was hand-harvested on October 4, 2004, October 11, 2005, and October 11, 2006, respectively. A sub-sample of seed cotton from each plot was ginned in a 20-saw tabletop micro-gin to determine ginning percentage. Lint yields were determined by weighting lint and seed collected from each plot and multiplying corresponding seed cotton by the ginning percentage of each plot. The values obtained from a tabletop gin can be used for comparative purposes but may not necessarily coincide with values obtained by a grower from a full-scale gin. Values obtained for lint percentage and quality will likely be above typical averages, but any differences between treatments should be detectable. Initial plant populations were recorded approximately 3 weeks after planting by counting all the plants from three equal areas within each plot. Whole plant biomass (1 meter square) samples were collected from each plot during first square and mid-bloom.

Data were analyzed with rep, year, variety, spacing, tillage, and the interactions among year, variety, spacing, and tillage as fixed effects in the model, while replication X variety and replication X variety X spacing were considered random. Treatment differences were considered significant if $P \leq 0.05$.

Plant populations. A three-way interaction was observed between year X spacing X tillage (Figure 1). Higher plant populations were generally measured for the 15-inch cotton, regardless of the tillage system. Across the three significant conventional tillage comparisons and the one no-tillage comparison, 15-inch cotton plant populations were 22 percent higher than 40-inch cotton plant populations. However, due to differences between the drill for 15-inch cotton and traditional planter units utilized for 40-inch cotton, initial seeding rates were 35 percent higher for the 15-inch cotton. The high seed costs associated with using a drill in 15-inch cotton production will require a significant yield increase to offset this key production expense.

However, other cost savings, such as benefits associated with weed suppression, should also be considered.

Lint yields were influenced by year as indicated by three interactions that included year. A year X spacing interaction indicated that 2005 produced superior lint yields compared to the other two growing seasons (Figure 2A). However, within growing seasons, 15-inch cotton yields were equivalent to 40-inch cotton yields. The increase in seed costs associated with 15-inch cotton may require an additional yield increase for growers to justify the additional costs. A year X variety interaction also showed that 2005 produced the best yields, but the conventional and glyphosate-tolerant variety produced higher yields compared to the glufosinate-tolerant variety (Figure 2B). In 2005, conventional cotton produced 12 percent greater yields, while glyphosate-tolerant cotton produced 13 percent greater yields compared to glufosinate-tolerant cotton. In 2006, glyphosate-tolerant cotton was superior to both conventional and glufosinate-tolerant cotton by 29 percent. No lint yield differences were observed between varieties in 2004. A year X tillage interaction highlighted a 21 percent yield increase for conventional tillage cotton compared to no-tillage cotton during the 2004 growing season (Figure 2C). However, this yield increase can be attributed to the lack of deep tillage during the first year of the experiment. Typically, Coastal Plain soils require some form of deep tillage to eliminate subsurface soil compaction to enhance root growth and subsequent nutrient and water uptake.

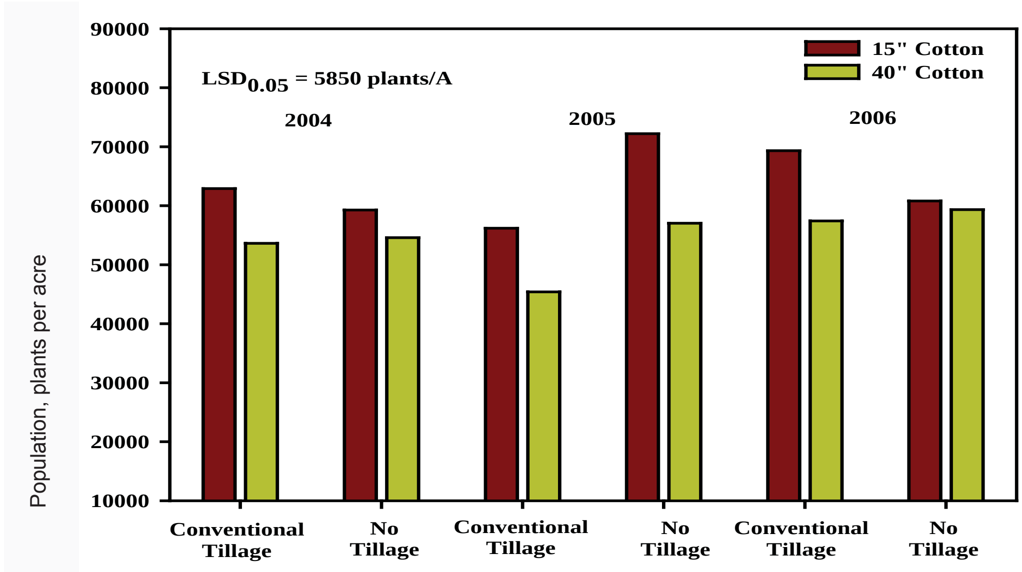


Figure 1. Plant populations measured across 15-inch and 40-inch cotton within conventional and no-tillage systems during the 2004-2006 growing seasons at the Field Crops Unit of the E.V. Smith Research Center near Shorter, Alabama

First square plant biomass. Three interactions were also observed for early season plant biomass measured at first square. A year X spacing interaction indicated that 15-inch cotton produced larger plants at first square the first two growing seasons; however, no difference was observed the last year (Figure 3A). The 15-inch cotton produced 51 percent and 17 percent heavier plants at first square compared to 40-inch cotton during 2004 and 2005, respectively. The 2004 40-inch cotton also produced less plant biomass than 40-inch cotton produced in 2005 or any 15-inch cotton produced in 2004 or 2005. A year X tillage interaction showed conflicting results that depended on the growing season (Figure 3B). In 2004, plant biomass measured at first square was lower from no-tillage plots, but as with the yields, that can be attributed to the lack of deep tillage. The biomass observed in the no-tillage plots for the 2004 growing season was also lower than plant biomass measured during the 2005 growing season. In 2005, the best growing season of the experiment, plant biomass was 16 percent greater in the no-tillage plots. In 2006, a very dry growing season, no differences were observed, but no-tillage plant biomass was numerically lower. A spacing X tillage interaction illustrated that 15-inch cotton produced 28 percent more first square plant biomass than 40-inch cotton averaged across tillage systems (Figure 3C). The 40-inch conventional tillage cotton also produced 20 percent greater first square plant biomass than 40-inch no-tillage cotton. This difference is probably attributed to the lack of deep tillage performed in 2004.

Mid-bloom plant biomass was significant across years, row spacings, and tillage systems. The most mid-bloom plant biomass was measured during the 2005 growing season followed by the 2004 growing season. The lowest mid-bloom plant biomass was recorded in the very dry 2006 growing season. The 2006 mid-bloom plant biomass was 55 percent and 78 percent lower than the 2004 and 2005 growing season, respectively. The 40-inch cotton produced 21 percent less plant biomass at

MID-BLOOM PLANT BIOMASS MEASURED ACROSS YEARS, ROW SPACINGS, AND TILLAGE SYSTEMS DURING THE 2004-2006 GROWING SEASONS AT THE FIELD CROPS UNIT OF THE E.V. SMITH RESEARCH CENTER, SHORTER, ALABAMA

	Crop year			Row spacing		Tillage system[1]	
Variable	2004	2005	2006	15”	40”	CT	NT
	lb/ac						
Mid-bloom plant biomass	3567	7233	1609	4534	3738	4408	3865
Pr > F		< 0.0001		0.0004		0.0007	
LSD(0.05)		**374**		**377**		**287**	

[1]CT = Conventional tillage; NT = No-tillage.

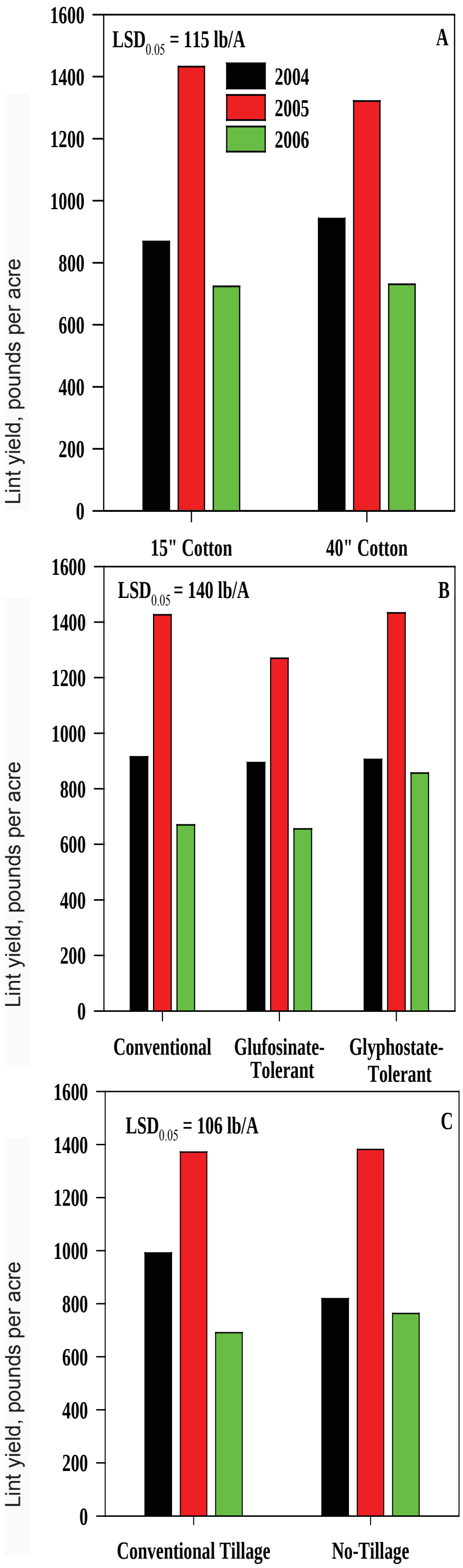


Figure 2. Lint yields measured during the 2004-2006 growing seasons across row spacings (A), cotton varieties (B), and tillage systems (C) at the Field Crops Unit of the E.V. Smith Research Center near Shorter, Alabama

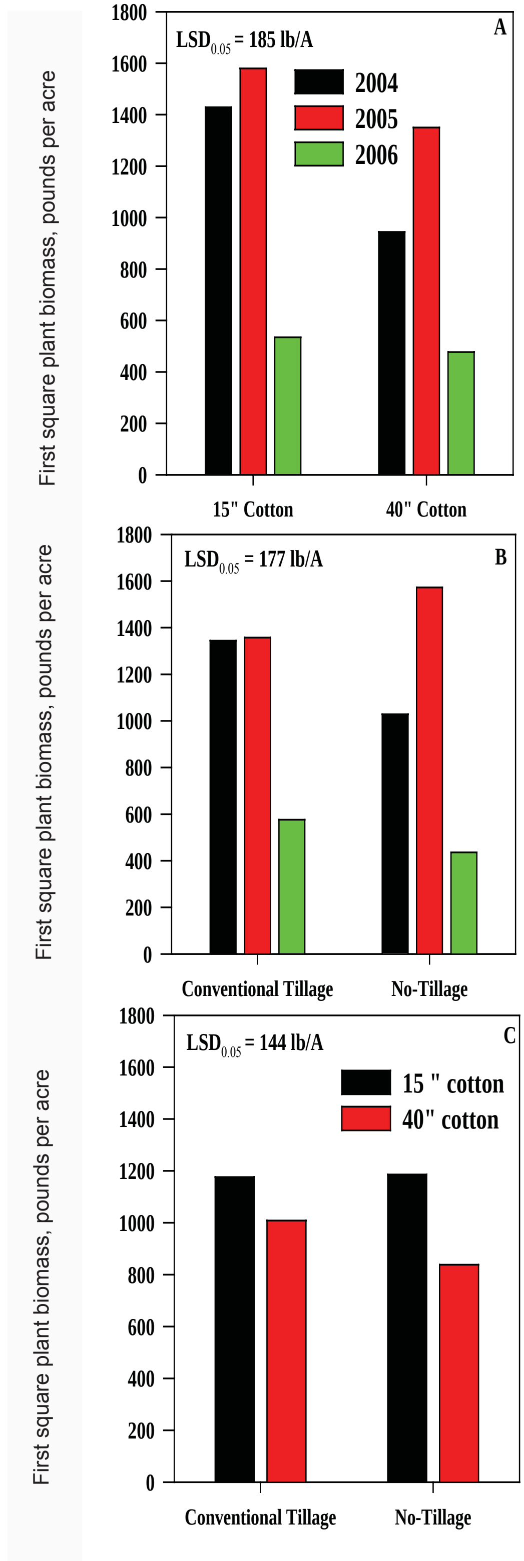


Figure 3. Plant biomass measured at first square during the 2004-2006 growing seasons across row spacings (A), tillage systems (B), and row spacings and tillage systems (C) at the Field Crops Unit of the E.V. Smith Research Center near Shorter, Alabama

mid-bloom compared to 15-inch cotton, while no-tillage plots produced 14 percent less plant biomass at mid-bloom when averaged over varieties, row spacings, and all 3 years of the experiment.

The effects of row spacing, cotton variety, and tillage system were examined across three growing seasons at the Field Crops Unit of the E.V. Smith Research Center near Shorter, Alabama. The variables examined included plant populations, lint yields, and plant biomass at first square and mid-bloom. Measured plant populations were generally greater for 15-inch cotton across tillage systems, reflecting a higher seeding rate utilized in the 15-inch cotton. Lint yields were influenced by the growing season more than row spacings, cotton varieties, or tillage systems. The growing season also influenced plant biomass at first square and mid-bloom, but 15-inch cotton generally produced more plant biomass, while tillage systems showed more erratic effects. Although 15-inch lint yields were equivalent to 40-inch cotton lint yields, an extensive economic analysis is required to account for differing plant populations, technology fees, tillage systems, and herbicide systems to determine if a 15-inch system is more profitable than a traditional cotton system with wider row spacings.

NITROGEN FERTILIZER SOURCE, RATES, AND TIMING FOR A COVER CROP AND SUBSEQUENT COTTON CROP

K. S. Balkcom, F. J. Arriaga, C. C. Mitchell, D. P. Delaney, and J. Bergtold

The objectives of this project were to (1) compare nitrogen fertilizer sources, rates, and time of application for a rye winter cover crop to determine optimal biomass production for conservation tillage production; (2) compare recommended and no additional nitrogen (N) fertilizer rates across different biomass levels for cotton; and (3) determine the effect of residual N applied to the cover crop across two N fertilizer rates for cotton.

Nitrogen sources, rates, and time of application were implemented at the Wiregrass Research and Extension Center (WREC) in Headland, Alabama. Biomass cover treatments were arranged in a split-split-plot design with four replications. At cotton planting, the eight row plots were split with one side receiving 90 pounds of N per acre at side dress and the other side receiving no additional N. Time of application was either fall or spring. Nitrogen source consisted of either commercial fertilizer applied at 0, 30, 60, or 90 pounds per acre or poultry litter applied at 0, 1, 2, or 3 tons per acre.

A rye cover crop was drilled across the experimental area on November 19, 2005 at the WREC. Rye was seeded at 90 pounds per acre. Plot size was 24 feet wide (eight 36-inch rows) and 40 feet long. Fall poultry litter treatments were applied on the same day the cover crop was planted. Commercial fertilizer was applied on December 12, 2005 after stand establishment. The spring applications of commercial fertilizer and poultry litter were applied on February 8, 2006. Poultry litter application rates were designed to approximate commercial fertilizer rates based on total and estimated available N supplied in the litter (Table 1). Biomass samples were collected on April 20, 2006 by collecting all aboveground plant biomass from two 2.7 square foot areas within each plot. Immediately prior to cotton planting, all plots were in-row subsoiled with a KMC Ripper Stripper® equipped with rubber pneumatic tires to minimize surface disruption. DPL 555® BG/RR was planted on May 15, 2006. The eight-row plots were split and corresponding cotton plots were side dressed on June 22, 2006 with 90 pounds N per acre, while other plots were not fertilized in order to estimate any residual effects from the poultry litter.

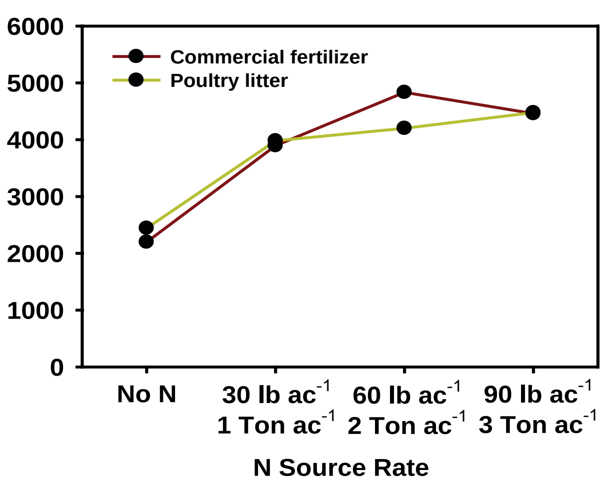
Rye biomass production. First year rye biomass results indicate that N fertilizer source or time of application had no effect on measured biomass levels. Rate was highly significant. There was no rate X source interaction, but the figure illustrates the corresponding biomass levels across N rates for the different sources. The figure shows that corresponding N rates between N sources produced very similar biomass levels and that source was not a factor during the first year. Biomass production was maximized at 60 pounds N per acre for commercial fertilizer and 2 tons poultry litter per acre. Although N timing was not significant, fall-applied N, regardless of source, produced 26 percent more biomass than spring-applied N.

Plant heights and whole plant biomass were collected from each plot on July 19, 2006. Plant heights were the average of 10 randomly selected plants within each plot. Whole plant biomass consisted of clipping the aboveground portion of all the plants within a 1-meter section of a non-harvest row

TABLE 1. TOTAL AND AVAILABLE N APPLIED IN THE FALL AND SPRING FROM POULTRY LITTER ON A DRY WEIGHT BASIS AT THE WIREGRASS RESEARCH AND EXTENSION CENTER, HEADLAND, ALABAMA, 2005-2006

Time of application	Total N, Rate (tons/ac) 0	1	2	3	Available N[1], Rate (tons/ac) 0	1	2	3
	lb/ac							
Fall	0	77	154	231	0	39	77	116
Spring	0	73	146	219	0	37	73	110

[1] Available N based on an estimate of 50 percent total N available during the first year of application.



Rye biomass production attributed to source and rate of application during the 2005-2006 winter growing season at the Wiregrass Research and Extension Center in Headland, Alabama

TABLE 2. PLANT HEIGHTS AND BIOMASS AT MID-BLOOM MEASURED ACROSS COVER CROP N RATES AND COTTON N RATES AT THE WIREGRASS RESEARCH AND EXTENSION CENTER, HEADLAND, ALABAMA, 2006

	Plant height *in*	Plant biomass *lb/ac*
Cover crop N rate		
No N applied	28.2	1693
1 ton acre	29.8	1899
2 tons acre	30.4	1718
3 tons acre	31.3	2128
30 lb acre	28.6	1743
60 lb acre	28.2	1467
90 lb acre	28.9	1555
LSD0.05	**1.6**	**365**
Cotton N rate		
0 lb acre	28.1	1569
90 lb acre	30.7	1917
LSD 0.05	**0.7**	**167**

from each plot. The plant material collected was dried at 55 degrees Celsius for 72 hours and weighed to estimate the plant biomass of each plot. The experimental area was defoliated with 1.5 pints per acre of Finish® on October 10, 2006. All plots were harvested with a spindle picker equipped with a bagging attachment on October 19, 2006. A sub-sample of seed cotton from each plot was ginned in a 20-saw tabletop micro-gin to determine ginning percentage. Lint yields were determined by weighting lint and seed collected from each plot and multiplying corresponding seed cotton by the ginning percentage of each plot. No fiber properties will be reported at this time.

Plant heights and biomass. The residual effects of poultry litter or commercial fertilizer for the cotton were estimated by applying no additional N or 90 pounds N per acre across the plots. Time of application or source of fertilizer had no effect on biomass levels; therefore, these variables were not accounted for in the analysis related to residual fertility. Rate applied to the cover crop was significant and served as the main plot, while the two N rates applied to cotton were used as subplots for the analyses of residual N. Both plant heights and plant biomass were measured at mid-bloom. No interactions existed between cover crop N rates and cotton N rates for either of these variables. The continuous mineralization of N from the poultry litter is evident across plant heights when values are compared to no N applied (Table 2). The highest rate of poultry litter produced the greatest plant biomass compared to no additional N or any of the commercial fertilizer rates. In some cases, the lower poultry litter rates produced greater plant biomass compared to commercial fertilizer. Most of the cover crop N rates required additional N to maximize plant heights and biomass at mid-bloom based on the response to 90 pounds N per acre applied to the cotton at side dress (Table 2).

Lint yields. Although not significant, there was a strong trend for an interaction between cover crop N rates and cotton N rates across lint yields. The addition of 90 pounds N per acre benefited the cotton crop, which was evident by the substantial increase in lint yields observed, regardless of the cover crop N rate (Table 3). It should be noted that lint yields presented represent 1 year and that the residual effects could become greater as the study continues. Interestingly, 3 tons of poultry litter per acre applied to the cover crop resulted in similar yields to 90 pounds N per acre at side dress with no N applied to the cover crop. Side-dress applications of N are usually preferred because N is applied at the time when cotton plants can readily take up the N, which minimizes potential losses. Poultry litter can be considered a slow release fertilizer that when applied in the fall benefits the cover crop and the cotton crop. Cover crop biomass is maximized and cotton N rates could at least be partially reduced. However, the combination of poultry litter and commercial fertilizer to maximize biomass production and cotton yields has been difficult to quantify. The continuation of this experiment will provide information related to the interactive effects of cover crop and cash crop fertilization.

TABLE 3. LINT YIELDS MEASURED ACROSS COVER CROP N RATES AND COTTON N RATES AT THE WIREGRASS RESEARCH AND EXTENSION CENTER, HEADLAND, ALABAMA, 2005-2006

	Cover crop N rate						
Cotton N	Poultry litter *(tons/ac)*				Commerclal N *(lb/ac)*		
rate	0	1	2	3	30	60	90
0	1141	1364	1363	1534	1178	1305	1413
90	1564	1659	1670	1674	1603	1578	1589

LSD 0.05 = 213

EFFECT OF NITROGEN AND PLANT GROWTH REGULATOR RATES ON COTTON YIELD AND FIBER QUALITY

K. S. Balkcom and C. D. Monks

The objective of this project was to determine the effect of two plant growth regulator (PGR) strategies (with and without a high application PGR rate) prior to harvest on cotton yield and fiber quality across two N rates for a cotton conservation tillage system. Nitrogen rates and PGR strategies were implemented at the Wiregrass Research and Extension Center (WREC) in Headland, Alabama, and the Field Crops Unit (FCU) of the E.V. Smith Research Center near Shorter, Alabama. Treatments were arranged in a split-plot design with four replications. Nitrogen rates consisted of either 90 pounds per acre or 120 pounds per acre. Plant growth regulator strategies were (1) no PGR; (2) low rate, multiple PGR applications according to label directions; (3) high rate, infrequent PGR applications according to label directions; (4) no PGR plus a late season PGR application; (5) low rate, multiple PGR applications plus a late season PGR application; and (6) high rate, infrequent PGR applications plus a late season PGR application.

An oat cover crop and a rye cover crop were drilled across the experimental areas in early November 2005 at the WREC and the FCU, respectively. Both were seeded at 90 pounds per acre. In early spring, 30 pounds of N per acre, as NH_4NO_3, were applied to the cover crop at both locations to enhance biomass production. Biomass samples were collected at each location approximately 3 weeks before anticipated cotton planting dates. Biomass productions averaged 3900 pounds per acre at WREC and 4800 pounds per acre at FCU. This difference in biomass production can be attributed to the different cover crop species and different termination dates. Immediately prior to cotton planting, all plots, at both locations, were in-row subsoiled with a KMC Ripper Stripper® equipped with rubber pneumatic tires to minimize surface disruption. DPL 455® BG/RR was planted on April 21, 2006 at WREC and DPL 555® BG/RR was planted on May 18, 2006 at the FCU. The experiment was abandoned at the FCU due to a very poor stand and subsequent extremely dry growing conditions.

Rates of PGR application (Mepex Ginout®) were selected based on the label directions and the growing conditions. Table 1 summarizes the total amounts of PGR applied, which ranged from 0 to 32 ounces per acre across the six PGR strategies examined at the WREC. The initial low rate, frequent application consisted of 4 ounces per acre per application, while the high rate, infrequent application consisted of 12 ounces per acre per application. The late season application consisted of a single 8 ounce per acre application.

Immediately prior to defoliation, plant heights, whole plant biomass, and final node counts were collected from each plot. Plant heights were the average of 10 randomly selected plants within each plot. The nodes on each of the 10 randomly selected plants were counted at the time of plant height measurement collection to estimate final node production. Whole plant biomass consisted of clipping the aboveground portion of all the plants within a 1-meter section of a non-harvest row from each plot. The plant material collected was dried at 55 degrees Celsius for 72 hours and weighed to estimate the plant biomass of each plot. The experimental area was defoliated with 1.5 pints per acre Finish® and 3 ounces per acre Ginstar® on September 12, 2006 and harvested with a spindle picker equipped with a bagging attachment. The seed cotton was collected from the two center rows of each 40-foot plot and weighed on September 20, 2006. A subsample of seed cotton from each plot was ginned in a 20-saw tabletop micro-gin to determine ginning percentage. Lint yields were determined by weighting lint and seed collected from each plot and multiplying corresponding seed cotton by the ginning percentage of each plot. The values obtained from a tabletop gin can be used for comparative purposes but may not necessarily coincide with values obtained by a grower from a full-scale gin. Values obtained for lint percentage and quality will likely be above typical averages, but any differences between treatments should be detectable. No fiber properties will be reported at this time.

Final plant heights, biomass, and nodes. Nitrogen rates had no effect on the observed plant heights; however, the PGR strategy did affect plant heights. No PGR or the late season application applied alone resulted in the tallest plants (Table 2). No difference in plant height was observed between the low and high PGR strategies or when the late season application was included. Nitrogen rates or PGR strategies had no effect on plant biomass at defoliation, while final node count was only influenced by PGR strategy (Table 3). The final node count was analogous to plant height with more nodes present when no PGR or the late season application was applied alone (Table 2).

Lint yields. An interaction was observed for lint yields between nitrogen rates and PGR strategies. The high PGR strategy that included a late season application produced the lowest yields regardless of N rate (see figure). However, lint yields measured from the other nitrogen and PGR strategies were similar to each other. Interestingly, cotton that received the recommended rate of 90 pounds N per acre with no PGR produced the highest lint yields. This observation along with similar yields observed between other nitrogen and PGR combinations may be attributed to the dry weather experienced during the 2006 growing season. The conditions experienced during the 2006 growing season indicate PGRs were not beneficial, regardless of application strategy.

TABLE 1. PLANT GROWTH REGULATOR (PGR) AMOUNTS AND APPLICATION TIMES ACROSS SIX PGR STRATEGIES AT THE WIREGRASS RESEARCH AND EXTENSION CENTER, HEADLAND, ALABAMA, 2006

Application time	None	Low	High	—Late season application— None	Low	High
			—lb/ac—			
60 DAP[1]		4			4	
70 DAP		4	12		4	12
80 DAP		4			4	
89 DAP		4	12		4	12
98 DAP				8	8	8
Total	0	16	24	8	24	32

[1] DAP = days after planting.

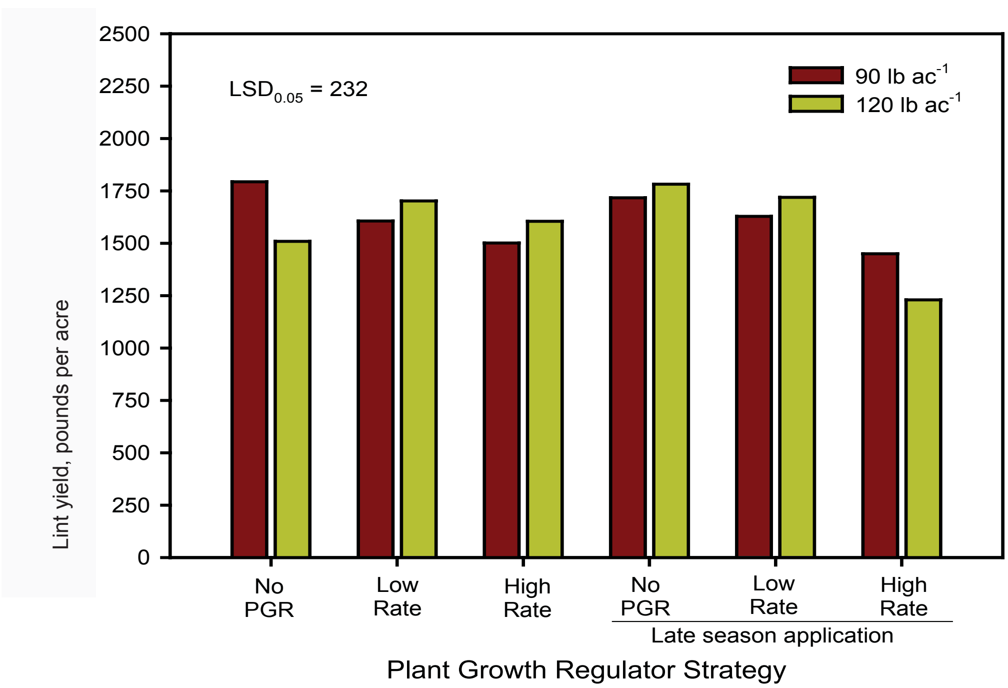
TABLE 2. PLANT HEIGHTS, BIOMASS AT DEFOLIATION, AND FINAL NODE COUNT ACROSS NITROGEN RATES AND PLANT GROWTH REGULATOR STRATEGIES AT THE WIREGRASS RESEARCH AND EXTENSION CENTER, HEADLAND, ALABAMA, 2005-2006

	Nitrogen rate(lb/ac)		Plant growth regulator strategies					
						–Late season application–		
	90	120	None	Low	High	None	Low	High
Plant height, inches	35.0	36.7	40.9	33.5	33.3	41.9	32.4	33.0
Biomass at defoliation, lb/ac	942	1028	980	937	971	1066	991	964
Final nodes, number	20.4	21.0	22.0	20.7	19.9	21.7	19.9	19.9

TABLE 3. LEAST SIGNIFICANT DIFFERENCE FOR PLANT HEIGHTS, BIOMASS AT DEFOLIATION, AND FINAL NODE COUNT ACROSS NITROGEN RATES AND PLANT GROWTH REGULATOR STRATEGIES AT THE WIREGRASS RESEARCH AND EXTENSION CENTER, HEADLAND, ALABAMA, 2006

	Plant height	Biomass	Final nodes
		Pr>F	
Nitrogen	NS[1]	NS	NS
PGR	2.8	NS	1.1
Nitrogen X PGR	NS	NS	NS

[1] Not significant at 0.05 level of probability.



Lint yields measured across nitrogen rates and plant growth regulator strategies at the Wiregrass Research and Extension Center in Headland, Alabama, during the 2006 growing season

EVALUATION OF VARIABLE-RATE SEEDING FOR COTTON

J. P. Fulton, S. H. Norwood, J. N. Shaw, M. H. Hall, C. H. Burmester, P. L. Mask, C. Brodbeck, and C. Dillard

The objective of this project was to evaluate opportunities for increased yield or profits through variable-rate (VR) seeding for cotton production. The cooperative farmer identified in 2005 allowed the on-farm study in Northern Alabama to continue during the 2006 growing season. This farmer utilizes a cotton and corn rotation and center pivot irrigation on a select portion of managed farmland. Irrigation permitted the comparison of irrigated and dryland cotton production. An irrigated and non-irrigated (dryland) field were selected to conduct this research. Selected seeding rates, for both the dryland and irrigated fields, included 35,000, 50,000, 65,000, and 80,000 seeds per acre. These seeding rates were established based on the farmer's traditional seeding rates for the chosen cotton varieties and recommendations from consultants from the respective seed company with additional rates selected above and below the traditional seeding rate.

A 24-row planter equipped with a VR drive system was used in this study. The planter was calibrated based on the manufacturer's operators manual. A plot within each field was blocked to provide four replications for the cotton treatments for this study. Treatments were then randomly assigned within each block with a single pass of the planter representing a specific population treatment within the block.

Subsequent to planting, stand counts were measured to determine actual germinated population. These were collected by measuring the number of plants for two adjacent rows over a 10-foot length. Stand count measurements were gathered on each 12-row section of the planter, with counts collected at three or more places along each 12 rows depending upon terrain variability. A cotton picker equipped with an AgLeader yield monitor was used to obtain spatial performance data for each plot. At harvest, seed cotton samples were also collected per plot and analyzed in the lab to assess quality for each treatment.

Analyses included summarizing stand counts along with spatially segregating yields based on the various seeding treatments to determine the effect of seeding rate on cotton yields. Quality data were also statistically analyzed to determine if differences existed between seeding treatments. All variables were analyzed using T-tests and least significant difference (LSD) tests at a significance level of 0.10.

Results showed that stand counts were all significantly lower, in both irrigated and non-irrigated fields than the targeted seeding rate with the exception of one treatment (35,000 seeds per acre within the non-irrigated plot). The seed populations being consistently lower than the target application rate may be tied to calibration and planter setup along with poor germination and emergence. The reason for the lower than expected actual populations is unknown at this time.

Statistically comparing the actual populations indicated that differences existed between the four average populations for each field (Tables 1 and 2). For example, the actual population of the 50,000 treatment was significantly different than the actual population of the 65,000 treatment. This result for each field was expected considering the differences between the seeding rate treatments.

In the non-irrigated field, there were no significant differences in lint yield between the four seeding rates (Table 1). These results reflect the same outcomes as in 2005 for the non-irrigated field. As stated above, there were significant differences in actual population between the four treatments. So, it is interesting that there were not significant differences between yields at these four seeding rates. For the irrigated plots, some differences in lint yield existed between the different seeding treatments (Table 2). The highest seeding rate (80,000) was significantly different than the 50,000 and the 65,000 treatments. However, there was not a significant difference in yield between the lowest seeding rate (35,000) and the three higher seeding rates.

As expected, irrigated cotton yields were significantly higher than dryland cotton yields. Irrigated yields were around 51 percent higher or more for the various treatments.

Cotton quality was analyzed for both the irrigated (Table 2) and non-irrigated (Table 1) fields at the four seeding rates.

TABLE 1. FIELD 1 SUMMARY FOR DRYLAND COTTON

Treatment *seeds/ac*	Actual [2] *seeds/ac*	Lint yield [1] *lb/ac*	Micronaire [2]	Color	Leaf grade [2]	Length [2] *in*	Strength [2] *gTex*	Uniformity [2] *pct*
35,000	33,251 d	660 c	4.83 a	75% 42s; 25% 41s	1.5 b	1.08 a	29.7 a	82.1 a
50,000	40,874 c	621 c	4.78 a	100% 41s	3.0 a	1.07 a	28.9 a	81.6 a
65,000	54,813 b	624 c	4.85 a	75% 41s; 25% 42s	2.5 a	1.08 a	29.2 a	81.6 a
80,000	62,944 a	645 c	4.78 a	75% 41s; 12.5% 42s; 12.5% 32s	2.4 a	1.08 a	29.1 a	81.4 a

[1] Mean lint yields with similar letters in each column indicate they are not statistically different at the 90 percent confidence level.
[2] Siimilar letters in this column indicate that means are not statistically different at the 90 percent confidence level.

TABLE 2. FIELD 2 SUMMARY FOR IRRIGATED COTTON

Treatment *seeds/ac*	Actual [2] *seeds/ac*	Lint yield [1] *lb/ac*	Micronaire [2]	Color	Leaf grade [2]	Length [2] *in*	Strength [2] *gTex*	Uniformity [2] *pct*
35,000	26,455 d	1383 ab	4.37 a	100% 31s	1.1 a	1.07 a	27.1 bc	81.9 b
50,000	37,679 c	1093 b	4.26 b	91% 31s; 9% 21s	1.3 a	1.09 a	27.0 c	82.0 ab
65,000	47,335 b	1171 b	4.29 b	91% 31s; 9% 21s	1.3 a	1.08 a	27.6 ab	82.5 a
80,000	52,199 a	1592 a	4.22 b	91% 31s; 9% 21s	1.3 a	1.08 a	27.9 a	82.0 ab

[1] Mean lint yields with similar letters in each column indicate they are not statistically different at the 90 percent confidence level.
[2] Similar letters in this column indicate means are not statistically different at the 90 percent confidence level.

Cotton quality features that were analyzed were micronaire, strength, leaf grade, uniformity, and length. Color was also reported but not compared. In the non-irrigated field, there were no significant differences between quality features at the varying seeding rates except for leaf grade. The leaf grade of the 50,000, 65,000, and 80,000 treatments were significantly higher than that of the 35,000 treatment.

The results for the irrigated field differed from the non-irrigated field. In the irrigated field, there were no significant differences between any of the treatments for the leaf grade and length variables. For micronaire, there was a significant difference between the lowest seeding rate (35,000) and the three higher seeding rates. Significant differences were found with strength, which increased with population. The only significant difference in uniformity was between the 35,000 and 65,000 rates. The quality assessment will be repeated again next year.

This concludes the second year of data collection and analysis. Future plans are to repeat and conclude this investigation during the 2007 growing season.

Evaluating Pressure Compensating Subsurface Drip Irrigation (SDI) for No-Till Row Crop Production on Rolling, Irregular Terrain

J. P. Fulton, M. P. Dougherty, J. N. Shaw, L. M. Curtis, C. H. Burmester, C. Brodbeck, D. H. Harkins, and B. Durham

This project was conducted on a 12-acre field at the Tennessee Valley Research and Extension Center (TVREC), Belle Mina, Alabama. The objectives of this project were to evaluate cotton production on rolling terrain irrigated with subsurface drip irrigation (SDI) in conjunction with cover crops and to evaluate spatial yield variability as related to SDI and topography. The experimental design was a randomized block design with two irrigation treatments—irrigated (Irr) and non-irrigated (No Irr)—and two cover crop treatments—cover (C) and no cover (NC)—with four replications (Table 1). The four treatments were replicated four times for a total of 16 plots.

Plots measured 480 feet by 1250 feet with SDI tape laid out in 1250 foot runs on 80-inch spacing and buried at an average depth of 13 inches. Plots receiving a cover crop treatment were planted with wheat at a rate of 90 pounds per acre on October 28, 2005. On April 18, 2006, cotton, variety DP 444 BR, was planted using 40-inch row spacing. Plots receiving irrigation were irrigated based on 60 percent pan during the 2006 growing season. The irrigated cover crop plots had a delay in starting irrigation for about 3 weeks. Yield and quality data were analyzed using LSD T-tests to determine if any significant differences existed between treatments.

Yield results from the four treatments had significant differences as illustrated in Figure 1 and in Table 1. There were, as was expected, significant differences between irrigated and non-irrigated plots yields. Figure 2 presents the yield map and shows

Table 1. Yield Averages per Treatment

Treatment	Yield seed cotton [1]
	lb/ac
Irrigated / Cover	2853 a
Irrigated / No Cover	2396 b
Non-Irrigated / Cover	1098 c
Non-Irrigated / No Cover	941 c

[1] Mean yields with similar letters indicate they are not statistically different at the 90 percent confidence level.

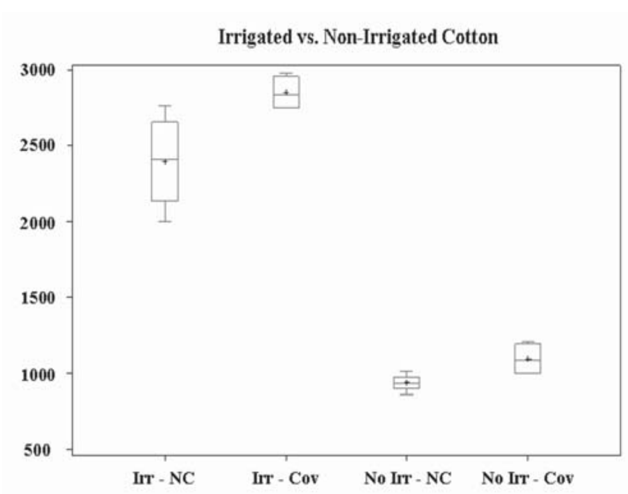


Figure 1. Boxplot of yield results by treatment combinations

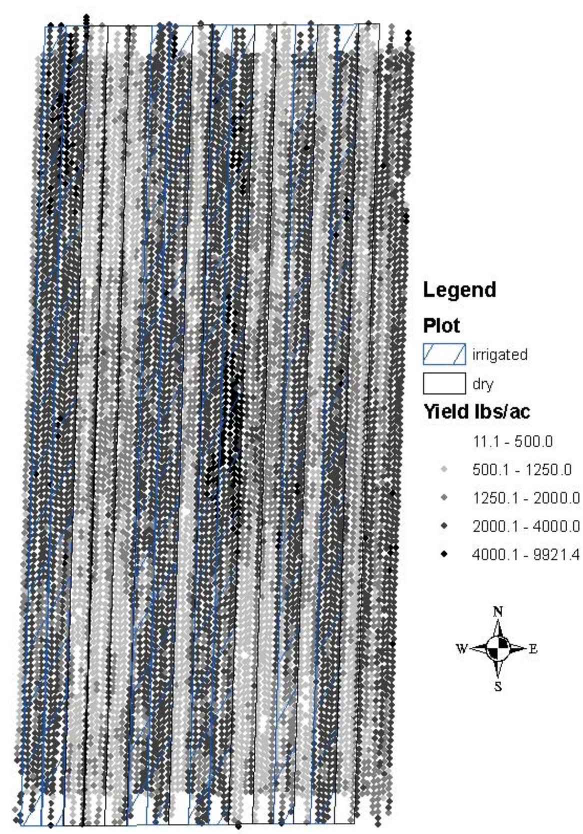


Figure 2. 2006 yield map outlined with irrigated vs. non-irrigated plots

yield variability within plots but also highlights the yield difference between irrigated and non-irrigated treatments. Yields on irrigated plots were as much as 61 percent higher than the yields measured on non-irrigated plots. There were also differences for the cover crop vs. no cover crop comparison, with those of the irrigated cotton having significantly higher yields. Yields for the plots receiving a cover crop treatment were as much as 19 percent higher than the plots without a cover crop. The trend appears to be that cover crops are providing yield benefits (Figure 1). This yield response could be a result of increased organic matter for the cover crop plots over the past 3 years, potentially providing increased soil water-holding capacity and reduced surface water evaporation. These results highlight the advantage of increased organic matter during drought conditions as was experienced in 2006.

A quality analysis was conducted by harvesting 50 cotton bolls collected at three locations within each plot (48 total samples; three locations X 16 plots). Quality factors considered were micronaire, strength, leaf grade, uniformity, and length. Differences existed between all quality features except for leaf grade (Table 2). For micronaire, the irrigated cover crop treatments were significantly higher than the other treatments. Irrigated plots had significantly higher lint strengths than on the non-irrigated plots. The non-irrigated plot with cover also had significantly higher lint strength than the non-irrigated plot without a cover crop. Lint uniformity was significantly higher on irrigated plots with a cover crop. Uniformity was also significantly higher for the plots with irrigation and no cover crop compared to both non-irrigated treatments. The lint length was significantly longer on all irrigated treatments than on the non-irrigated treatments.

Another result discovered during 2006 for this project was that using 60 percent of calculated pan evaporation (adjusted for percent canopy closure) for scheduling irrigation was not sufficient during drought conditions. Visual assessment of the cotton during the growing season showed less vegetation and boll development when compared to other ongoing irrigation studies at TVREC. Final yields between this project and the other studies also supported these in-season observations. Therefore, 60 percent pan did not supply sufficient water during irrigation events to maximize cotton yields for the dry growing conditions experiences in 2006. Based on these results, 90 percent has been selected for future use to schedule irrigation for this project.

In summary, irrigated treatments and cover crop treatments had significantly higher yields. For the quality data the difference that was noted repeatedly was that micronaire, lint strength, lint uniformity, and lint length were all significantly higher on irrigated plots than on non-irrigated plots. Remote-sensed thermal imagery was also collected during the 2006 growing season. Preliminary results indicated that high resolution thermal imagery may prove to be very useful in identifying in-season SDI issues and provide a management tool for SDI.

Table 2. Quality Averages per Treatment

Treatment	Micronaire [1]	Strength [2]	Uniformity [2]	Length [2]
		gTex	*pct*	*in*
Irrigated / Cover	4.4 a	28.5 a	83.5 a	1.1 a
Irrigated / No Cover	3.9 b	28.0 a	82.8 b	1.1 a
Non-Irrigated / Cover	4.1 b	26.1 b	81.8 c	1.0 b
Non-Irrigated / No Cover	4.1 b	25.2 c	81.2 c	1.0 b

[1] Values between 3.5 and 4.9 are not discounted at the gin.

[2] Mean yields with similar letters indicate they are not statistically different at the 90 percent confidence level.

Subsurface Drip Irrigation and Sprinkler Irrigation for Site-Specific, Precision Management of Cotton

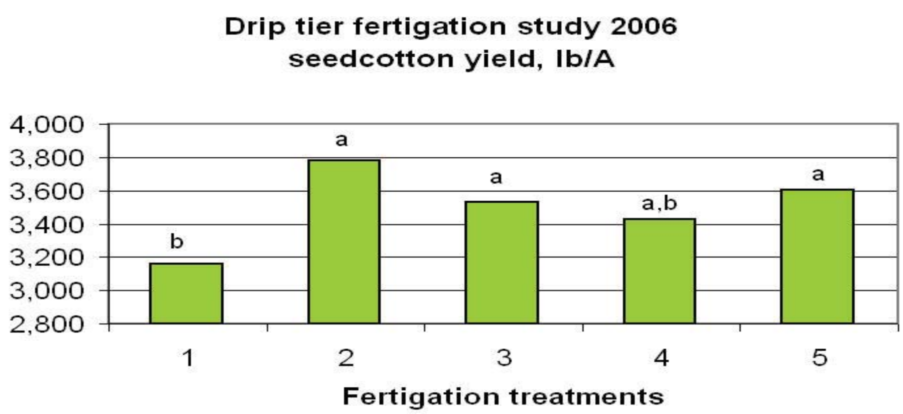
M. P. Dougherty, C. H. Burmester, J. P. Fulton, B. E. Norris, D. H. Harkins, L. M. Curtis, and C. D. Monks

A subsurface drip irrigation (SDI) study was installed at the Tennessee Valley Research and Extension Center (TVREC) in 2005 to evaluate four precision fertigation management scenarios. Approximately 7,500 feet of SDI tape and fertilizer injection equipment was installed on five treatments with four replications. Each plot was made up of eight 345-foot rows of cotton on 40-inch row spacing. Individual fertigation treatments are described in Table 1. First year results for 2006 are reported in Table 2 and Figures 1 and 2.

Table 1. Treatment Description, Fertigation Management Trials, 2006

Treatment [1]	Description
1 Control – drip irrigated, all fertilizers surface applied	**Preplant** N and K @ 60 pounds per acre. **Post-Plant** N (75lb/ac) side dressed at early square
2 Timing 1 – with surface preplant	**Preplant** 20 pounds of N and K (surface) **Drip** 40 pounds N,K –square to bloom (25 days) **Drip** 75 pounds N,K – bloom + 25 days
3 Drip timing 1	**Planting Drip** 20 pounds N,K **Drip** 40 pounds N,K –square to bloom (25 days) **Drip** 75 pounds N,K – bloom + 25 days
4 Drip timing 2	**Planting Drip** 20 pounds N,K **Drip** 40 pounds N,K square to bloom (25 days) **Drip** 75 pounds N,K – bloom + 40 days
5 Timing 2 – with surface preplant	**Preplant** 40 pounds of N and K (surface). **Drip** 95 pounds N,K –square through bloom (50 days)

[1] All treatments received 135 pounds per acre of nitrogen and potassium (K_2O), 20 pounds per acre of sulfur, and l pound per acre of boron. Phosphorus fertilizer was surface-applied to maintain P at high soil test levels. Drip fertilizer was 8-0-8-1.2S-0.06B made using 32 percent liquid N, potassium thiosulfate, fertilizer grade KCL, solubor, and water.



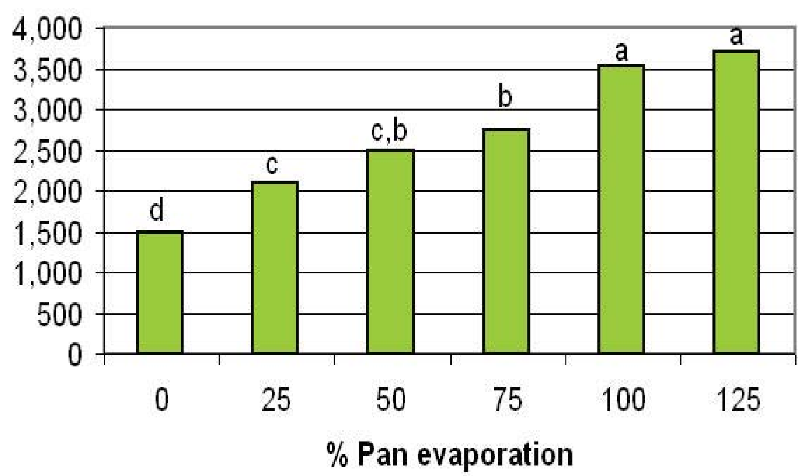


Figure 1 (top). Drip tier fertigation management study, lb/ac, 2006. Different subscripts denote statistical difference (α=0.05). N=4. Turnout = 41 percent
Figure 2 (bottom). Precision sprinkler irrigation cotton trials, lb/ac, 2006. Different subscripts denote statistical difference (α=0.05). N=4. Turnout = 38 percent

Cotton was harvested on October 10 and on October 24, 2006 and evaluated for yield, quality, and leaf nutrients. Results (Table 2 and Figure 1) indicate differences in cotton yield, quality, and leaf nutrients by treatment. Fertigated cotton yields were higher than the non-fertigated control (treatment 1). Higher yields were seen where fertigation was applied within 50 days of square (treatments 2, 3, and 5). Fertigation treatments 2 and 5, the two highest yielding treatments, received 20 and 40 pounds, respectively, of preplant surface nitrogen and potassium (K_2O). Fertigated cotton yields averaged 3.0 bales.

A new sprinkler study was also initiated in 2006 on a randomized block design of 48 plots at TVREC to test the soil and plant response of cotton grown using six irrigation treatments ranging from 0 percent (non-irrigated) to 125 percent of calculated pan evaporation, adjusted for percent canopy cover.

The 2006 growing season was one of the three driest years in the past 9 years at TVREC, with only 6.63 inches of rainfall falling during the growing season and a calculated pan evaporation of over 23 inches. Results from four replications (Figure 2) provide clearly defined benchmark yields for future precision agriculture research on the thermal response of soil and plant material to various irrigation scheduling treatments throughout the growing season. Precision yield monitoring provided spatial monitoring of yield results for both the SDI and sprinkler studies. Sprinkler-irrigated cotton yields averaged 2.2 bales.

Table 2. Seed Cotton Yield and Lint Quality of Cotton Fertigation Management Trials, 2006

Treatment [1]	Yield	Lint				Leaf nutrients				
		Mic	Length	Strength	Uniformity	N	Ca	K	Mg	P
	lbs/ac					*pct*	*pct*	*pct*	*pct*	*pct*
1	3160 b	4.83 a	1.13 b,c	31.1 a	84.3 a	3.88 a	2.06 a	1.48 a	0.35 a	0.28 b
2	3780 a	4.63 b	1.15 a,c	30.8 a	84.4 a	3.92 a	2.01 a,b	1.45 a	0.32 b	0.29 a,b
3	3528 a	4.60 b	1.12 b,d	30.6 a	84.2 a	3.62 a	1.86 b	1.28 b	0.32 b	0.24 c
4	3430 a,b	4.65 a,b	1.13 b,c	30.1 a	83.8 a	3.59 a	2.07 a	1.44 a	0.31 b	0.30 a,b
5	3606 a	4.58 b	1.13 b,c	30.2 a	83.9 a	3.80 a	1.87 b	1.31 b	0.32 b	0.26 b

[1] (1) Surface applied N-P-K with drip irrigation (control). (2) Preplant 20 pounds N-K surface with 2 N-K drip timings. (3) 20 pounds N-K drip at planting with 2 N-K drip timings (to 25 days after bloom). (4) 20 pounds N-K at planting with 2 N-K drip timings (to 40 days after bloom). (5) Preplant 40 pounds N-K surface with 1 N-K drip timing. Different subscripts denote statistical difference (α=0.05). N=4. Turnout = 41 percent.

HERBICIDES

Evaluation of Herbicides for Palmer Amaranth Control in Cotton, Headland, Alabama, 2006

M. G. Patterson

Cotton, variety DPL 143 B2RF, was planted at the Wiregrass Research and Extension Center in early May 2006 in a field that was heavily infested with palmer amaranth *(Amaranthus palmeri)*. Although there are biotypes of this weed that are resistant to the ALS class of herbicides (Staple, Envoke, Cadre, Classic, etc.), and to glyphosate (Roundup, etc.), the population at Headland has not shown resistance.

Several soil-applied and foliar-applied herbicides were evaluated for activity on this site. The trial site has been maintained in reduced tillage for the past 20 years. A strip till planting system was used and all production practices including soil fertility and disease and insect control were maintained by Research Center personnel for optimum cotton production. One treatment containing trifluralin (Treflan) was applied and incorporated prior to planting using a disk harrow. The site was irrigated several times during the growing season using a lateral move irrigation system. In addition to the herbicides applied (see table), the entire trial site including the untreated control was oversprayed with Roundup Weathermax at the rate of 32 fluid ounces per acre in early August after all weed control evaluations were obtained.

Palmer amaranth control from Treflan at 1.5 pints per acre was highest approximately 1 month after application (June 7) at 78 percent. Other soil-applied treatments including Prowl H20 at 2 pints per acre, Cotoran at 2 pints, Linex at 2.5 pints, Envoke at 0.1 ounce, and Reflex at 0.5 pint provided 75, 45, 73, 83, and 57 percent control, respectively. Foliar treatments applied at the four-leaf cotton stage to pigweed about 12 inches tall provided 53 to 85 percent early season control. Roundup plus metolachlor (Dual, etc.) and Roundup plus alachlor (Intrro) provided fair early season control, but also continued to provide control for an additional 2 to 3 weeks.

The most effective treatments in the study were mixtures of Envoke plus Touchdown applied over-the-top when cotton was in the seven-leaf stage. A premix of these two herbicides under the code name A15292 provided greater than 90 percent control 2 weeks (June 21) after application. These treatments continued to provide good control approximately 6 weeks (July 18) after application, resulting in some of the highest yields in the study.

The results of this study clearly show that postemergence control is needed to control palmer amaranth and obtain optimum cotton yields. In light of the development of herbicide-resistant pigweed in Georgia, a logical approach would be to integrate both soil-applied and foliar herbicide programs using different modes of action to try and maintain season long control. Prowl PRE followed by Roundup plus metholachlor early postemergence followed by the premix of A15292 followed by a layby herbicide application would be such a program.

Comparison of Herbicides for Control of Palmer Amaranth in Cotton

Treatment [1]	Rate	Timing	Percent control			Seed cotton
	no/ac		*June 7*	*June 21*	*July 18*	*no/ac*
Treflan	1.5 pt	PPI	78	38	7	242
Prowl	2 pt	PRE	75	50	17	0
Cotoran	2 pt	PRE	45	10	0	532
Linex	2.5 pt	PRE	73	25	0	0
Reflex	0.5 pt	PRE	57	60	3	0
Roundup +	18 oz	4 LF	64	74	50	2315
Metolachlor	1 pt					
Roundup +	18 oz	4 LF	85	82	67	2614
Alachlor	2 pt					
A15292	24 oz	7 LF	---	93	77	3824
A15292	36 oz	7 LF	---	95	80	3904
Untreated	-----	-----	0	0	0	0

[1]Treatments applied in 15 gallons of water per acre with flat fan nozzles.

Comparison of Roundup Ready, Liberty-Link, and Conventional Varieties in Tilled and Reduced Till Systems

M. G. Patterson

A comparison of Roundup Ready (RR), Liberty-Link (LL), and conventional variety (CV) cotton grown in conventional till and reduced till systems was conducted in north (Belle Mina) and south (Headland) Alabama during 2005 and 2006.

Data analysis revealed no yield differences or economic differences between herbicide/tillage systems at Belle Mina in either year. There was a decrease in late season broadleaf weed control for conventional tilled systems compared to no-till at Belle Mina during 2006 (93 vs. 84 percent).

Yield differences were found between strip till (1576 pounds per acre) and conventional till (1425 pounds per acre) and between RR (1564 pounds per acre), LL (1461 pounds per acre), and CV (1326 pounds per acre) varieties in both years at Headland. Annual grass and broadleaf weed control was lower for conventional (85 and 89 percent) than for either RR (95 and 94 percent) or LL (94 and 89 percent) systems.

Economically there were minimal differences between costs of herbicide/tillage systems at Headland. However, the strip till system returned approximately $75.00 per acre more than the conventional tillage system. Also, RR and LL systems returned $108.00 and $71.00 per acre more, respectively, than the conventional herbicide system.

The implication of this data for south Alabama cotton growers, in light of the recent discovery of glyphosate and ALS herbicide-resistant pigweed in Georgia, is a probable reduction in economic return if they change back to producing cotton with conventional tillage using conventional herbicide technology. More than 90 percent of Alabama cotton growers currently use RR varieties and an estimated 75 percent use some form of reduced tillage. The need for new cotton herbicide technology that has post-emergence activity on pigweed is evident.

Evaluation of a Two-Pass Herbicide System in Three High-Residue Rye Cover Conservation-Tillage Cotton Systems

A. J. Price, C. D. Monks, and M. G. Patterson

Three field studies were conducted evaluating Roundup Ready, Liberty Link, and conventional cotton varieties at E.V. Smith Research Center. The studies were a factorial treatment arrangement consisting of three levels: winter cover (rye present or absent), early postemergence alone or sequential (either Roundup™, Ignite™, or Envoke), and alone or followed by a Layby (Caparol™ plus MSMA). Valor™ or Prowl™ was additionally utilized preplant or preemergence in the conventional variety system. Rye was established in the fall of 2004 and 2005 in half the plots as winter cover preceding a cotton crop under a conservation tillage system (Figure 1).

In the spring, the winter cover and emerged weeds in fallow plots were terminated with a glyphosate application. Additionally, rye was rolled with a mechanical roller-crimper. Following within-row subsoiling in all years, cotton was established in four-row plots 25 feet in length with 40 inch row spacing. Each treatment was replicated four times.

Weed control. In the 2005 and 2006 Roundup™ system, southern crabgrass and Palmer amaranth were the most common weeds. The standard three-pass system (early postemergence, late postemergence, and layby) performed better than all other systems. Two-pass systems that included a layby performed better than systems that did not include a layby. In the 2005 and 2006 Ignite™ system, southern crabgrass, browntop millet, Palmer amaranth, and hemp sesbania were the most common weeds. Similar to the Roundup™ system a three-pass system performed better than all other systems, and two-pass systems that included a layby performed better than systems that did not include a layby. Ignite™ is weaker on larger grasses and pigweeds; hence, control declined in plots with delayed Ignite™ applications. In the 2005 and 2006 conventional system, southern crabgrass, coffee senna, and Palmer amaranth were the most common weeds. In general, when a residual herbicide was utilized, weed control increased. Envoke has little grass activity, so residual herbicides are needed to control annual grasses in conventional variety systems.

Figure 1. Experimental area showing winter rye cover and fallow plots, E.V. Smith Research and Extension Center, Shorter, Alabama

Cotton seed lint yield. In the 2005 Roundup™ system, the highest yield was attained in a standard three-pass system utilizing a Roundup™ application at both two and four-leaf growth stages followed by a layby in the winter fallow system (Figure

2). Cotton yields in the winter cover system were equivalent for all two-pass systems and the standard three-pass system. Yield was further reduced with reduced herbicide inputs. In the Roundup™ system, yields were less than or equal to 500 pounds per acre less than the high-residue rye cover crop system.

In the 2005 Ignite™ system, the highest equivalent yields were attained in both a standard three-pass system utilizing an Ignite™ application at both two- and four-leaf growth stages followed by a layby and the two-pass systems in the winter fallow system (Figure 3). Cotton yields in the winter cover system were equivalent for all two-pass systems and the standard three-pass system. Yield was reduced when only one herbicide application was made.

In the 2005 conventional system, the highest equivalent yields were attained in both a standard three-pass system utilizing an Envoke™ application at five-leaf growth stage followed by a layby and the two-pass systems in both the fallow and winter cover systems (Figure 4). Similar to the Roundup™ and Ignite™ systems, yield was reduced when only one herbicide application was made.

In the 2006 Roundup™ system, the highest yield was again attained in a standard three-pass system utilizing a Roundup™ application at both two and four-leaf growth stages followed by a layby, however, in the winter cover crop system (Figure 5). Cotton yields in the winter cover system were equivalent for the two-pass systems containing two Roundup™ applications and the two-pass system utilizing one Roundup™ application followed by layby in the fallow system. Yield was reduced when only one herbicide application was made.

In the 2006 Ignite™ system, the highest yield was attained in the standard three-pass system utilizing an Ignite™ application at both two- and four-leaf growth stages followed by a layby (Figure 6). Cotton yields in the winter cover system were equivalent for all two-pass systems. Yield was further reduced when only one herbicide application was made.

In the 2006 conventional system, the highest equivalent yields were attained in both a standard three-pass system utilizing an early preplant application of Valor™ followed by an Envoke™ application at five-leaf growth stage followed by a layby (Figure 7). The next highest yield was obtained following the two-pass systems in the winter cover system that included a preplant application of Valor™ followed by Envoke at five-leaf. Similar to the Roundup™ and Ignite™ systems, yield was reduced when only one herbicide application was made.

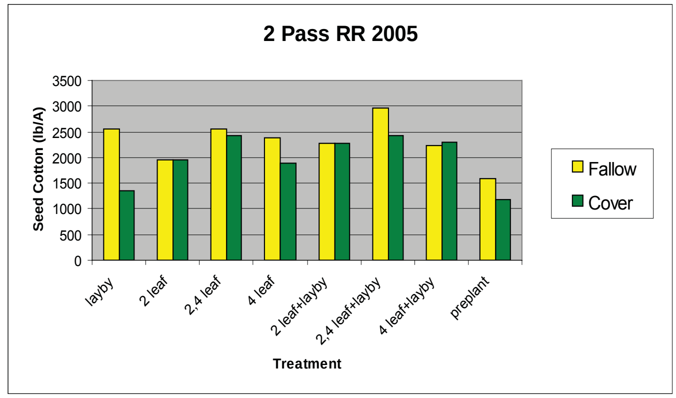


Figure 2

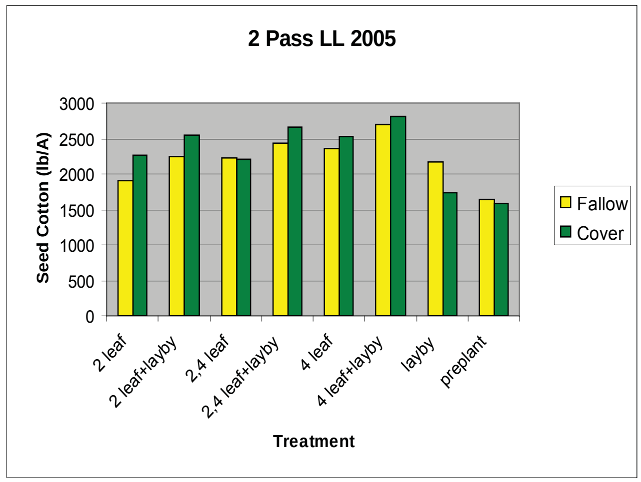


Figure 3

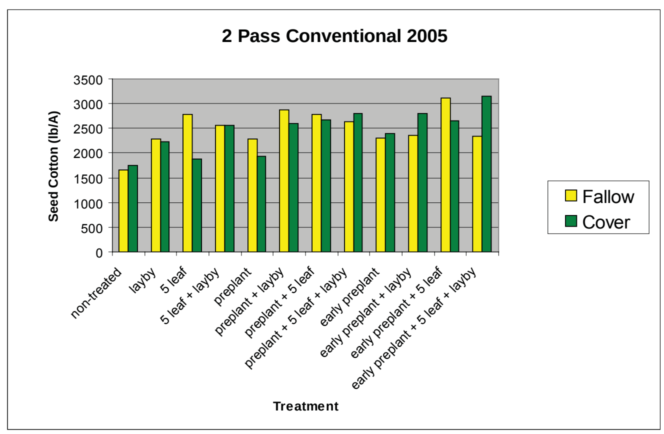
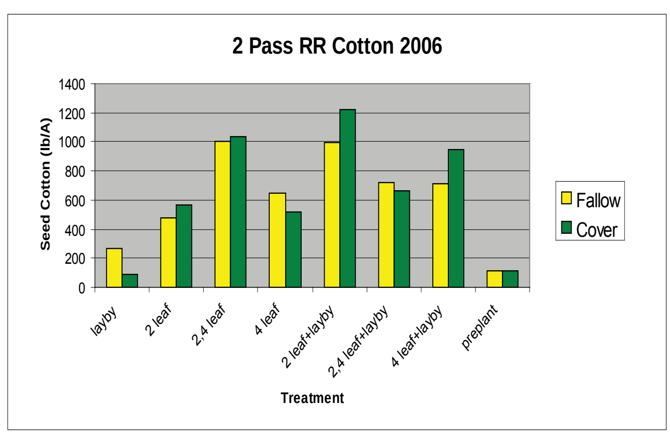


Figure 4



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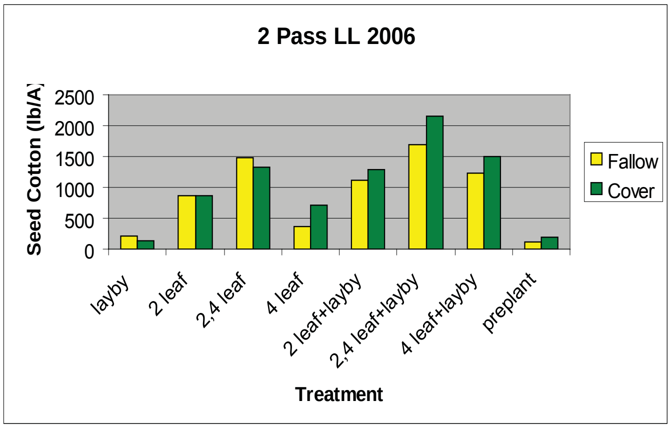


Figure 6

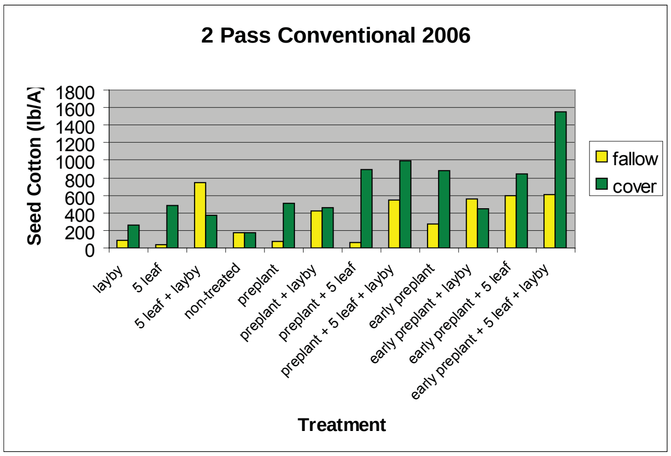


Figure 7

INSECTICIDES

THRIPS CONTROL ON SEEDLING COTTON

B. L. Freeman

This trial evaluated Temik, applied as an in-furrow granule, imidachloprid, applied as a seed treatment, and a combination of the two for thrips control on seedling cotton. Six treatments were replicated four times each with plots of four rows by 25 feet. The planting date was April 24. Thrips were sampled 3,4, and 5 weeks after planting by rinsing five plants from each plot in 70 percent ethyl alcohol, filtering the contents, and tallying adult and immature thrips with the aid of a stereoscope. Yields were determined via mechanical harvest of the two center rows from each plot.

One thrips larva per plant is often considered the beginning of significant reproduction. At 3 weeks after planting only the control plots revealed significant reproduction. By 4 weeks after planting both Temik alone treatments possessed unacceptable levels of thrips while treatments containing imidachloprid had roughly one larval thrips per plot. The thrips population was undergoing a cyclic decline at 5 weeks after planting. All insecticide treatments out yielded the control with the two combination treatments yielding the most.

NUMBERS OF THRIPS PER FIVE PLANTS

Insecticide	Days after planting									Cotton yield
	21			28			35			
	A [1]	L [1]	T [1]	A	L	T	A	L	T	*lb/ac*
Temik (3.5 lbs./ac.)	8	3	11	6	28	33	18	7	26	934
Temik (5.0 lbs./ac.)	6	2	8	4	13	16	18	6	24	997
Imidachloprid (0.375 mg/seed)	5	0	5	8	7	15	14	5	19	965
Temik (3.5 lbs./ac.) + imidachloprid (0.375 mg/seed)	4	0	4	5	6	10	16	9	25	1161
Temik (5.0 lbs./ac.) + imidachloprid (0.375 mg/seed)	5	1	5	6	3	9	16	8	24	1025
Control	4	29	32	4	27	31	18	7	25	908

[1] A = adult, L = larval, T = total.

EVALUATION OF AT-PLANTING ALTERNATIVES FOR EARLY SEASON INSECTS

R. H. Smith

The objective of this test was to determine the efficacy of selected insecticide seed treatments for control of thrips in cotton. This test was conducted at the Prattville Research Center, by planting four rows of DPL 555BG/RR cotton in a randomized complete block design with four replications. Treatments consisted of (1) Gaucho Grande, (2) Gaucho plus Clothianidin, (3) Cruiser, (4) Avicta CP, (5) Aeris, (6) Temik, and (7) an untreated control. Beginning the third week after planting, weekly surveys were conducted to determine thrips numbers present in each treatment using the drop cloth technique.

All treatments in this test reduced thrips numbers below that of the untreated control. Gaucho Grande was slightly superior to the other treatments while Gaucho plus Clothianidin was slightly inferior. The thrips damage rating for all treatments were similar and less than the untreated check (Figure 1). This same trend was true for the plant height measurements (Figure 2). Stand density was best in the Gaucho Grande and Temik treatments and lowest in the untreated.

The number of white blooms per 30 row feet was counted on July 5 as a measure of earliness (Figure 3). The untreated had significantly fewer blooms than all treatments while Temik had the greatest number. Another measure of earliness was made on August 18 by counting the number of open bolls per 30 row feet. Most treatments were similar, and all had more open bolls than the untreated by a factor of two. All treatments out yielded the untreated control (Figure 4). Temik was the highest yielding treatment, followed by Gaucho plus Clothianidin and Gaucho Grande. Cruiser was the lowest yielding of the at-planting treatments evaluated in this test. Both Avicta and the Bayer Exp. 3 (marked in 2007 as AERIS) yielded the same. This test was located on a research farm without irrigation and was severely impacted by drought.

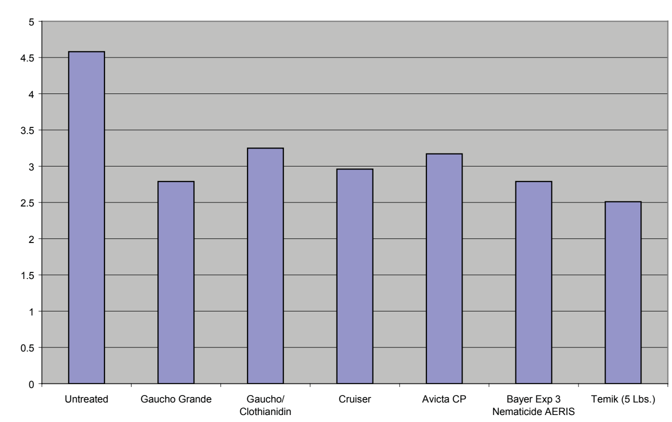


Figure 1. Damage rating, average of three observation dates (May 21, May 30, and June 5)

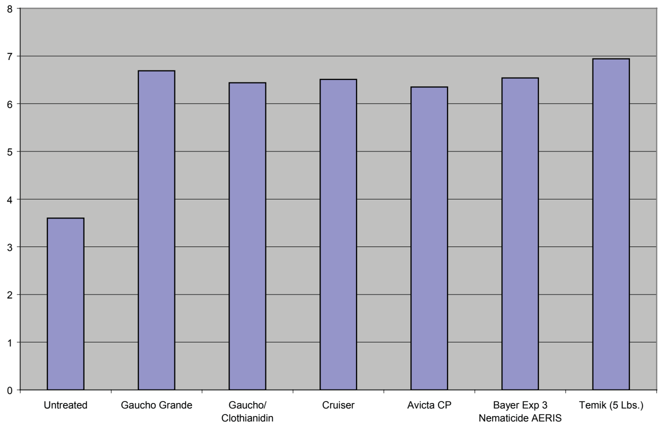


Figure 2. Plant height (inches), average of four observation dates (May 21, May 30, June 5, and June 12)

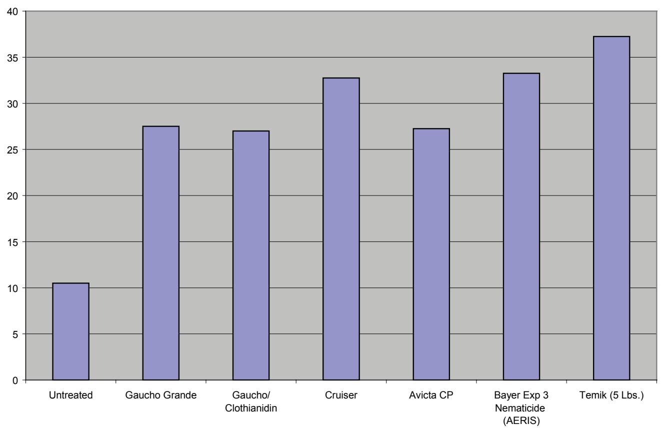


Figure 3. Number of white blooms per 30 row feet (July 5)

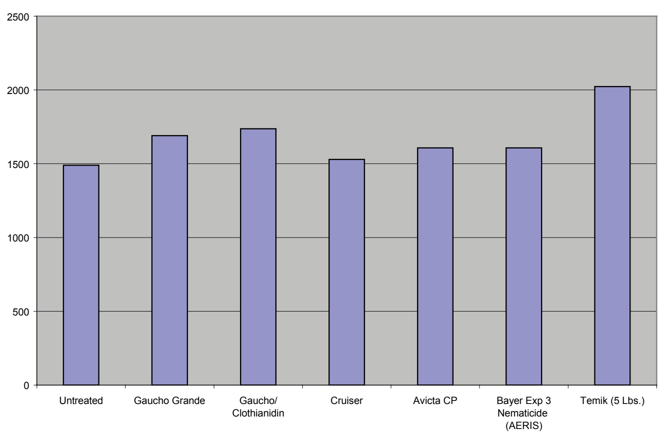


Figure 4. Pounds of seed cotton per acre

NEMATICIDES

Alabama's Beltwide Nematicide Test for 2006

W. S. Gazaway, K. S. Lawrence, and J. R. Akridge

The Beltwide Committee of Nematologists was created by the National Cotton Council and Rhone-Poulenc (now the Bayer AG Company) in the early 1990s to solve the growing nematode problem in cotton. The goal of this committee is to assist cotton producers in managing nematodes economically and more effectively. Since its inception, the committee has conducted numerous field trials, run surveys throughout the Cotton Belt, and published several publications on nematodes in cotton.

Of the nematodes that damage cotton, reniform nematodes cause the most damage to cotton in three southern states. Moreover, they cause substantial losses in other southern cotton production states. In Alabama, reniform nematodes reduce cotton production by an estimated $35 million annually. Alabama cotton growers have spent millions more on nematicides and on cultural practices in an attempt to control reniform.

In the past, nematicides have been successful in effectively managing nematodes in cotton. Telone and Temik have been the two most effective of the nematicides. Each of these nematicides has its advantages and disadvantages. The current goal of the committee is to evaluate new nematicides coming to market and to determine if they are equal to or better than the current nematicides now being used by cotton growers. Bayer AG Company recently introduced a new seed treatment nematicide that shows promise against reniform nematodes. A seed treatment nematicide would be well received by farmers because it would mean fewer trips through the field and would involve less equipment. Also included in this test is a new in-furrow granule (Bayer AG Company) with properties similar to Temik.

The objective of this test was to compare the effectiveness of two new nematicides with the standard nematicides, Telone II and Temik 15, in managing reniform nematodes in heavily reniform infested fields.

A cotton field on the Larry Ward farm, located near Huxford, Alabama, was selected for the test. The field has extremely high populations of reniform nematodes, which in the past have caused substantial losses in cotton production. This field, a sandy loam (56 percent sand, 29 percent silt, and 15 percent clay), has had test plots for the last 15 years. Treatments for the test are listed in the table. Gaucho Grande, an insecticide with some apparent nematicide properties, was used as a seed treatment for early insect control. Temik 15G and Telone II were included as positive checks. Temik 15G was incorporated as a side-dress treatment (treatment 3) approximately 6 inches to the side of the cotton plants at pinhead square on July 10, 2006. Plots were 25 feet long, 4 rows wide, and on a 3-foot row spacing. Treatments were arranged in a randomized complete block design and replicated six times. Soil samples for nematode analyses were collected from the two inner rows of each plot on May 17, July 10, and August 10, 2006, 4 weeks following the Temik 15G side-dress application. The cotton variety DPL-555BG/RR was planted on May 17, 2006 and harvested from the two inner rows of each plot on September 28, 2006. Cultural practices, weed control, and insect control were followed according to Alabama Cooperative Extension recommendations.

Reniform nematode populations in the spring were well above threshold level (865 juveniles per 100cc) according to soil samples taken at planting on May 17, 2006. Telone reduced reniform nematode populations 7 weeks after planting (July 10, 2006) whereas the other nematicides did not. However, by August 10, 2006 (4 weeks after the post-plant Temik application), Temik at planting, Temik at planting plus a Temik side-dress application at pinhead square, and Gaucho Grande treated seed treatments had fewer reniform nematodes than Avicta or the treatments receiving no nematicide (see table). These population differences did not affect cotton yield statistically. However, all nematicides did appear to numerically improve seed cotton production over the untreated check by almost 200 pounds per acre. The lack of a greater yield response to nematicides could be due to the absence of stress on cotton in these plots. The test area received timely rains during last half of the growing season, creating ideal growing conditions for cotton. When these conditions occur, reniform causes little damage to cotton.

Nematicide Treaments for Reniform Nematodes in Cotton, 2006

	Nematicide	Rate	Application	Reniform/100 cc soil July 10	Reniform/100 cc soil Aug. 10	Seed cotton *lb/ac*
1	Gaucho Grande	0.375 mg ac/seed	Treated by Bayer AG Company	1153a	2839ab	1173a
2	Temik15G	5 lb/ac	In the seed furrow at planting	1151a	1780bc	1770a
3	Temik 15G +	5 lb/ac	In the seed furrow at planting	1101a	2774ab	1740a
	Temik 15G	5 lb/ac	Side dressed at pinhead square			
4	Avicta Complete Pak	See label	Contains Dynasty, Cruiser, and Avicta	1424a	3961a	1816a
5	Telone II	3 gal/ac	Injected 18 in deep 3 wk prior to planting	331b	1276c	1833a
6	Untreated check			1251a	3561a	1574a
	LSD (0.05)					**396.5**

THE EFFECT OF TWO NEW BAYER AG COMPANY NEMATICIDES, AERIS® AND KC791230R, ON COTTON PRODUCTION IN A FIELD WITH A HIGH POPULATION OF RENIFORM NEMATODES, 2006

W. S. Gazaway, K. S. Lawrence, and J.R. Akridge

Reniform nematodes reduce cotton production by $35 million annually in Alabama. Millions more are spent on nematicides and on cultural practices to manage this devastating pest. In the past Telone and Temik have been used in cotton with a degree of success to control both reniform and root-knot nematode. Bayer AG Company recently introduced a new seed treatment nematicide and a new granule with similar properties to Temik.

A test was conducted to compare the effectiveness of these two new nematicides to the standard nematicides, Telone II and Temik 15, for managing reniform nematodes in heavily reniform infested fields.

A cotton field belonging to Larry Ward near Huxford, Alabama, was selected for the test. The field has extremely high populations of reniform nematodes, which in the past have caused substantial losses in cotton production. This field, a sandy loam (56 percent sand, 29 percent silt, and 15 percent clay), has had test plots for the last 15 years. Gaucho Grande, an insecticide with some apparent nematicide properties, was used as a seed for early insect control. Temik 15G and Telone II, both commonly recommended nematicides, were included as positive checks. Temik 15G was incorporated as a side-dress treatment (treatment 4) in the row approximately 6 inches to the side of the cotton plants at pinhead square on July 10, 2006. Plots were 25 feet long, four rows wide, and on a 3-foot row spacing. Treatments were arranged in a randomized complete block design and replicated six times. Soil samples for nematode analyses were collected on July 10, 2006, and 4 weeks following the Temik 15G side-dress application (August 10, 2006). An initial soil sample was collected from the research area prior to planting cotton variety DPL-555BG/RR on May 17, 2006. Cotton plots were harvested on September 28, 2006. Cultural practices, weed control, and insect control were followed according to Alabama Cooperative Extension recommendations.

Soil samples taken on May 17, 2006 just prior to planting indicated reniform nematode populations were well above threshold level (815 juveniles per 100cc). By July 10, 2006, approximately 7 weeks after planting, only the Telone II treatment had significantly lower reniform populations (see table). By August 10, 2006, reniform nematode populations had rebounded in the Telone-treated plots to levels similar to the other treated plots. Cotton production did not appear to be reduced substantially by reniform nematodes in 2006. The test area received timely rains and consequently cotton was not stressed during the last half of the growing season. For some unknown reason, cotton yields receiving the Temik at planting and in the AERIS treatments were lower than the other treatments and the untreated check. There was apparently no phytotoxicity from the Temik at planting treatment because the Temik at planting plus the Temik 15G side-dress treatment produced the best yield (see table).

TREATMENTS FOR RENIFORM NEMATODES IN COTTON, 2006

	Nematicide	Rate	Application	Reniform/100 cc soil July 10	Reniform/100 cc soil Aug. 10	Seed cotton[1] *lb/ac*
1	Check		Fungicide treated seed only	626 bc	4111 a	1704 ab
2	Temik 15G	5 lb/ac	Applied in the seed furrow at planting	696 bc	4164 a	1594 b
3	KC791230	5 lb/ac	Applied in the seed furrow at planting	1032 ab	4157 a	1739 ab
4	Temik 15G +	5 lb/ac	Applied in the seed furrow at planting	1354 a	4334 a	1842 a
	Temik 15G	5 lb/ac	Side dressed post-plant at pinhead square			
5	AERIS	0.1 mg a/l	Commercial seed treatment	967 ab	3854 a	1595 b
6	Telone II	3 gal/ac	Pre-plant fumigant	172 c	2958 a	1797 ab
LSD(P=0.05)				**439.4**	**1495.7**	**208.5**
Std. Deviation				**368.7**	**1257.6**	**174.9**

[1] Cotton was harvested on September 27.

Evaluation of Avicta, Vydate CLV, and Temik 15G Combinations for Reniform Nematode Management in Cotton in North Alabama, 2006

K. S. Lawrence, T. B. Hatchett, C. H. Burmester, G. W. Lawrence, and B. E. Norris

Vydate CLV, Temik 15 G, and Avicta were evaluated for the management of reniform nematodes in a naturally infested producer's field near the Tennessee Valley Research and Extension Center in Belle Mina, Alabama. The field had a history of reniform nematode infestation and the soil type was a Decatur silty loam. Avicta and Gaucho Grande were applied to the seed by the manufacturer. Temik 15G (5 pounds per acre) was applied at planting on May 16 in the seed furrow with chemical granular applicators attached to the planter. Vydate C-LV was applied as a foliar spray at the four to sixth true leaf plant growth stage with a two-row, CO_2-charged, back-pack sprayer. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrip control. Plots consisted of two rows, 25 feet long, with a 40-inch row spacing and were arranged in a randomized complete block design with five replications. Blocks were separated by a 20-foot alley. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the reniform nematode were determined at 28, 76, and 130 days after planting (DAP). Ten soil cores, 2.45-cm in diameter and 20 cm deep were collected from the two rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 3. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode pressure was moderate in 2006 in north Alabama. Rainfall was limited to 11.2 inches for the first 6 weeks after planting. Reniform nematode numbers at planting averaged 3353 vermiform life stages per 150 cc of soil at planting. Cotton seedling stand was similar between all treatments. At 28 DAP reniform numbers had increased above the planting level in six of the treatments. By 77 DAP, reniform numbers had not increased due to the drought and no differences ($P \leq 0.05$) in population numbers were observed between any treatments. At harvest at 133 DAP, all populations had dropped below the pre plant levels observed in May. Seed cotton yields varied by 555 pounds per acre at harvest with an average of 2646 pounds per acre of seed cotton produced over all nematicides. Yields averaged 2715 pounds per acre over the Gaucho Grande treatments followed by 2697pounds per acre in the Temik 15G treatments and 2688 pounds per acre in the Avicta treatments. The addition of Vydate produced an average yield of 2647 pounds per acre. All nematicide treatments increased yields as compared to the non-treated control under these drought conditions in north Alabama.

Effects of Avicta, Vydate, and Temik 15G on Reniform Populations and Seed Cotton Yield in North Alabama

Treatment	Rate	Application	Stand 8 m [1]	–*R. reniformis* per 150 cc soil– 28 DAP [2]	77 DAP	133 DAP	Seed cotton *lb/ac*
Gaucho Grande	0.375 mg ai/seed	seed	82.6	3229 ab	2142	556.2 c	2771 a
Gaucho Grande + Vydate	0.375 mg ai/seed + 17 oz/ac	seed + 2-5 leaf	69.8	5840 a	1854	695.3 bc	2659 a
Avicta	32 g/100 kg seed + 0.34 + 0.15 mg/seed	seed	84.2	1916 b	2503	509.9 c	2832 a
Avicta + Vydate	32 g/100 kg seed + 0.34 + 0.15 mg/seed + 17 oz/ac	seed + 2-5 leaf	85.2	3461 ab	3461	1622.3 ab	2552 ab
Avicta + Temik + Vydate	32 g/100 kg seed + 0.34 + 0.15 mg/seed + 5 lb/ac +17 oz/ac	seed + IF + 2-5 leaf	83.8	3955 ab	2936	1684.1 a	2681 a
Temik 15G	5 lb/ac	IF	75.0	3600 ab	3863	1869.5 a	2698 a
Temik 15G + Vydate	5 lb/ac +17 oz/ac	IF +2-5 leaf	84.2	3893 ab	2518	1097.0 a	2698 a
Untreated	- -		74.6	3940 ab	2894	973.4 abc	2277 b
LSD P=0.05			**16.1**	**3221**	**3369**	**986.9**	**330**

[1] Plant stand was based on number of seedlings per 25 feet of row.

[2] DAP = days after planting.

Column numbers followed by the same letter are not significantly different according to Fishers least significant difference test at ($P \leq 0.05$).

EVALUATION OF AVICTA, VYDATE CLV, AND TEMIK 15G COMBINATIONS FOR RENIFORM NEMATODE MANAGEMENT IN COTTON IN SOUTH ALABAMA, 2006

K. S. Lawrence, T. B. Hatchett, W. S. Gazaway, G. W. Lawrence, and J. R. Akridge

Vydate CLV, Temik 15 G, and Avicta were evaluated for the management of reniform nematodes in a naturally infested producer's field near Huxford, Alabama The field had a history of reniform nematode infestation and the soil type was classified as a sandy loam. Avicta and Gaucho Grande were applied to the seed by the manufacturer. Temik 15G (5 pounds per acre) was applied at planting on May 17 in the seed furrow with chemical granular applicators attached to the planter. Vydate C-LV was applied as a foliar spray at the four to sixth true leaf plant growth stage with a two-row, CO_2-charged, back-pack sprayer. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of four rows, 25 feet long, with a 36-inch row spacing and were arranged in a randomized complete block design with six replications. Blocks were separated by a 20-foot alley. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the reniform nematode were determined at 40, 80, and 135 days after planting (DAP). Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the center rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 6. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode pressure was moderate in 2006 in south Alabama. Rainfall was limited to 10.16 inches for the first 6 weeks after planting. Reniform nematode numbers at planting averaged 940 vermiform life stages per 150 cc of soil at planting. Cotton seedling stand was similar between all treatments ranging from a low of 69.8 in the Gaucho Grande plus Vydate treatment to 85.2 in the Avicta plus Vydate combination. At 40 DAP reniform numbers had increased above the threshold level in all treatments except Avicta although there were no significant differences ($P \leq 0.05$) between the treatments. By 84 DAP, reniform numbers increased with no differences ($P \leq 0.05$) between the treatments. The Avicta plus Temik plus Vydate combination treatment had the lowest reniform numbers by 135 DAP. Seed cotton yields varied by 119 pounds per acre at harvest with an average of 1503 pounds per acre of seed cotton produced over all nematicides. Yields averaged 1537.5 pounds per acre over the Gaucho Grande treatments followed by 1492.6 in the Temik 15G treatments and 1488 in the Avicta treatments. No nematicide treatment increased yields as compared to the non-treated control under these drought conditions. The lack of rainfall for several weeks following planting most probably attributed to the

EFFECTS OF AVICTA, VYDATE, AND TEMIK 15G ON RENIFORM POPULATIONS AND SEED COTTON YIELD IN SOUTH ALABAMA

Treatment	Rate	Application	Stand [1]	–*R. reniformis* per 150 cc soil– 40 DAP [2]	84 DAP	135 DAP	Seed cotton *lb/ac*
Gaucho Grande	0.375 mg ai/seed	seed	82.6	2060	6180	1390 a	1510.5
Gaucho Grande + Vydate	0.375 mg ai/seed + 17 oz/ac	seed + 2-5 leaf	69.8	1583	5974	1437 a	1564.0
Avicta	32 g/100 kg seed + 0.34 + 0.15 mg/seed	seed		952	4532	897 ab	1532.2
Avicta + Vydate	32 g/100 kg seed + 0.34 + 0.15 mg/seed + 17 oz/ac	seed + 2-5 leaf	85.2	1892	5330	742 ab	1451.6
Avicta + Temik + Vydate	32 g/100 kg seed + 0.34 + 0.15 mg/seed + 5 lb/ac +17 oz/ac	seed + IF + 2-5 leaf	83.8	1248	4287	540 b	1481.3
Temik 15G	5 lb/ac	IF	75.0	1648	3348	1180 ab	1444.7
Temik 15G + Vydate	5 lb/ac +17 oz/ac	IF +2-5 leaf	84.2	2008	3760	961 ab	1540.5
Untreated	- -		74.6	1545	3438	1098 ab	1527.0
LSD P=0.05			**16.1**	**1455**	**2891**	**808**	**268.7**

[1] Plant stand was based on number of seedlings per 25 feet of row.
[2] DAP = days after planting.
Column numbers followed by the same letter are not significantly different according to Fishers least significant difference test at ($P \leq 0.05$).

Evaluation of Experimental Gaucho Grande Formulations for Reniform Nematode Management in Cotton in North Alabama, 2006

K. S. Lawrence, T. B. Hatchett, C. H. Burmester, and B. E. Norris

Experimental Gaucho Grande formulations were evaluated for the management of reniform nematode in a naturally infested producer's field near the Tennessee Valley Research and Extension Center in Belle Mina, Alabama. The field had a history of reniform nematode infestation and the soil type was a Decatur silty loam. All experimental seed treatments were applied to the seed by the manufacturer. Temik 15G (5 pounds per acre) was applied at planting on May 16 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrip control. Plots consisted of two rows, 25 feet long, with a 40-inch row spacing and were arranged in a randomized complete block design with five replications. Blocks were separated by a 20-foot alley. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the reniform nematode were determined at 28, 76 and 130 days after planting (DAP). Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the two rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 3. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode pressure was moderate in 2006 in north Alabama. Rainfall was limited to 11.2 inches for the first 6 weeks after planting. Reniform nematode numbers at planting averaged 1267 vermiform life stages per 150 cc of soil at planting. Cotton seedling stand was similar between all treatments. At 28 DAP reniform numbers were lower ($P \leq 0.05$) in the Gaucho Grande FS plus exp 3 at the mid rate as compared to the BCSTON 02100602 plus L1505A seed treatment. By 77 DAP, reniform numbers had decreased probably due to the drought although the BCSTON 02100602 plus L1505A seed treatment continued to have larger reniform population numbers ($P \leq 0.05$) as compared to Gaucho Grande FS with or without GB 126. At harvest at 133 DAP, reniform numbers were low and no differences were observed between treatments. Seed cotton yields varied by 435 pounds per acre at harvest with an increase of 264 pounds per acre of seed cotton averaged over all nematicides. The application of Temik 15 G increased yield by 435 pounds per acre. The Gaucho Grande FS plus exp 3 over all three rates increased yield by 265 pounds per acre. The Gaucho Grande FS plus GB 126 seed treatment yield was similar to all the Gaucho Grande FS plus exp 3 and Temik 15 G nematicide treatments. All nematicide treatments numerically increased yields as compared to the non-treated control under these drought conditions in north Alabama.

Effects of Experimental Gaucho Grande Formulations on Reniform Populations and Seed Cotton Yield in North Alabama

Treatment	Rate/seed	Stand [1]	–*R. reniformis* per 150 cc soil– 28 DAP [2]	77 DAP	133 DAP	Seed cotton *lb/ac*
1 Untreated		95	2132 ab	587 ab	185.4	2100 bc
2 Gaucho Grande FS	0.375 mg ai	96	711 ab	309 b	154.5	2320 abc
3 Gaucho Grande FS + GB126	0.375 mg ai	100	1097ab	232 b	231.8	2387 abc
4 Gaucho Grande FS + exp 3	0.375 mg ai+ 350 g ai/100 kg	93	556 b	603 ab	170.0	2306 abc
5 Gaucho Grande FS + exp 3	0.375 mg ai+ 375 g ai/100 kg	101	1267 ab	680 ab	170.0	2367 abc
6 Gaucho Grande FS + exp 3	0.375 mg ai+ 500 g ai/100 kg	92	819 ab	773 ab	195.7	2423 ab
7 BCSTON 02100602 + L1505A	0.34 +0.15 mg ai	98	2997 a	1035 a	262.7	2211 bc
8 Temik 15G	840 g ai/ha (7 lb/ac)	93	1174 ab	556 ab	432.6	2535 a
LSD (0.05)		**13**	**2305**	**623**	**286**	**288**

[1] Plant stand was based on number of seedlings per 25 feet of row.

[2] DAP = days after planting.

Column numbers followed by the same letter are not significantly different according to Fishers least significant difference test at ($P \leq 0.05$).

Evaluation of Experimental Gaucho Grande Seed Treatment Formulations for Reniform Nematode Management in Cotton in South Alabama, 2006

K. S. Lawrence, T. B. Hatchett, W. S. Gazaway, and J. R. Akridge

Experimental Gaucho Grande formulations were evaluated for the management of reniform nematode in a naturally infested producer's field near Huxford, Alabama. The field had a history of reniform nematode infestation and the soil type was classified as a sandy loam. All seed treatment formulations were applied to the seed by the manufacturer. Temik 15G (5 pounds per acre) was applied at planting on May 17 in the seed furrow with chemical granular applicators attached to the planter. Plots consisted of two rows, 25 feet long, with a 36-inch row spacing and were arranged in a randomized complete block design with six replications. Blocks were separated by a 20-foot alley. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control during the first 6 weeks after planting. Population densities of the reniform nematode were determined at 40, 80 and 135 days after planting (DAP). Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the center rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 6. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode pressure was moderate in 2006 in south Alabama probably due to limited rainfall (10.16 inches) for the first 6 weeks after planting. Reniform nematode numbers at planting averaged 1159 vermiform life stages per 150 cc of soil. At 40 DAP reniform numbers had increased above the initial planting population in all but one treatment. The seed treatments Gaucho Grande FS plus GB 126 and BCSTON 02100602 plus L1505A had fewer nematodes ($P \leq 0.05$) as compared to Gaucho Grande FS plus exp 3 at the mid rate. By 85 DAP, reniform numbers increased in all plots; however, BCSTON 02100602 plus L1505A and Temik 15 G ($P \leq 0.05$) supported lower levels of reniform than the Gaucho Grande FS plus exp 3 at the high rate. All reniform numbers had dropped to below at plant populations by 133 DAP. Seed cotton yields varied by 297 pounds per acre at harvest with an average of 1785 pounds per acre for the Gaucho Grande FS + exp 3 over all rates. No nematicide treatment increased yields as compared to the non-treated control under these drought conditions. However, yields in the BCSTON 02100602 plus L1505A treatment were greater than those in the Gaucho Grande FS plus GB 126 and Temik 15 G plots.

Effects of Experimental Gaucho Grande Seed Treatment Formulations on Reniform Populations and Seed Cotton Yield in South Alabama

Treatment	Rate/seed	Application	–*R. reniformis* per 150 cc soil– 40 DAP[1]	85 DAP	133 DAP	Seed cotton *lb/ac*
1 Untreated			1365 ab	7377 ab	798	1706.0 ab
2 Gaucho Grande FS	0.375 mg ai	seed	1481 ab	5455 ab	571	1857.0 ab
3 Gaucho Grande FS + GB 126	0.375 mg ai	seed	1172 b	5356 ab	571	1685.3 b
4 Gaucho Grande FS + exp 3	0.375 mg ai+250 g ai/100kg	seed	1687 ab	6674 ab	713	1719.3 ab
5 Gaucho Grande FS + exp 3	0.375 mg ai+375 g ai/100 kg	seed	2253 a	5601 ab	481	1863.9 ab
6 Gaucho Grande FS + exp 3	0.375 mg ai+500 g ai/100 kg	seed	1558 ab	9918 a	790	1773.4 ab
7 BCSTON 02100602 + L1505A	0.34 +0.15 mg ai	seed	876 b	3558 b	691	1955.5 a
8 Temik 15G	840 g ai/ha (7 lb/ac)	infurrow	1378 ab	2600 b	687	1658.2 b
LSD (0.05)			**1073**	**5087**	**430**	**266**

[1] DAP = days after planting.

Column numbers followed by the same letter are not significantly different according to Fishers least significant difference test at ($P \leq 0.05$).

EVALUATION OF EXPERIMENTAL TEMIK FORMULATIONS FOR RENIFORM NEMATODE MANAGEMENT IN COTTON IN NORTH ALABAMA, 2006

K. S. Lawrence, T. B. Hatchett, C. H. Burmester, and B. E. Norris

The experimental Temik KC791230 formulation was evaluated for the management of reniform nematode in a naturally infested producer's field near the Tennessee Valley Research and Extension Center in Belle Mina, Alabama. The field had a history of reniform nematode infestation and the soil type was a Decatur silty loam. Temik 15G (5 pounds per acre) and KC791230 were applied at planting on May 16 in the seed furrow with chemical granular applicators attached to the planter. The experimental 1 seed treatment was applied to the seed by the manufacturer. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrip control. Plots consisted of two rows, 25 feet long, with a 40-inch row spacing and were arranged in a randomized complete block design with five replications. Blocks were separated by a 20-foot alley. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the reniform nematode were determined at 28, 76 and 130 days after planting (DAP). Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the two rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 3. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode pressure was moderate in 2006 in north Alabama. Rainfall was limited to 11.2 inches for the first 6 weeks after planting. Reniform nematode numbers at planting averaged 2735 vermiform life stages per 150 cc of soil at planting. Cotton seedling stand was similar between all treatments. At 28 DAP reniform numbers had increased above the planting level in three of the five of the treatments although differences were not significant ($P \leq 0.05$). By 77 DAP, reniform numbers had decreased, probably due to the drought, and no differences ($P \leq 0.05$) in population numbers were observed between any treatments. At harvest at 133 DAP, reniform numbers were lower in the Temik 15 G side-dress treatment as compared to the Experimental 1 seed treatment. Seed cotton yields varied by 884 pounds per acre at harvest with an average of increase of 617 pounds per acre of seed cotton produced over all nematicides. The application of Temik 15 G increased yield by 390 pounds per acre with the addition of a side-dress application increasing yields an additional 175 pounds per acre. The experimental KC791230 produced the highest yields increasing seed cotton by 30 percent compared to the untreated control. The Experimental 1 seed treatment yields were similar to all nematicide treatments. All nematicide treatments numerically increased yields as compared to the non-treated control under these drought conditions in north Alabama.

EFFECTS OF EXPERIMENTAL TEMIK FORMULATIONS ON RENIFORM POPULATIONS AND SEED COTTON YIELD IN NORTH ALABAMA

Treatment	Rate	Application	Stand [1]	–*R. reniformis* per 150 cc soil– 28 DAP [2]	77 DAP	133 DAP	Seed cotton *lb/ac*
1 Untreated			92.8	3306	2287	3507 ab	2144 b
2 Temik 15 G	0.75 lb ai/ac	IF	81.4	3955	2148	3198 ab	2534 ab
3 KC791230	0.75 lb ai/ac	IF	98.8	2024	2348	4110 ab	3028 a
4 Temik 15 G	0.75 lb ai/ac	IF + SD	94.6	2596	1360	1560 b	2709 ab
5 Experimental 1	0.1 mg ai/seed	seed	101.6	2796	2966	5794 a	2775 ab
LSD P≤0.05			**20.2**	**3305**	**2709**	**2965**	**637**

[1] Plant stand was based on number of seedlings per 25 feet of row.
[2] DAP = days after planting.
Column numbers followed by the same letter are not significantly different according to Fishers least significant difference test at ($P \leq 0.05$).

EVALUATION OF EXPERIMENTAL TEMIK FORMULATIONS FOR RENIFORM NEMATODE MANAGEMENT IN COTTON IN SOUTH ALABAMA, 2006

K. S. Lawrence, T. B. Hatchett, W. S. Gazaway, and J. R. Akridge

The experimental Temik KC791230 formulation was evaluated for the management of reniform nematode in a naturally infested producer's field near Huxford, Alabama. The field had a history of reniform nematode infestation and the soil type was classified as a sandy loam. Temik 15G (5 pounds per acre) and KC791230 were applied at planting on May 17 in the seed furrow with chemical granular applicators attached to the planter. The Experimental 1 seed treatment was applied to the seed by the manufacturer. Plots consisted of 4 rows, 25 feet long, with a 36-inch row spacing and were arranged in a randomized complete block design with six replications. Blocks were separated by a 20-foot alley. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control during the first 6 weeks after planting. Population densities of the reniform nematode were determined at 40, 80 and 135 days after planting (DAP). Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the center rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 6. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode pressure was moderate in 2006 in south Alabama. Rainfall was limited to 10.16 inches for the first 6 weeks after planting. Reniform nematode numbers at planting averaged 1583 vermiform life stages per 150 cc of soil. At 40 DAP reniform numbers had not increased above the initial planting population in any of the treatments. The reniform populations were numerically lower in the four nematicide treatments as compared to the untreated control. By 84 DAP, reniform numbers increased with no differences ($P \leq 0.05$) between the Temik and KC791230 treatments. The Experiment 1 seed treatment did have higher reniform populations ($P \leq 0.05$) than all other treatments. However, by harvest all reniform populations had decreased below the initial plant levels in all treatments. Seed cotton yields varied by 336 pounds per acre at harvest with an average of 1680 pounds per acre of seed cotton produced over all nematicides. No nematicide treatment increased yields as compared to the non treated control under these drought conditions. The lack of rainfall for several weeks following planting most probably attributed to the lack of response from the nematicide treatments.

EFFECTS OF EXPERIMENTAL GAUCHO GRANDE SEED TREATMENT FORMULATIONS ON RENIFORM POPULATIONS AND SEED COTTON YIELD IN SOUTH ALABAMA

Treatment	Rate	Application	–*R. reniformis* per 150 cc soil– 40 DAP[1]	84 DAP	134 DAP	Seed cotton *lb/ac*
1 Untreated			1313 a	2150 b	524	1949 a
2 Temik 15 G	0.75 lb ai/ac	IF[2]	575 b	1339 b	545	1753 ab
3 KC791230	0.75 lb ai/ac	IF	773 ab	2446 b	558	1689 ab
4 Temik 15 G	0.75 lb ai/ac	IF + SD	927 ab	1648 b	588	1665 ab
5 Experimental 1	0.1 mg ai/seed	seed	953 ab	3618 a	511	1613 b
LSD P≤0.05			**593.7**	**1142**	**407**	**293**

[1] DAP = days after planting.
[2] IF = in furrow, SD = side dress.
Column numbers followed by the same letter are not significantly different according to Fishers least significant difference test at ($P \leq 0.05$).

EVALUATION OF AVICTA VARIANTS FOR RENIFORM NEMATODE MANAGEMENT IN COTTON IN SOUTH ALABAMA, 2006

K. S. Lawrence, T. B. Hatchett, W. S. Gazaway, and J. R. Akridge

Avicta variants, A14905, B, E, F, G, H, and A15422A, were evaluated for the management of reniform nematodes in a naturally infested producer's field near Huxford, Alabama. The field had a history of reniform nematode infestation and the soil type was classified as a loam. Avicta variants were applied to the seed by the manufacturer. Temik 15G (5 pounds per acre) was applied at planting on May 17 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of two rows, 25 feet long, with a 36-inch row spacing and were arranged in a randomized complete block design with six replications. Blocks were separated by a 20-foot alley. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the reniform nematode were determined at 40, 80, and 135 days after planting (DAP). Ten soil cores, 2.45 cm. in diameter and 20 cm deep were collected from the center rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 6. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode pressure was moderate in 2006 in south Alabama. Reniform nematode numbers at planting averaged 2897 vermiform life stages per 150 cc of soil at planting. Cotton seedling stand was increased ($P \leq 0.05$) by all the Avicta variants treatments (3 – 8) as compared to the Dynasty CST 125FS plus Cruiser 5FS plus Temik 15 G treatments (9 and 10). All treatments combined with Temik 15 G produced lower stands than the Avicta variants and the Dynasty CST 125FS plus Cruiser 5FS (1) control with or without Avicta (2). At 40 DAP, reniform numbers had decreased in all treatments and were 39 to 72 percent lower than at planting. However, by 84 DAP reniform numbers increased in all treatments with variants B and E supporting lower populations than variant H. By harvest at 135 DAP, all populations had decreased to levels below those found at planting. Seed cotton yields varied by 240 pounds per acre with an average of 1932 pounds per acre of seed cotton produced over all nematicides. Yields were numerically higher in the A14905B (3) and 7 A14905H (7) treatments as compared to the Dynasty CST 125FS plus Cruiser 5FS (1) control treatment. The two Temik 15G treatments were not different ($P \leq 0.05$) from the standard Avicta seed treatment (2). The lack of rainfall for several weeks following planting most probably attributed to the lack of response from the nematicide treatments.

EVALUATION OF AVICTA VARIANTS ON RENIFORM POPULATIONS AND SEED COTTON YIELD IN SOUTH ALABAMA

Treatment	Rate/seed	Stand [1]	–*R. reniformis* per 150 cc soil– 40 DAP [2]	84 DAP	135 DAP	Seed cotton *lb/ac*
1 Dynasty CST 125FS Cruiser 5 FS	0.34 + 0.03	77.8 a	1145.9 b	4790 ab	1622.3 a	1931 ab
2 Dynasty CST 125FS + Cruiser 5 FS + Avicta	0.34 + 0.03 +0.15	63.7 ab	2755.3 a	4957 ab	1328.7 ab	1915 ab
3 A14905B	0.54	63.0 ab	1789.6 ab	3644 b	1220.6 ab	1973 ab
4 A14905E	0.54	68.0 a	1480.6 b	4120 b	1189.7 ab	1820 ab
5 A14905F	0.54	76.2 a	1493.5 ab	5034 ab	726.2 b	1822 ab
6 A14905G	0.54	75.2 a	1570.8 ab	6103 ab	1127.9 ab	1913 ab
7 A14905H	0.54	68.8 a	1158.8 b	8510 a	880.7 b	1962 ab
8 A15422A	0.54	63.5 ab	1532.1 ab	6206 ab	849.8 b	1908 a
9 Dynasty CST 125FS + Cruiser 5 FS Temik 15 G	0.34 + 0.03 5 lb/ac	47.0 bc	2111.5 ab	2794 b	695.3 b	2006 ab
10 Dynasty CST 125FS + Cruiser 5 FS Temik 15 G + Temik 15 G (side dress)	0.34 + 0.03 5 lb/ac + 5 lb/ac	31.5 c	1248.9 b	3116 b	602.6 b	2061 b
11 Dynasty CST 125FS + Cruiser 5 FS + Avicta Temik 15 G	0.34 + 0.03 + 0.15 5 lb/ac	45.7 bc	1248.9 b	4983 ab	1282.4 ab	2000 ab
LSD P≤0.05		**20.9**	**1275**	**4235**	**741.1**	**216.1**

[1] Plant stand was based on number of seedlings per 25 feet of row.
[2] DAP = days after planting.
Column numbers followed by the same letter are not significantly different according to Fishers least significant difference test at ($P \leq 0.05$).

Evaluation of Avicta Variants for Root-Knot Nematode Management in Cotton in Central Alabama, 2006

K. S. Lawrence, T. B. Hatchett, and S. Nightengale

Avicta variants, A14905, B, E, F, G, H, and A15422A, were evaluated for the management of root-knot nematodes in a naturally infested field at the Plant Breeding Unit of the E. V. Smith Research and Extension Center near Shorter, Alabama. The field had a history of root-knot nematode infestation and the soil type was a Marvyn sandy loam. Avicta variants were applied to the seed by the manufacturer. Temik 15G (5 pounds per acre) was applied at planting on April 20 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of two rows, 25 feet long, with a 40-inch row spacing and were arranged in a randomized complete block design with five replications. Blocks were separated by a 20-foot alley. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the root-knot nematode were determined at 40, 80 and 135 days after planting (DAP). Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the center rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 6. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Root-knot nematode pressure was moderate in 2006 in central Alabama due to drought conditions during the growing season. Cotton seedling stand was increased ($P \leq 0.05$) by the Avicta variant A14905E (4) as compared to variant A14905EB (3) and the Dynasty plus Cruiser plus Temik plus Vydata (9). All remaining variant treatments produced similar stands as compared to the Dynasty CST 125FS plus Cruiser 5FS control with or without Avicta and/or Temik 15 G. Root-knot nematode numbers at planting averaged 185 second stage juvenile life forms per 150 cc of soil. At 30 DAP, root-knot numbers had decreased in all treatments and were 62 to 88 percent lower than at plant populations. Avicta variants A14905 B, E, R, G, and H all had fewer root galls as compared to the Dynasty CST 125FS plus Cruiser 5FS (1) control but were similar to the Dynasty CST 125FS plus Cruiser 5FS plus Avicta plus Temik 15 G (10) treatment. Seed cotton yields varied by 1121 pounds per acre with an average of 2466 pounds per acre over all nematicides. Yields were highest ($P \leq 0.05$) in the Dynasty CST 125FS plus Cruiser 5FS plus Avicta, plus Temik 15 G (10), the Dynasty CST 125FS plus Cruiser 5FS plus Temik 15G plus Vydate (9), and the variant A15422A (8) treatments than all other variant treatments. The two treatments containing Avicta, when combined, increased yields by an average of 186 pounds per acre while the two treatments with the addition of Temik 15G increased yields by an average of 494 pounds per acre. The combination treatment of Dynasty CST 125FS plus Cruiser 5FS plus Temik 15G plus Vydate produced the greatest yields at 593 pounds per acre over the control.

Evaluation of Avicta Variants on Reniform Populations and Seed Cotton Yield in Central Alabama

Treatment	Rate/seed	Stand [1]	–*Meloidogyne incognita* per 150 cc soil– 30 DAP [2]	Gall index [3]	Seed cotton *lb/ac*
1 Dynasty CST 125FS + Cruiser 5 FS	0.34 + 0.03	87.4 ab	46.40 abc	4.4 a	2474 bc
2 Dynasty CST 125FS + Cruiser 5 FS + Avicta	0.34 + 0.03 + 0.15	83.2 ab	46.40 abc	3.6 ab	2451 bcd
3 A14905B	0.54	81.0 b	36.10 abc	2.6 c	2254 cd
4 A14905E	0.54	90.8 a	61.80 ab	3.0 bc	2271 cd
5 A14905F	0.54	82.6 ab	25.78 bc	3.2 bc	2439 bcd
6 A14905G	0.54	85.6 ab	72.10 a	3.4 bc	2300 cd
7 A14905H	0.54	83.0 ab	36.01 abc	3.0 bc	1946 c
8 A15422A	0.54	85.6 ab	25.80 bc	3.6 ab	2608 abc
9 Dynasty CST 125FS + Cruiser 5 FS + Temik 15 G + Vydate	0.34 + 0.03 5 lb/ac + 17 oz/ac	78.8 b	25.80 bc	3.8 ab	3067 a
10 Dynasty CST 125FS + Cruiser 5 FS + Avicta Temik 15 G	0.34 + 0.03 +0.15 5 lb/ac	84.8ab	20.6 c	3.0 bc	2869 ab
LSD P≤0.05		**9.3**	**39.8**	**0.95**	**517**

[1] Plant stand was based on number of seedlings per 25 feet of row.
[2] DAP = days after planting.
[3] Root galling index: 0 = no galls; 1 = 1-3 galls, 2=4-10 galls, 3 = 11-25 galls, 4 = 26-100 galls, and 5 > 100 galls.
Column numbers followed by the same letter are not significantly different according to Fishers least significant difference test at ($P \leq 0.05$).

EVALUATION OF INHIBIT AND PROACT FOR RENIFORM NEMATODE MANAGEMENT IN COTTON IN NORTH ALABAMA, 2006

K. S. Lawrence, T. B. Hatchett, C. H. Burmester, G. W. Lawrence, and B. E. Norris

InHibit and ProAct were evaluated for the management of reniform nematodes in a naturally infested producer's field near the Tennessee Valley Research and Extension Center in Belle Mina, Alabama. The field had a history of reniform nematode infestation and the soil type was a Decatur silty loam. Avicta, Dynasty, and Cruiser were applied to the seed by the manufacturer. InHibit was added to the seed in a water drench and allow to air dry before planting. Temik 15G (5 pounds per acre) was applied at planting on May 16 in the seed furrow with chemical granular applicators attached to the planter. ProAct was applied as a foliar spray at the two to five true leaf plant growth stage with a two-row, CO_2-charged, back-pack sprayer. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrip control. Plots consisted of two rows, 25 feet long, with a 40-inch row spacing and were arranged in a randomized complete block design with five replications. Blocks were separated by a 20-foot alley. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the reniform nematode were determined at 28, 76, and 130 days after planting (DAP). Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the two rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 3. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode pressure was moderate in 2006 in north Alabama. Rainfall was limited to 11.2 inches for the first 6 weeks after planting. Reniform nematode numbers at planting averaged 2764 vermiform life stages per 150 cc of soil at planting. Cotton seedling stand was similar between all treatments with an adequate stand of three plants per 36 inches of row. At 28 DAP reniform numbers had increased above the planting level in four of the treatments. By 77 DAP, reniform numbers had not increased due to the drought and no differences ($P \leq 0.05$) in population numbers were observed between any treatments. At harvest at 133 DAP, all populations had dropped below the pre-plant levels observed in May. Seed cotton yields varied by 293 pounds per acre at harvest with an average of 2202 pounds per acre of seed cotton produced over all nematicides. Yields averaged 2108 pounds per acre over the InHibit plus ProAct treatments, 2112 pounds per acre in the Avicta seed treatment, and 2282 pounds per acre in the Temik 15G granular treatments. The Temik 15 G treatment alone increased seed cotton yield ($P \leq 0.05$) as compared to Avicta plus InHibit plus ProAct although, neither of these treatments was different from the Dynasty plus Cruiser control.

EFFECTS OF INHIBIT AND PROACT ON RENIFORM POPULATIONS AND SEED COTTON YIELD IN NORTH ALABAMA

Treatment	Rate	Application	Stand [1]	–*R. reniformis* per 150 cc soil– 28 DAP [2]	77 DAP	133 DAP	Seed cotton *lb/ac*
1 Dynasty + Cruiser	0.34 + 0.03 mg ai/seed	seed	77.4	5485	2369	726 b	2285 ab
2 Avicta	32 g/100 kg seed + 0.34 + 0.15 mg/seed	seed	71.2	3971	1931	2240 a	2231 ab
3 Avicta + InHibit + ProAct	32 g/100 kg seed + 0.34 + 0.15 mg/seed +	seed + 2-5 leaf	71.8	4636	3353	1097 ab	1992 b
4 Temik 15G	5 lb/ac	IF [3]	76.0	2240	1329	1447 ab	2454 a
5 Temik 15G + InHibit + ProAct	5 lb/ac	seed + IF + 2-5 leaf	77.2	2905	2256	988 b	2110 ab
6 InHibit + ProAct	5 lb/ac	seed + 2-5 leaf	75.4	2688	2318	1282 ab	2222 ab
LSD P=0.05			**11.4**	**3281**	**3182**	**1218**	**401**

[1] Plant stand was based on number of seedlings per 25 feet of row.
[2] DAP = days after planting.
[3] IF = in furrow.
Column numbers followed by the same letter are not significantly different according to Fishers least significant difference test at ($P \leq 0.05$).

EVALUATION OF AVICTA ALONE AND IN COMBINATION WITH SEED TREATMENT FUNGICIDES FOR PROTECTION OF COTTON FROM FUSARIUM WILT, 2006

K. S. Lawrence, T. B. Hatchett, and S. Nightengale

The seed treatments combinations Apron XL 3 LS plus Maxim 4 FS plus Systhane 40 WP plus Cruiser 5 FS plus Dynasty CST 125 FS plus Avicta 4.17 FS, and Argent 30 2.7 FS, Bion 50 WG, and A15418 were evaluated for the management of the Fusarium wilt/root-knot nematode disease complex in a naturally infested field at the Plant Breeding Unit of the E. V. Smith Research Center near Shorter, Alabama. The field had a history of root-knot nematode infestation and the soil type was a Marvyn sandy loam. Avicta was applied to the seed by the manufacturer. Temik 15G (5 pounds per acre) was applied at planting on April 20 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of two rows, 25 feet long, with a 40-inch row spacing and were arranged in a randomized complete block design with five replications. Blocks were separated by a 20-foot alley. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the root-knot nematode were determined at 40, 80, and 135 days after planting (DAP). Ten soil cores, 2.45 cm diameter and 20 cm deep were collected from the center rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 6. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Root-knot nematode pressure was moderate in 2006 in central Alabama due to drought conditions during the growing season. Root-knot nematode numbers at planting averaged 216 second stage juvenile life forms per 150 cc of soil. Cotton seedling stand at 30 DAP was similar between all seed treatments. Fusarium wilt disease incidence at mid season was severe and ranged from a high of 38.3 to a low of 25.8. No fungicide treatment reduced ($P \leq 0.05$) Fusarium wilt as compared to the Cruiser control. At 30 DAP, root-knot numbers had decreased an average of 94 percent over all treatments. The root galling index rating from the seed treatment Apron plus Maxim plus Systhane plus Cruiser plus Dynasty plus Systhane alone (8) and combined with Avicta (2) or A15418 (6) had fewer root galls as compared to Cruiser 5FS (1) control when taken at mid season. Seed cotton yields varied by 674 pounds per acre with an average increase of 135 pounds per acre over all seed treatments as compared to the Cruiser 5 FS control. The four seed treatment combinations containing Avicta (2, 3, 4, and 5), when combined, increased yields by an average of 189 pounds per acre while the treatment with the addition of Temik 15G increased yields by 453 pounds per acre.

EFFECT OF AVICTA IN COMBINATION WITH SEED TREATMENTS ON FUSARIUM WILT, SEED COTTON YIELD, AND ROOT-KNOT NEMATODE

Treatment/Product	Rate/seed	Rate unit	Stand [1]	Fusarium wilt index [2]	Seed cotton lb/ac	—*Meloidogyne incognita* /150 cm^3 soil— 30 DAP [3]	130 DAP	Galling[4]
1 Cruiser 5 FS	0.34	mg/seed	71.0	25.0	1196 bc	15.2	139.1 ab	5.0 a
2 Apron XL 3 LS + Maxim 4 FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	75.0	31.8	1318 abc	20.6	185.4 ab	2.6 c
Cruiser 5 FS +Dynasty CST 125 FS +	0.34 + 0.03 + 0.15	mg/seed						
Avicta 4.17 FS + Systhane 40 WP	0.019	mg/seed						
3 Apron XL 3 LS + Maxim 4 FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	70.0	25.8	1371 ab	20.6	185.4 ab	4.2 ab
Cruiser 5 FS +Dynasty CST 125 FS + Avicta 4.17 FS	0.34 + 0.03 + 0.15	mg/seed						
+ Systhane 40 WP + Dividend 0.15 FS	+ 0.019 + 0.005	mg/seed						
4 Apron XL 3 LS + Maxim 4 FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	69.4	31.4	1528 ab	15.5	236.9 a	4.2 ab
Cruiser 5 FS +Dynasty CST 125 FS + Avicta 4.17 FS	0.34 + 0.03 + 0.15	mg/seed						
+ Systhane 40 WP + Argent 30 2.7 FS	+ 0.019 + 0.009	mg/seed						
5 Apron XL 3 LS + Maxim 4 FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	73.0	32.1	1324 abc	5.2	82.4 b	4.2 ab
Cruiser 5 FS +Dynasty CST 125 FS + Avicta 4.17 FS	0.34 + 0.03 + 0.15	mg/seed						
+ Systhane 40 WP + Bion 50 WG	+ 0.019 + 0.002	mg/seed						
6 Apron XL 3 LS + Maxim 4 FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	60.6	38.3	953 c	10.3	144.2 ab	3.4 bc
Cruiser 5 FS +Dynasty CST 125 FS + Avicta 4.17 FS	0.34 + 0.03 + 0.15	mg/seed						
+ Systhane 40 WP + A15418	+ 0.019 + 0.014	mg/seed						
7 Apron XL 3 LS + Maxim 4 FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	67.8	26.4	1650 a	15.5	144.2 ab	4.2 ab
Temik 15 G (5l b/a)	860	kg/ha						
8 Apron XL 3 LS + Maxim 4 FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	75.6	30.7	1179 bc	15.5	133.9 ab	3.8 b
Cruiser 5 FS +Dynasty CST 125 FS + Systhane 40 WP	0.34 + 0.03 + .019	mg/seed						
LSD P=0.05			**15.9**	**26.0**	**410**	**17.4**	**142.4**	**1.0**

[1] Plant stand was based on number of seedlings per 25 feet of row.
[2] Fusarium wilt index: (Number of diseased plants/Number of healthy plants) x 100.
[3] DAP = days after planting.
[4] Root galling index: 0 = no galls; 1 = 1-3 galls, 2=4-10 galls, 3 = 11-25 galls, 4 = 26-100 galls, and 5 > 100 galls.
Column numbers followed by the same letter are not significantly different according to Fishers least significant difference test at ($P \leq 0.05$).

FUNGICIDES

EVALUATION OF QUADRIS 2.08SC FOR MANAGEMENT OF COTTON BOLL ROT DISEASE IN SOUTH ALABAMA, 2006

K. S. Lawrence, G. W. Lawrence, M. D. Pegues, and C. D. Monks

A Quadris 2.08SC fungicide trial was conducted at the Auburn University Gulf Coast Research and Extension Center, Fairhope, Alabama. The soil type was a Malbis fine sandy loam. Plots consisted of four rows, 30 feet long, with a 38-inch row spacing. Plots were arranged in a randomized complete-block design with five replications. A 20-foot alley separated blocks. Deltapine DP 555 BG/RR, a full season variety was planted on May 3 at a rate of four seed per foot of row. All fungicides applications were applied as a foliar spray with a CO_2-charged, back-pack system using a two-row four-nozzle boom equipped with 8002 flat fan nozzles positioned on both sides of the row calibrated to deliver 10 gallons per acre at 25 psi. Cotton boll rot was evaluated by recording the number of healthy bolls and diseased bolls from a 0.001 acre section within each plot. Disease index (number of diseased bolls / total number of healthy counted) × 100 was calculated for each variety on September 16. Plots were harvested on September 16. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Data were statistically analyzed using PROC GLM, and means were compared with Fisher's protected least significant difference test ($P \leq 0.05$).

Cotton boll rot disease incidence was moderate in 2006 due to the low amount of rainfall during June and July. The amount of boll rot recorded immediately before harvest was not difference between the control and the Quadris 2.08SC treatments. However, the incidence of hard lock was reduced ($P \leq 0.05$) by the double application of Quadris 2.08SC applied at 6.2 fluid ounces per acre as compared to the control. Seed cotton yields varied by 128.4 pounds per acre between Quadris 2.08SC applied two times as compared to the control treatment. The Quadris 2.08SC treatments applied twice at the low rate or once at the higher rate numerically increased yields an average of 105 pounds per acre as compared to the control.

EFFECT OF QUADRIS ON COTTON BOLL ROT, HARD LOCK, AND YIELD

Fungicide	Rate	Timing	Disease index[1] Sept. 16	Hard lock index[2] Sept. 16	Seed cotton *lb/ac* Sept. 20	Yield control *over lb*
Control			8.0	7.2 a	2374.5	
Quadris 2.08SC	6.2 fl oz/ac	50% bloom	5.5	4.9 ab	2255.5	-119.0
Quadris 2.08SC	9.2 fl oz/ac	50% bloom	6.5	5.3 ab	2457.0	82.5
Quadris 2.08SC	6.2 fl oz/ac	50% bloom + 14 days	5.2	3.6 b	2502.9	128.4
LSD ($P \leq 0.05$)			**3.7**	**3.5**	**269.4**	

[1]Disease index = (number of diseased bolls / total number of healthy bolls) × 100.
[2]Hard lock index = (number of hard lock bolls / total number of healthy bolls) × 100.
Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

Evaluation of Topsin M for Management of Cotton Boll Rot Disease in South Alabama, 2006

K. S. Lawrence, G. W. Lawrence, M. D. Pegues, and C. D. Monks

A Topsin M fungicide trial was conducted at the Auburn University Gulf Coast Research and Extension Center, Fairhope, Alabama. The soil type was a Malbis fine sandy loam. Plots consisted of four rows, 30 feet long, with a 38-inch row spacing. Plots were arranged in a randomized complete-block design with five replications. A 20-foot alley separated blocks. Deltapine DP 555 BG/RR, a full season variety was planted on May 3 at a rate of four seed per foot of row. All fungicides applications were applied as a foliar spray with a CO_2-charged, back-pack system using a two-row four-nozzle boom equipped with 8002 flat fan nozzles positioned on both sides of the row calibrated to deliver 10 gallons per acre at 25 psi. Cotton boll rot was evaluated by recording the number of healthy bolls and diseased bolls from a 0.001 acre section within each plot. Disease index (number of diseased bolls / total number of healthy counted) × 100 was calculated for each variety on September 16. Plots were harvested on September 16. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Data were statistically analyzed using PROC GLM, and means were compared with Fisher's protected least significant difference test ($P \leq 0.05$).

Cotton boll rot disease incidence was moderate in 2006 due to the low amount of rainfall during June and July. The amount of boll rot and hard lock recorded immediately before harvest was not different between the control and the Topsin M treatments applied two, three, and four times. Both disease incidences measurement were numerically higher for the control treatment as compared to the Topsin M treatments. Seed cotton yields increased by 375.9 pounds per acre for Topsin M applied three times as compared to the control treatment. All Topsin M treatments applied bi-weekly increased yield numerically as compared to the control. The addition of Folicur to Topsin M applied three times did not further reduce boll rot or hard lock incidence or increase yield as compared to the Topsin M three-application treatment.

Effect of Topsin M on Cotton Boll Rot, Hard Lock, and Yield

Fungicide	Rate	Timing	Disease index[1] Sept. 16	Hard lock index[2] Sept. 16	Seed cotton *lb/ac* Sept. 20	Yield control *over lb*
Control			7.4 a	6.2 a	2503 b	
Topsin M 4.5 F	16 fl oz/ac	50% bloom	4.9 a	4.5 a	2686 ab	183.3
Topsin M 4.5 F	16 fl oz/ac	50% bloom + 14 days	5.0 a	3.8 a	2650 ab	146.7
Topsin M 4.5 F	16 fl oz/Aac	50% bloom + 14 + 28 days	5.3 a	3.3 a	2879 a	375.9
Topsin M 4.5 F + Folicur 3.6 F	16 fl oz/ac + 4 fl oz/ac	50% bloom + 14 + 28 days	4.3 a	2.7 a	2732 ab	229.2
LSD ($P \leq 0.05$)			**5.3**	**4.7**	**285**	

[1]Disease index = (number of diseased bolls / total number of healthy bolls) × 100.
[2]Hard lock index = (number of hard lock bolls / total number of healthy bolls) × 100.
Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

Effect of Selected Seed Treatments on Cotton Seedling Disease in North Alabama, 2006

K. S. Lawrence, T. B. Hatchett, C. H Burmester, and B. E. Norris

Selected fungicides were evaluated for the management of cotton seedling disease in north Alabama. The field had a history of seedling disease and the soil type was a Decatur silt loam. Soil was 70 degrees F at a 4-inch depth at 10 a.m. with adequate moisture at planting. All seed treatments were applied by the manufacturer. Temik 15G at 5 pounds per acre was applied at planting on April 17 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrip control. Plots consisted of 4 rows 30 feet long with 40-inch row spacing and were arranged in a randomized complete block design with four replications. Blocks were separated by a 20-foot alley. Standard herbicides, insecticides, and fertility production practices as recommended by the Alabama Cooperative Extension System were used throughout the season. Stand counts and skip index ratings were recorded at 2 and 4 weeks after planting to determine the percent seedling loss and stand density due to cotton seedling disease. Plots were harvested on September 8. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Seedling disease pressure was moderate for the cotton planted in mid April. Cotton seedling stand was increased by the RTU Baytan Thiram/Allegiance plus Trilex/ Vortex/Allegiance/Baytan as compared to the black seed control at 14 days after planting (DAP). By 28 DAP all fungicide seed treatments increased stand over the black seed control. The additional seed treatments Trilex/ Vortex/Allegiance/Baytan, Trilex/Allegiance/Baytan, and Dynasty CST increased stand as compared to the seed treatment standard RTU Baytan Thiram/ Allegiance at 28 DAP. The uniformity of the seedling stand as measured by the skip index was better in the RTU Baytan Thiram/ Allegiance alone or with Trilex/ Vortex/Allegiance/Baytan, or Trilex/Allegiance/Baytan. Seed cotton yields varied by 430 pounds per acre over all treatments. The seed treatments increased yield by an average of 267 pounds per acre while the addition of TSX increased yield by 227.6 pounds per acre.

Effect of Selected Seed Treatments on Stand, Skip Index, and Yield in North Alabama

Treatment	Rate	Appl	Stand/25 ft. row [1]		Skip index [3]	Seed cotton
			14 DAP [2]	28 DAP	28 DAP	*lb/ac*
1 RTU Baytan Thiram/ Allegiance	3.0 + 0.75 oz/cwt	seed	97.2 ab	80.0 b	1.6 bc	2968.9 bc
2 TRT 1 + Trilex/ Vortex/ Allegiance/Baytan	0.64 + 0.08 + 0.75 + 0.25 oz/cwt	seed	110.8 a	101.0 a	0.2 c	3255.6 a
3 TRT 1 + Trilex/Allegiance/ Baytan	0.64 + 0.75 + 0.25 oz/cwt	seed	100.8 ab	103.6 a	1.0 bc	3041.2 abc
4 TRT 1 + Dynasty CST	3.95 oz/cwt	seed	105.6 ab	96.4 a	2.0 ab	3104.5 ab
5 Untreated black seed			91.4 b	66.0 c	3.2 a	2825.5 c
6 TRT 1 + TSX 18.8G	5.5 lb/ac	Infurrow	98.2 ab	90.2 ab	1.8 ab	3053.1 abc
LSD (0.05)			**16.4**	**13.8**	**1.6**	**257.3**

[1] Plant stand was based on the number of seedlings per 25 feet of row. [2] DAP = days after planting.

[3] Skip index rating is equal to the footage of row greater than 1 foot not occupied by seedling.

Means within columns followed by different letters are significantly different according to Fisher's LSD ($P < 0.05$).

Evaluation of Avicta Variants on Early Season Diseases in Cotton in North Alabama, 2006

K. S. Lawrence, T. B. Hatchett, C. H. Burmester, and B. E. Norris

Avicta variants, A14905, B, E, F, G, H, and A15422A, were evaluated for the management of cotton seedling disease. The field had a history of seedling disease and the soil type was a Decatur silty loam. Soil was 68 degrees F at a 4-inch depth at 10 a. m. with adequate moisture at planting. All seed treatments were applied to the seed by the manufacturer. High disease pressure plots were innoculated with *Rhizoctonia solani;* low disease pressure plots were left alone. Temik 15G (5 pounds per acre) was applied at planting on April 12 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of two rows, 25 feet long, with a 40-inch row spacing and were arranged in a randomized complete block design with five replications. Blocks were separated by a 20-foot alley. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Stand counts and skip index ratings were recorded at 3 and 5 weeks after planting to determine the percent seedling loss and stand density due to cotton seedling disease. Plots were harvested on September 6. Data were statistically analyzed by GLM and means compared using Fishers protected least significant difference test ($P \leq 0.05$).

Seedling disease pressure was moderate to high in 2006 in north Alabama due to cool temperatures and weekly rain events during the last 2 weeks of April and first 2 weeks of May. Under natural conditions or low disease pressure, cotton seedling stand was increased by the Avicta (3) treatment and variants A14905B (6), A14905G (9), and A15422A (12) at 21 days after planting (DAP), and all fungicide seed treatments increased stand by 35 DAP. A lower skip index, indicating a more evenly spaced seedling stand, was observed in variant A14905B (6) and A14905E (7) as compared to the control. All the fungicide seed treatments produced similar yields as compared to the Cruiser control. Under high disease pressure, all seed treatments increased cotton stand as compared to the Cruiser control at 21 and 35 DAP. Plant survival was increased in variants A14905E (7), A14905G (9), and A14905H (11) as compared to the control and was equivalent to the standard fungicide seed treatments 2 and 3. A lower skip index, indicating a more evenly spaced seedling stand, was observed in all seed treatments as compared to the Cruiser control except for the Apron XL 3LS plus Maxim 4FS plus Systhane plus Temik 15 G (4) treatment combination. Seed cotton yields varied by 2136 pounds per acre with an average increase of 1891 pounds per acre over all treatments. Yields were ($P \leq 0.05$) higher in variants A14905B (6), A14905E (7), A14905F (8), and A14905G (9) as compared to the Cruiser control (1). These variants produced similar yields to the seed treatment standards in treatments 2 and 3.

EFFECT OF AVICTA VARIANTS ON STAND, SKIP INDEX, AND YIELD IN NORTH ALABAMA

Treatment	Rate/seed	Rate unit	Stand/25 ft. row[1] 21 DAP[2]	Stand/25 ft. row[1] 35 DAP	Skip index[3] 35 DAP	Seed cotton *lb/ac*
Low disease pressure						
1 Cruiser 5 FS	0.34	mg/seed	86 b	68.4 b	4.8 a	2660.5 abc
2 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + Dynasty CST 125FS + Systhane 40 WP +Cruiser	7.5 + 2.5 + 21 0.03 + 21 + 0.34	g/100 kg seed mg/seed	106 ab	91.4 a	3.4 abc	2704.9 abc
3 Apron XL 3LS + Maxim 4FS + Systhane 40 WP Cruiser 5 FS + Dynasty CST 125FS + Avicta 4.17 + Systhane 40 WP	7.5 + 2.5 + 21 0.34 + 0.03 + 0.15 + 21	g/100 kg seed mg/seed mg/seed	113.6 a	85.8 a	3 abc	2906.7 ab
4 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + Temik 15 G	7.5 + 2.5 + 21 + 840	g/100 kg seed g/ha	100 ab	93 a	4.2 ab	2866 abc
5 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + Dynasty CST 125 FS + Temik 15 G	7.5 + 2.5 + 21+ 0.03 + 840	g/100 kg seed g/ha	98 ab	90 a	3.8 abc	2955.8 a
6 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A14905B	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	116.2 a	82.4 a	0.8 c	2638.4 abc
7 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A14905E	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	105.2 ab	83.8 a	1 bc	2529.0 abc
8 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A14905F	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	103 ab	89.6 a	3.6 abc	2774.1abc
9 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A14905G	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	98.4 ab	91.6 a	3.4 abc	2643.6 abc
10 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A14905G	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	108.6 a	85.2 a	1.6 abc	2512.6 bc
11 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A14905H	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	105.6 ab	87 a	1.8 abc	2447.7 c
12 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A15422A	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	112.2 a	90.4 a	2.4 abc	2603.5 abc
LSD P=0.05			**21.9**	**11.2**	**3.2**	**442.0**
High disease pressure						
1 Cruiser 5 FS	0.34	mg/seed	11.4 e	8.2 e	21.4 a	574.5 f
2 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + Dynasty CST 125FS + Systhane 40 WP +Cruiser	7.5 + 2.5 + 21 0.03 + 21 + 0.34	g/100 kg seed mg/seed	63.4 abc	54.8 ab	8.4 de	2559.2 a-e
3 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + Cruiser 5 FS + Dynasty CST 125FS + Avicta 4.17 + Systhane 40 WP	7.5 + 2.5 + 21 0.34 + 0.03 + 0.15 + 21	g/100 kg seed mg/seed mg/seed	60.4 a-d	53.2abc	11.4 cd	2710.9 ab
4 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + Temik 15 G	7.5 + 2.5 + 21 + 840	g/100 kg seed g/ha	53.4 bcd	31.8 c	17.6 ab	2161.7 e
5 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + Dynasty CST 125 FS + Temik 15 G	7.5 + 2.5 + 21+ 0.03 + 840	g/100 kg seed g/ha	52.2 cd	41.6 cd	14.8 bc	2297.2 cde
6 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A14905B	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	52.4 cd	42 cd	11.2 cd	2415.2 a-e
7 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A14905E	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	66.6 ab	53.4 abc	7.6 de	2785.6 a
8 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A14905F	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	57.2 bcd	50.6 abc	10.6 cde	2699.4 abc
9 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A14905G	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	71.6 a	60.6 a	6.4 e	2596.5 a-d
10 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A14905G	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	49.4 c	46.6 bc	11.2 cd	2324.4b-e
11 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A14905H	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	61.8 a-d	54 ab	9.2 de	2351.9 b-e
12 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A15422A	7.5 + 2.5 + 21 + 0.54	g/100 kg seed mg/seed	57.6 bcd	41.6 cd	11 cd	2220.2 de
LSD P=0.05			**13.9**	**11.8**	**4.4**	**361.5**

[1] Plant stand was based on the number of seedlings per 25 feet of row. [2] DAP = days after planting [3] Skip index rating is equal to the footage of row greater than 1 foot not occupied by seedling. Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

Evaluation of Avicta Variants on Early Season Diseases and Reniform Nematode Management in Cotton in South Alabama, 2006

K. S. Lawrence, T. B. Hatchett, W. S. Gazaway, and J. R. Akridge

Avicta variants, A14905, B, E, F, G, H, and A15422A, were evaluated in combination with Apron XL 3LS plus Maxim 4FS plus Systhane 40 WP for the management of reniform nematodes in a naturally infested producer's field near Huxford, Alabama. The field had a history of reniform nematode infestation and the soil type was classified as a sandy loam. All seed treatments were applied to the seed by the manufacturer. Temik 15G (5 pounds per acre) was applied at planting on May 17 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of two rows, 25 feet long, with a 36-inch row spacing and were arranged in a randomized complete block design with six replications. Blocks were separated by a 20-foot alley. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Population densities of the reniform nematode were determined at 40, 80, and 135 days after planting (DAP). Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the center rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 9. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode pressure was moderate in 2006 in south Alabama. Reniform nematode numbers at planting averaged 2781 vermiform life stages per 150 cc of soil at planting. Cotton seedling stand was increased by nine of the 12 fungicide seed treatments (2-3, 6-12) as compared to the two treatments that contained Temik 15 G (4 and 5) (see table). At 40 DAP, reniform numbers had decreased in all treatments although none of the seed treatments reduced reniform populations more than the Cruiser control. However, by 84 DAP reniform numbers increased in all treatments. The lowest populations were recovered in the Apron XL 3LS plus Maxim 4FS plus Systhane 40 WP plus Cruiser 5 FS plus Dynasty CST 125FS plus Avicta 4.17 FS plus Systhane 40 WP (3). The highest populations were found in variants A14905H (11) and A15422A (12). By harvest at 135 DAP, all populations had decreased to levels below those found at planting. Seed cotton yields varied by 241 pounds per acre with an average of 1943 pounds per acre over all the Avicta variants treatments. Yields were higher ($P \leq 0.05$) in the Apron XL 3LS plus Maxim 4FS plus Systhane 40 WP plus A14905G (10) seed treatment combination as compared to the two seed treatment combinations Apron XL 3LS plus Maxim 4FS plus Systhane 40 WP plus or minus Dynasty CST 125 FS (4 and 5) with the in furrow Temik 15 G application at planting.

EFFECT OF AVICTA VARIANTS ON STAND, SKIP INDEX, AND YIELD IN SOUTH ALABAMA

Treatment	Rate/seed	Rate unit	Stand [1]	*Rotylenchulus reniformis* / 150 cc soil 40 DAP [2]	84 DAP	135 DAP	Seed cotton *lb/ac*
1 Cruiser 5 FS	0.34	mg/seed	74 cd	948.1 b	4751 bc	1605 a	1931 ab
2 Apron XL 3LS + Maxim 4FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	85 abc	1429.1 ab	3348 c	523 bc	1915 ab
Dynasty CST 125FS + Systhane 40 WP +Cruiser 5 FS	0.03 + 21 + 0.34	mg/seed					
3 Apron XL 3LS + Maxim 4FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	70 de	1274.6ab	2678 c	1051 abc	1973 ab
Cruiser 5 FS + Dynasty CST 125FS + Avicta 4.17 FS + Systhane 40 WP	0.34 + 0.03 + 0.15 + 21	mg/seed mg/seed					
4 Apron XL 3LS + Maxim 4FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	59 e	914.1 b	4481 bc	523 bc	1820 b
Temik 15 G	840	g/ha					
5 Apron XL 3LS + Maxim 4FS + Systhane 40 WP +	7.5 + 2.5 + 21+ .03	g/100 kg seed	59 e	1403.4 ab	3708 bc	897 abc	1822 b
Dynasty CST 125 FS + Temik 15 G	840	g/ha					
6 Apron XL 3LS + Maxim 4FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	87 ab	2562.1 a	5871 abc	1343 ab	1913 ab
A14905B	0.54	mg/seed					
7 Apron XL 3LS + Maxim 4FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	85 abc	1596.5 ab	3322 c	987 abc	1962 ab
A14905E	0.54	mg/seed					
8 Apron XL 3LS + Maxim 4FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	72 d	708.1 b	4918 abc	557 bc	1908 ab
A14905F	0.54	mg/seed					
9 Apron XL 3LS + Maxim 4FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	90 a	978.5 b	2884 c	742 abc	2006 ab
A14905G	0.54	mg/seed					
10 Apron XL 3LS + Maxim 4FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	87 ab	1789.6 ab	6940 abc	678 bc	2061 a
A14905G	0.54	mg/seed					
11 Apron XL 3LS + Maxim 4FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	77 bcd	1133 ab	10377ab	648 bc	2000 ab
A14905H	0.54	mg/seed					
12 Apron XL 3LS + Maxim 4FS + Systhane 40 WP	7.5 + 2.5 + 21	g/100 kg seed	76 bcd	2278.9 ab	11635 a	231 c	1874 ab
A15422A	0.54	mg/seed					
LSD P<0.05			**13**	**1577.6**	**6737.5**	**885.1**	**216**

[1] Plant stand was based on the number of seedlings per 25 feet of row. [2] DAP = days after planting.

Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

Efficacy of Base Fungicide Combinations on Cotton Seedling Disease in Central Alabama, 2006

T. B. Hatchett, K. S. Lawrence, and B. Durbin

Avicta variants, A15436, A, B, C, and A14905B, were evaluated for the management of cotton seedling disease. The field had a history of seedling disease and the soil type was a Marvyn sandy loam. Soil was 68 degrees F at 9.8 cm. depth at 10 a.m. with adequate moisture at planting. All seed treatments were applied by the manufacturer. High disease incidence plots were infested with millet seed inoculated with *Pythium ultimum* and *Rhizoctonia solani*. Temik 15G at 5 pounds per acre was applied at planting on April 17 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of four rows 25 feet long with 40-inch row spacing and were arranged in a randomized complete block design with four replications. Blocks were separated by a 3.05-m alley. Standard herbicides, insecticides, and fertility production practices as recommended by the Alabama Cooperative Extension System were used throughout the season. Stand counts and skip index ratings were recorded at 21 and 35 days after planting (DAP) to determine the percent seedling loss and stand density due to cotton seedling disease. Plots were harvested on September 8. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P < 0.05$).

Seedling disease pressure was moderate in 2006 when cotton was planted early. Under low disease pressure all treatments were statistically equivalent in stand, skip index, and yield when compared to the Cruiser control. Although seed cotton yields varied by an average of 674 pounds per acre, no fungicide treatment was statistically greater than the Cruiser control. Under high disease pressure, cotton seedling stand was increased by the Allegiance/Baytan/Argent (4), A15436A (10), A15436B (11), and A15436C (12) at 21 DAP. The Allegiance/Baytan/Argent (4), A15436A (10), and A15436B (11) continued to have significantly higher stand counts at 35 DAP. A numeric increase in seed cotton yield was observed with Apron/Maxim/Systhane/Dynasty/Cruiser (9), A15436A (10), A15436B (11), and A15436C (12) when compared to the Cruiser control (1). The addition of Apron produced an average numerical yield increase of 667 pounds per acre. The Avicta variants (5, 6, and 7) produced an average numerical increase of 341 pounds per acre.

EFFICACY OF BASE FUNGICIDES ON STAND, SKIP INDEX, AND YIELD IN SOUTH ALABAMA

Treatment	Rate/seed	Rate unit	Stand [1] 21 DAP [2]	Stand [1] 35 DAP	Skip index [3] 35 DAP	Seed cotton *lb/ac*
	Low disease pressure					
1 Cruiser 5 FS	0.34	mg/seed	61.7 ab	47.0 abc	7..2 abc	2619 abc
2 Apron XL 3LS + Maxim 4FS +	7.5 + 2.5 + 21 +	g/100 kg seed	52.5 ab	50.5 abc	8..5 abc	2842 abc
Systhane 40 WP +Cruiser 5 FS	0.34	mg/seed				
3 Allegiance-LS + RTU-Baytan-Thiram 1.76 FS +	15.0 +41.0 +	g/100 kg seed	48.5 ab	40.0 abc	8..5 abc	2614 bc
Cruiser 5 FS	0.34	mg/seed				
4. Allegiance-LS + Baytan 30 +Argent 30 +	15.0 +10.0 + 21.0 +	g/100 kg seed	46.7 ab	38.2 bc	6.7 abc	2725 abc
Cruiser 5 FS	0.34	g/ha				
5 A15436A +	31 +	g/100 kg seed	69.7 ab	59.7 a	5.7 c	2965 abc
Cruiser 5 FS	0.34	g/ha				
6 A14905B +	31 +	g/100 kg seed	38.2 b	30.5 c	11.2 a	2423 c
Cruiser 5 FS	0.34	mg/seed				
7 A15436C +	0.34 +	g/100 kg seed	58.2 ab	45.5 abc	8.0 abc	2785 abc
Cruiser 5 FS	31	mg/seed				
8 Dynasty .83 FS +	0.03 +	g/100 kg seed	61.5 ab	52.2 ab	6.2 bc	3188 a
Cruiser 5 FS	31	mg/seed				
9 Apron XL 3LS + Maxim 4FS + Systhane 40 WP +	7.5 + 2.5 + 21 +	g/100 kg seed	57.5 ab	40.0 abc	6.7 abc	2842 abc
Dynasty .83 FS + Cruiser 5 FS	0.03 + 0.34	mg/seed				
10 Apron XL 3LS + Maxim 4FS + Systhane 40 WP +	7.5 + 2.5 + 21 + 26 +	g/100 kg seed	56.2 ab	44.0 abc	6.5 bc	3060 ab
+ A15436A +Cruiser 5 FS	0.34	mg/seed				
11 Apron XL 3LS + Maxim 4FS +	7.5 + 2.5 + 21 + 26 +	g/100 kg seed	68.2 a	54.0 ab	4.2 c	2529 bc
Systhane 40 WP + A15436B + Cruiser 5 FS	0.34	mg/seed				
12 Apron XL 3LS + Maxim 4FS + Systhane 40 WP+	7.5 + 2.5 + 21 + 26 +	g/100 kg seed	48.7 ab	40.7 abc	10.5 ab	3063 ab
A15436C +Cruiser 5 FS	0.34	mg/seed				
LSD P=0.05			**25**	**20.8**	**4.6**	**571**

continued

[1] Plant stand was based on the number of seedlings per 25 feet of row. [2] DAP = days after planting.
[3] Skip Index rating is equal to the footage of row greater than 1 foot not occupied by seedling.
Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

Efficacy of Base Fungicides on Stand, Skip Index, and Yield in South Alabama, Continued

Treatment	Rate	Rate unit	Stand[1] 21 DAP[2]	Stand[1] 35 DAP	Skip index[3] 35 DAP	Seed cotton lb/ac
High disease pressure						
1 Cruiser 5 FS	0.34	mg/seed	7.75 c	6..5 c	19.5 ab	1168 c
2 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + Cruiser 5 FS	7.5 + 2.5 + 21 + 0.34	g/100 kg seed mg/seed	13.2 bc	12.5 bc	20.0 ab	1353 bc
3 Allegiance-LS + RTU-Baytan-Thiram 1.76 FS + Cruiser 5 FS	15.0 +41.0 + 0.34	g/100 kg seed mg/seed	15.2 bc	13.0 bc	17.5 ab	1655 abc
4 Allegiance-LS + Baytan 30 +Argent 30 + Cruiser 5 FS	15.0 +10.0 + 21.0 + 0.34	g/100 kg seed g/ha	23.5 ab	18.2 ab	17.5 ab	1737 abc
5 A15436A + Cruiser 5 FS	31 + 0.34	g/100 kg seed g/ha	12.7 bc	10.2 bc	16.7 ab	1334 bc
6 A14905B + Cruiser 5 FS	31 + 0.34	g/100 kg seed mg/seed	10.7 bc	10.2 bc	20.2 ab	1457 abc
7 A15436C + Cruiser 5 FS	0.34 + 31	g/100 kg seed mg/seed	13.7 bc	12.5 bc	21.0 a	1552 abc
8 Dynasty .83 FS + Cruiser 5 FS	0.03 + 31	g/100 kg seed mg/seed	18.7 abc	13.5 bc	20.2 ab	1587 abc
9 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + Dynasty .83 FS + Cruiser 5 FS	7.5 + 2.5 + 21+ 0.03 + 0.34	g/100 kg seed mg/seed	14.7 bc	12.0 bc	19.7 ab	1914 ab
10 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A15436A + Cruiser 5 FS	7.5 + 2.5 + 21 + 26 + 0.34	g/100 kg seed mg/seed	21.2 ab	17.7 ab	17.5 ab	2039 a
11 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A15436B + Cruiser 5 FS	7.5 + 2.5 + 21 + 26 + 0.34	g/100 kg seed mg/seed	23.5 ab	25.0 a	15.7 b	2028 a
12 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A15436C + Cruiser 5 FS	7.5 + 2.5 + 21 + 26 + 0.34	g/100 kg seed mg/seed	28.2 a	17.0 abc	19.7 ab	1838 ab
LSD P=0.05			**12.9**	**10.6**	**4.7**	**620**

[1] Plant stand was based on the number of seedlings per 25 feet of row. [2] DAP = days after planting.

[3] Skip Index rating is equal to the footage of row greater than 1 foot not occupied by seedling.

Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

Efficacy of Base Fungicide Combinations on Cotton Seedling Disease in North Alabama 2006

T. B. Hatchett, K. S. Lawrence, C. H. Burmester, and B. E. Norris

Selected base fungicides were evaluated to determine their efficacy against early season cotton disease in north Alabama. The field had a history of seedling disease and the soil type was a Decatur silty loam. Soil was 21.7 degrees C at a 9.8-cm depth at 10 a.m. with adequate moisture at planting on May 5. All seed treatments were applied to the seed by the manufacturer. High disease incidence plots were infested with millet seed inoculated with *Pythium ultimum* and *Rhizoctonia solani*. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrip control. Plots consisted of four rows 25 feet long with 40-inch row spacing and were arranged in a randomized complete block design with five replications. Blocks were separated by 6.1 m alleys. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Stand counts and skip index ratings were recorded at 21 and 35 days after planting (DAP) to determine the percent seedling loss and stand density due to cotton seedling disease. Plots were harvested on September 9. Data was statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Seedling disease pressure was moderate to high in 2006 in north Alabama due to cool temperatures and weekly rain events during the last 2 weeks of April and first 2 weeks of May. Under natural conditions or low disease pressure, cotton seedling stand was increased by Allegiance/Baytan/Argent/Cruiser (4), Dynasty/Cruiser (8), and Apron/Maxim/Systhane/Dynasty/Cruiser (9) 35 DAP compared to the Cruiser control (1). No significant difference was found among the different fungicide combinations for skip index. All fungicides produced similar yields compared to the Cruiser control. Under high disease pressure, all seed treatments increased cotton stand as compared to the Cruiser control 21 and 35 DAP. A lower skip index, indicating a more evenly spaced seedling stand, was observed in seed treatments Allegiance/Baytan/Argent/Cruiser (4), A14905B (6), A15436C (7), Apron/Maxim/Systhane/Dynasty/Cruiser (9), A15436A (10), A15436B (11), and A15436C (12). Seed cotton yields varied by 1364 pounds per acre over all treatments. All seed treatment fungicide combinations resulted in higher yields compared to the Cruiser control (1). The addition of Apron produced an average yield increase of 1053 pounds per acre. The Avicta variants (5, 6, and 7) produced an average increase of 888 pounds per acre.

EFFICACY OF BASE FUNGICIDE COMBINATIONS ON STAND, SKIP INDEX, AND YIELD IN NORTH ALABAMA

Treatment	Rate unit	Application	Stand [1] 21 DAP [2]	Stand [1] 35 DAP	Skip index [3] 35 DAP	Seed cotton lb/ac
Low disease pressure						
1 Cruiser 5 FS	0.34	mg/seed	91.2	79.8 c	2.4 abc	2912 ab
2 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + Cruiser 5 FS	7.5 + 2.5 + 21 + 0.34	g/100 kg seed mg/seed	91.6	89 abc	2.2 abc	2976 a
3 Allegiance-LS + RTU-Baytan-Thiram 1.76 FS + Cruiser 5 FS	15.0 + 41.0 0.34	g/100 kg seed mg/seed	86.2	80.6 bc	3.6 a	2843 ab
4 Allegiance-LS + Baytan 30 +Argent 30 + Cruiser 5 FS	15 +10 + 21 + 0.34	g/100 kg seed g/ha	106.8	98.2 a	0.8 c	2974 a
5 A15436A + Cruiser 5 FS	31 + 0.34	g/100 kg seed g/ha	97.2	89.4 abc	1.6 bc	3003 a
6 A14905B + Cruiser 5 FS	31 + 0.34	g/100 kg seed mg/seed	99.4	90.4 abc	1.8 abc	2898 ab
7 A15436C + Cruiser 5 FS	0.34 + 31	g/100 kg seed mg/seed	93.0	90.8 abc	1.6 bc	2772 ab
8 Dynasty .83 FS + Cruiser 5 FS	0.03 + 31	g/100 kg seed mg/seed	98.0	93.8 ab	1.8 abc	2752 ab
9 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + Dynasty .83 FS + Cruiser 5 FS	7.5 + 2.5 + 21+ 0.03 + 0.34	g/100 kg seed mg/seed	104.2	93.6 ab	1.2 bc	2507 ab
10 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A15436A +Cruiser 5 FS	7.5 + 2.5 + 21 + 26 + 0.34	g/100 kg seed mg/seed	90.4	82 bc	2.4 abc	2693 ab
11 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A15436B + Cruiser 5 FS	7.5 + 2.5 + 21 + 26 + 0.34	g/100 kg seed mg/seed	81.0	83.8 bc	2.8 ab	2718 ab
12 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A15436B + Cruiser 5 FS	7.5 + 2.5 + 21 + 26 + 0.34	g/100 kg seed mg/seed	103.0	83.6 bc	1 c	2694 b
LSD P=0.05			**27.0**	**13.6**	**1.8**	**415**
High disease pressure						
1 Cruiser 5 FS	0.34	mg/seed	11.4 d	9.2 e	20.6 a	910 d
2 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + Cruiser 5 FS	7.5 + 2.5 + 21 + 0.34	g/100 kg seed mg/seed	48.2 bc	26.8 cd	17.6 ab	1590 c
3 Allegiance-LS + RTU-Baytan-Thiram 1.76 FS + Cruiser 5 FS	15.0 + 41.0 0.34	g/100 kg seed mg/seed	50.0 abc	31.0 bcd	15.6 abc	2274 bc
4 Allegiance-LS + Baytan 30 + Argent 30 + Cruiser 5 FS	15 +10 + 21 + 0.34	g/100 kg seed g/ha	52.6 abc	35.4 bcd	14.4 bcd	1752 bc
5 A15436A + Cruiser 5 FS	31 + 0.34	g/100 kg seed g/ha	43.4 c	24.8 de	18.2 ab	1659 bc
6 A14905B + Cruiser 5 FS	31 + 0.34	g/100 kg seed mg/seed	57.0 abc	41.6 bc	12.8 bcd	1851 bc
7 A15436C + Cruiser 5 FS	0.34 + 31	g/100 kg seed mg/seed	66.8 ab	46.2 b	12.0 cd	1884 abc
8 Dynasty .83 FS + Cruiser 5 FS	0.03 + 31	g/100 kg seed mg/seed	43.4 c	30.2 bcd	15.2 abc	1656 bc
9 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + Dynasty .83 FS + Cruiser 5 FS	7.5 + 2.5 + 21+ 0.03 + 0.34	g/100 kg seed mg/seed	69.8 a	64.0 a	9.4 d	2274 a
10 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A15436A + Cruiser 5 FS	7.5 + 2.5 + 21 + 26 + 0.34	g/100 kg seed mg/seed	61.0 abc	39.2 bcd	12.0 cd	2052 ab
11 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A15436A + Cruiser 5 FS	7.5 + 2.5 + 21 + 26 + 0.34	g/100 kg seed mg/seed	52.6 abc	43.2 b	13 bcd	1999 abc
12 Apron XL 3LS + Maxim 4FS + Systhane 40 WP + A15436A + Cruiser 5 FS	7.5 + 2.5 + 21 + 26 + 0.34	g/100 kg seed mg/seed	61.0 abc	44.6 b	11.2 cd	1899 abc
LSD P=0.05			**21.0**	**16.2**	**5.6**	**408**

[1] Plant stand was based on the number of seedlings per 25 feet of row. [2] DAP = days after planting. [3] Skip index rating is equal to the footage of row greater than 1 foot not occupied by seedling. Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

EFFECT OF SELECTED SEED TREATMENTS ON COTTON SEEDLINGS IN CENTRAL ALABAMA, 2006

T. B. Hatchett, K. S. Lawrence, and B. Durbin

Selected seed treatment fungicides were evaluated for the management of cotton seedling disease. The field had a history of seedling disease and the soil type was a Marvyn sandy loam. Soil was 67 degrees F at a 4-inch depth at 10 a.m. with adequate moisture at planting. All seed treatments were applied by the manufacturer. Temik 15G at 5 pounds per acre was applied at planting on April 17 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrip control. Plots consisted of four rows 25 feet long with a 40-inch row spacing and were arranged in a randomized complete block design with four replications. Blocks were separated by a 10-foot alley. Standard herbicides, insecticides, and fertility production practices as recommended by the Alabama Cooperative Extension System were used throughout the season. Stand counts and skip index ratings were recorded at 2 and 4 weeks after planting to determine the percent seedling loss and stand density due to cotton seedling disease. Plots were harvested on September 8. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Seedling disease pressure was moderate in 2006 when cotton was planted early. Cotton seedling stand was increased by the RTU Baytan Thiram/Allegiance alone (1) or combined with Trilex/Allegiance/Baytan (3) or TSX (6) at 14 days after planting (DAP) as compared to the black seed control (5). These same treatments continued to support the greatest plant stands at 28 DAP. All fungicide seed treatments also resulted in numerically lower skip indexes at 28 DAP compared to the control; however, differences were not significant at the 0.05 level. A significant increase in yield was observed with RTU Baytan Thiram/Allegiance plus TSX (6) compared to RTU Baytan Thiram/Allegiance plus Trilex/Vortex/Allegiance/Baytan (2) and the black seeded control (5).

EFFECT OF SELECTED SEED TREATMENTS ON STAND, SKIP INDEX, AND YIELD IN CENTRAL ALABAMA

Treatment	Rate/seed	——Stand/25 ft. row [1]——		Skip index [3]	Seed cotton
		14 DAP [2]	28 DAP	28 DAP	*lb/ac*
1 RTU Baytan Thiram/ Allegiance	3.0 + 0.75	77.0 a	60.0 ab	9.0	2040.0 ab
2 TRT 1 + Trilex/ Vortex/Allegiance/Baytan	0.64+0.08+0.75+0.25	65.5 ab	48.8 b	11.0	2017.5 b
3 TRT 1 + Trilex/Allegiance/Baytan	0.64+0.75+0.25	70.3 a	54.0 ab	7.8	2230.0 ab
4 TRT 1 + Dynasty CST	3.95	68.0 a	49.8 b	7.3	2197.5 ab
5 Untreated black seed		46.5 b	31.8 c	12.0	2010.0 b
6 TRT 1 + TSX 18.8G	5.5 lb/ac	82.5 a	67.3 a	7.8	2345.0 a
LSD (0.05)		**20.5**	**4.6**	**5.4**	**372.0**

[1] Plant stand was based on the number of seedlings per 25 feet of row.
[2] DAP = days after planting.
[3] Skip index rating is equal to the footage of row greater than 1 foot not occupied by seedling.
Means within columns followed by different letters are significantly different according to Fisher's LSD ($P < 0.05$).

COTTON BREEDING

Breeding Cotton for Yield and Quality in Alabama, 2006

D. B. Weaver

There are three major aspects to the 2006 project on cotton breeding reported in this study: development of cotton germplasm or cultivars with improved yield and fiber properties; evaluation of cotton germplasm for resistance to reniform nematode; and evaluation of cotton germplasm for resistance to abiotic stresses, particularly heat and drought.

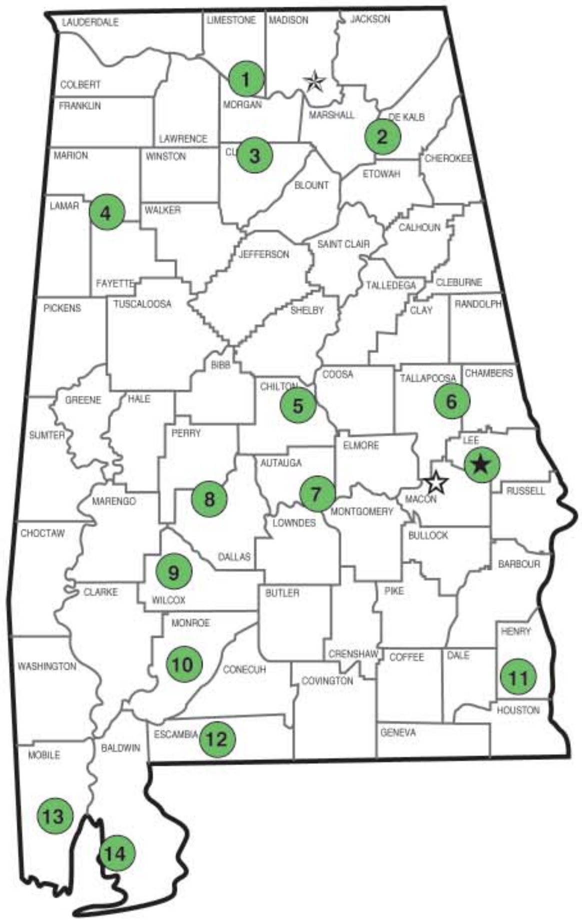
More than 200 experimental lines (developed by two methods of inbreeding: pedigree and single-seed descent) have been evaluated during 2005 and 2006 for yield and fiber properties. Preliminary analysis showed inbreeding method to have no effect on yield or fiber quality with few exceptions. Negative correlations among traits, particularly between lint yield and fiber strength, and lint yield and fiber length, continue to exist and be problematic in adapted germplasm, underlying the difficulty in selecting for improved yield and fiber properties simultaneously. Other negative correlations exist.

Several of these lines showed excellent yield potential, however, and will be advanced to regional cooperative tests (Regional Breeders Testing Network) for testing in 2007. We have cooperated in this test for the past four growing seasons. After extensive evaluation of 2000 cotton genotypes, we have identified seven that were considered moderately resistant to reniform nematode. These are considered only moderately resistant because they support roughly 30 percent of the nematode reproduction of a check cultivar. However, these genotypes are very poorly adapted (will not flower or produce yield in Alabama) and the incorporation of genes for resistance into adapted types will be a long-term process. Similarly, we have evaluated the same set of 2000 genotypes for reaction to heat during vegetative growth and have identified several that tolerate heat better than a check cultivar in the growth chamber. During the upcoming year, we will continue to work with these lines to determine the level of expression of this trait and hope to identify genes that are responsible.

CONTRIBUTORS INDEX

Alabama's Agricultural Experiment Station
AUBURN UNIVERSITY

With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, livestock, forestry, and horticultural producers in each region in Alabama. Every citizen of the state has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.



Research Unit Identification

★ Main Agricultural Experiment Station, Auburn.
✯ Alabama A&M University.
☆ E. V. Smith Research Center, Shorter.

1. Tennessee Valley Research and Extension Center, Belle Mina.
2. Sand Mountain Research and Extension Center, Crossville.
3. North Alabama Horticulture Research Center, Cullman.
4. Upper Coastal Plain Agricultural Research Center, Winfield.
5. Chilton Research and Extension Center, Clanton.
6. Piedmont Substation, Camp Hill.
7. Prattville Agricultural Research Unit, Prattville.
8. Black Belt Research and Extension Center, Marion Junction.
9. Lower Coastal Plain Substation, Camden.
10. Monroeville Agricultural Research Unit, Monroeville.
11. Wiregrass Research and Extension Center, Headland.
12. Brewton Agricultural Research Unit, Brewton.
13. Ornamental Horticulture Research Center, Spring Hill.
14. Gulf Coast Research and Extension Center, Fairhope.