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CONTENTS

Editors, Contributors . . . 3

VARIETY TRIALS

Response of Cotton Varieties to *Rotylenchulus reniformis* in a Greenhouse, 2004 . . . 5
Response of Selected Transgenic Cotton Varieties to *Rotylenchulus reniformis* in North Alabama, 2004 . . . 7
Cherokee County Cotton Variety Trial . . . 8
Screening Commercial Cotton Varieties Against Fusarium Wilt, 2004 . . . 8
Screening Cotton Germplasm for Heat and Osmotic Stress Tolerance . . . 9
Breeding Cotton for Yield and Quality in Alabama . . . 10
Evaluation of Cold Tolerant and Conventional Cotton Varieties and Planting Dates at the Tennessee Valley Research and Extension Center . . . 11
Evaluation of Cold-Tolerant and Conventional Cotton Varieties and Planting Dates at the Gulf Coast Research and Extension Center . . . 12
Evaluation of Cold Tolerant and Conventional Cotton Varieties and Planting Dates at the Prattville Agricultural Research Unit . . . 13
Evaluation of Cold Tolerant and Conventional Cotton Varieties and Planting Dates at the Wiregrass Research and Extension Center . . . 15
On-farm Cotton Variety Evaluations, 2004 . . . 17

CROP PRODUCTION

Rotating Cotton With Non-host Crops to Control Reniform Nematodes . . . 21
Subsurface Drip Irrigation (SDI) Tape Products and Fertigation, Tennessee Valley Research and Extension Center . . . 22
Surface Drip Irrigation (SDI) Placement and Irrigation Water Requirements, Tennessee Valley Research and Extension Center . . . 24
Evaluation of Pressure Compensating Subsurface Drip Irrigation (SDI) on Rolling Terrain for Cotton Production . . . 25
Sprinkler Irrigation Water Requirements and Irrigation Scheduling, Tennessee Valley Research and Extension Center . . . 25
Fifty Years of Soil Testing for Cotton in Alabama . . . 26
2004 Yields: The Old Rotation (circa 1896) and Cullars Rotations (circa 1911) . . . 29

INSECTICIDES

Evaluation of Granular Insecticides, Seed Treatments, and Foliar Over-sprays for Thrips Control on Cotton . . . 31
Thrips Control on Seedling Cotton . . . 33

HERBICIDES AND DEFOLIANTS

Comparison of Glyphosate-tolerant and Conventional Weed Management Systems in Full- and Reduced-Tilled Cotton . . . 34
Effect of Timing of Defoliation on Cotton Quality . . . 36

NEMATICIDES

Evaluation of Temik 15G and New Experimental Compounds for Root-knot Nematode Management in Cotton in Central Alabama, 2004 38
Evaluation of Recommended and Experimental Compounds for Reniform Nematode Management in Cotton in North Alabama, 2004 39
Evaluation of Telone II, Vapam HL, and Temik 15G for Reniform Nematode Management in Cotton in North Alabama, 2004 40
Evaluation of Seed Treatment Nematicides for Reniform Nematode Management in Cotton in North Alabama, 2004 41

FUNGICIDES

Evaluation of Selected Fungicide Seed Treatments for Management of Cotton Seedling Disease in Central Alabama, 2004. 43
Evaluation of Selected Fungicides for Management of Cotton Seedling Disease in the Tennessee Valley Region of Alabama, 2004. 45
Evaluation of Selected Fungicide Seed Treatments for Management of Cotton Seedling Disease in the Tennessee Valley Region of Alabama, 2004 46
Evaluation of Selected In-furrow Fungicides for Management of Cotton Seedling Disease in Central Alabama, 2004. 48

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VARIETY TRIALS

RESPONSE OF COTTON VARIETIES TO RENIFORM NEMATODE IN A GREENHOUSE, 2004

S.R. Usery, Jr., and K.S. Lawrence

Fifty-two cotton varieties were screened in a greenhouse for resistance to the reniform nematode (*Rotylenchulus reniformis*). Each variety was planted into a 150-cc container in sterile soil. Prior to emergence, each container was inoculated with 1,000 vermiform *R. reniformis*. Varieties were arranged in a randomized complete block design with five replications per test. Two separate tests at different planting dates were performed. Sixty days after planting, varieties were harvested. The roots were carefully removed from each pot and *R. reniformis* eggs were extracted from the roots with a 10-percent NaOCl solution. The soil was extracted using the Baermann funnel technique. *Rotylenchulus reniformis* were enumerated using a stereo microscope. Plant growth was also measured to determine early season vigor in a test planted as previously stated. Twenty days after emergence, plants were evaluated. Shoot length, root and shoot fresh weights, and root and shoot dry weights were recorded. Data were statistically analyzed using PROC GLM, and means compared with Fisher's protected least significant difference test ($P<0.05$).

All varieties tested supported reproduction of *R. reniformis*. Total vermiform *R. reniformis* plus egg populations varied from a high of 59,354 for Deltapine 488 BR to a low of 4,092 for Sure Grow 105. There was no significant correlation between *R. reniformis* or egg populations when compared to shoot length, shoot weight and root weight.

Response of Cotton Varieties to Reniform Nematode in a Greenhouse, 2004

VARIETY	RENIFORM 150 CM^3 SOIL	RENIFORM EGGS 150 CM^3 SOIL	SHOOT LENGTH (CM)	SHOOT DRY WEIGHT (G)	ROOT DRY WEIGHT (G)
Stoneville 4892 BR	10,066 b-e	19,856 e-n	12.80 d-o	0.222 f-r	0.078 i-n
FiberMax 958 LL	20,487 a	26,291 d-j	11.54 k-o	0.221 f-r	0.078 i-n
Deltapine 491	18834 a	28145 d-i	11.56 l-o	0.187 n-r	0.100 e-n
Deltapine 449 BR	15,280 ab	20,111 e-n	11.68 j-o	0.217 g-r	0.157 a-f
Deltapine 488 BR	19,699 a	39,655 a-d	11.50 k-o	0.161 r	0.060 l-n
Deltapine 434 RR	4,574 e-k	20,832 e-n	14.26 a-h	0.216 g-r	0.092 g-n
Stoneville 5303 RR	5,622 c-k	21,012 e-m	14.10 a-i	0.236 b-p	0.113 d-m
DeltaPearl	4929 d-k	18,849 f-o	11.52 k-o	.0229 e-q	0.064 l-n
Stoneville 4646 B2R	5,524 c-j	47,535 a-c	13.56 a-k	0,237 b-o	0.094 g-n
Stoneville 5242 BR	4,319 f-k	30,952 d-h	13.50 a-l	0.290 a-e	0.212 ab
FiberMax 991 BR	10,626 bc	27,066 d-i	15.56 a	0.286 a-f	0.150 b-h
FiberMax 991 B2R	6,798 c-i	29,123 d-i	15.44 ab	0.296 a-d	0.167 a-d
FiberMax 989 BR	4,604 e-k	30,720 d-h	13.90 a-j	0.281 a-g	0.184 a-c
FiberMax 966 LL	3,811 f-k	26,858 d-i	13.68 a-k	0.228 e-q	0.108 d-n
FiberMax 960 BR	3,438 f-k	27,424 d-i	12.87 d-o	0.219 g-r	0.089 h-n
FiberMax 991 RR	5,122 c-k	18,669 f-o	12.61 f-o	0.228 e-q	0.079 i-n
Deltapine 451 BR	3,925 f-k	28,093 d-i	13.45 a-l	0.246 b-n	0.114 d-l
Beltwide Cotton Genetics 28 R	4,738 e-k	20,291 e-n	12.00 i-o	0.199 k-r	0.048 n
Deltapine 493	4,612 e-k	27,115 d-i	10.90 n-o	0.172 o-r	0.088 h-n
Deltapine 494 RR	5,817 c-k	22,017 e-m	12.77 d-o	0.227 e-r	0.219 a
Deltapine 458 BR	6,034 c-k	28,712 d-i	12.50 g-o	0.250 b-n	0.072 j-n
Deltapine 5415 RR	7,409 c-h	30,214 d-h	13.18 c-m	0.190 m-r	0.051 mn

Response of Cotton Varieties to Reniform Nematode in a Greenhouse, 2004 (continued)

VARIETY	RENIFORM 150 CM3 SOIL	RENIFORM EGGS 150 CM3 SOIL	SHOOT LENGTH (CM)	SHOOT DRY WEIGHT (G)	ROOT DRY WEIGHT (G)
Deltapine 444 BG/RR	10,344 b-d	26,085 d-j	13.79 a-j	0.227 e-r	0.120 d-l
Deltapine 436 RR	6,273 c-j	32,316 c-g	11.07 m-o	0.191 m-r	0.137 c-i
Deltapine 424 B2R	8,490 c-f	28,300 d-i	13.21 b-m	0.231 c-p	0.092 g-n
Paymaster 1218 BG/RR	7,802 c-g	16,429 h-p	14.33 a-g	0.297 a-c	0.149 c-h
Fiber Max 960 B2R	2,457 g-k	46,543 a-c	12.06 h-o	0.194 l-r	0.134 c-j
Deltapine 555 BG/RR	2,001 h-k	23,828 e-l	11.82 j-o	0.231 c-p	0.090 h-n
Sure-Grow 747	2,441 g-k	10,480 k-p	13.50 a-l	0.239 b-n	0.129 c-k
Sure-Grow 215 BR	3,546 f-k	10,477 k-p	15.32 a-c	0.259 a-l	0.118 d-l
Stoneville 5599 BR	2,078 h-k	14,160 i-p	13.79 a-j	0.297 a-c	0.129 c-k
Sure-Grow 521 RR	1,840 i-k	17,974 g-p	13.08 c-n	0.198 k-r	0.101 e-n
Stoneville 4793 RR	3,361 f-k	8,285 l-p	15.32 a-c	0.302 ab	0.107 d-n
Phytogen 410 RR	5,670 c-k	34,631 b-e	12.83 d-o	0.230 d-p	0.127 c-k
DPLX 02X39BR	4,015 f-k	48,050 ab	14.82 a-f	0.319 a	0.138 c-i
DPLX 00W12	3,623 f-k	34,067 b-f	13.07 d-n	0.226 e-r	0.130 c-k
DPLX 02T57R	4,427 f-k	34,029 b-f	13.56 a-k	0.258 a-l	0.089 h-n
Beltwide Cotton Genetics 50 R	3,909 f-k	51,325 a	14.69 a-g	0.291 a-e	0.131 c-k
STX 6636 BR	4,581 e-k	25,161 d-k	13.60 a-k	0.292 a-e	0.120 d-l
Deltapine 432 RR	2,673 g-k	17,582 g-p	10.89 n-o	0.201 j-r	0.078 i-n
Sure-Grow 105	1,646 i-k	2,446 p	12.55 g-o	0.256 a-m	0.140 c-i
Deltapine 5690 RR	2,124 h-k	9,154 l-p	14.95 a-d	0.274 a-h	0.106 d-n
DPLX 03Q301DR	520 k	4,252 op	14.88 a-e	0.270 a-i	0.161 a-e
DPLX 01W93BR	595 k	5,264 n-p	13.81 a-j	0.206 i-r	0.079 i-n
Fiber Max 989 RR	833 jk	6,682 m-p	13.59 a-k	0.212 h-r	0.100 e-n
STX 6848 RR	1,151 jk	11,225 j-p	12.70 d-o	0.261 a-k	0.132 c-j
Fiber Max 960 RR	2,094 h-k	34,067 b-f	13.63 a-k	0.247 b-n	0.153 b-g
STX 3636 B2R	1,715 i-k	16,029 h-p	13.70 a-k	0.252 b-n	0.142 c-h
STX 4575 BR	2,472 g-k	17,266 g-p	14.19 a-i	0.267 a-j	0.098 f-n
Beltwide Cotton Genetics 24 R	1,978 h-k	25879 d-k	12.72 d-o	0.163 qr	0.051 mn
STX 5454 B2R	2,804 g-k	26,729 d-j	10.80 o	0.170 p-r	0.069 k-n
STX 4686 RR	2,943 g-k	26,072 d-j	13.81 a-j	0.298 ab	0.128 c-k
LSD (P<0.05)	5,528	15,582	2.240	0.0669	0.0628

RESPONSE OF SELECTED TRANSGENIC COTTON VARIETIES TO *ROTYLENCHULUS RENIFORMIS* IN NORTH ALABAMA, 2004

S.R. Usery Jr., K.S. Lawrence, C.H. Burmester, and G.W. Lawrence

Twelve transgenic cotton varieties were examined with and without Telone II for their response to the reniform nematode (*Rotylenchulus reniformis*) in north Alabama. The test was planted on April 29, 2004, in a producer's field naturally infested with the reniform nematode and monocultured in cotton. The soil was a Decatur silt loam. Telone II at three gallons per acre was applied one month before planting with a modified John Deere ripper/bedder injection device. A CO^2-charged system was used to propel the fumigants through flow regulators mounted on stainless steel delivery tubes attached to the trailing edge of forward-swept chisels. Telone II was injected 18 inches deep. Rows were immediately hipped with disk hillers to seal the fumigant. Plots consisted of two rows, 25 feet long with 40-inch row spacing. All plots were maintained with standard production practices recommended by the Alabama Cooperative Extension System and commonly used in the area. Population densities of reniform nematode were determined at planting, peak bloom, and at harvest. Soil cores, one inch in diameter and eight inches deep, were collected from the rows in each two-row plot in a systematic sampling pattern. Nematodes were extracted using gravity sieving and sucrose centrifugation technique. Plots were harvested October 27, 2004. Data were statistically analyzed using PROC GLM, and means were compared with Fisher's protected least significant difference test ($P<0.05$).

Reniform nematode disease pressure was moderate in 2004. The application of Telone II increased seed cotton yields and percent lint turnout, while reducing final reniform nematode populations ($P<0.05$). Seed cotton yields increased 7 percent and lint turnout increased 1 percent in plots treated with Telone II. The application of Telone II reduced final reniform nematode populations 29 percent. Cotton seed yields in plots treated with Telone varied 1,374 pounds per acre between Stoneville 5599 BR and Deltapine 5415 RR, respectively. Seed cotton yields in untreated plots varied 974 pounds per acre between Fiber Max 960 BR and Stoneville 4793 RR, respectively. Telone II had the least amount of impact on Fiber Max 989 RR and Fiber Max 960 BR with only a 2.1-percent yield decrease in nontreated plots. Application of Telone II had the greatest impact on Stoneville 4793 RR with a 16.3-percent yield decrease in the nontreated plots.

Response of Selected Transgenic Cotton Varieties to *Rotylenchulus reniformis* in North Alabama, 2004

VARIETY	% LINT TURNOUT TELONE II	% LINT TURNOUT CONTROL	SEED COTTON TELONE II	SEED COTTON CONTROL	RENIFORM PER 150 CC TELONE II	RENIFORM PER 150 CC CONTROL
Deltapine 444 BG/RR	0.4175 ab	0.4175 a	4,790.0 ab	4,218.5 a-c	1,410.0 ab	1,931.0 a
Deltapine 449 BG/RR	0.4050 bc	0.4025 bc	4,105.5 cd	3,789.0 cd	2,027.8 ab	1,776.0 a
Deltapine 451 BG/RR	0.3750 d	0.3800 d	4759.5 a-c	4,428.5 ab	1,777.0 ab	2,105.0 a
Deltapine 5415 RR	0.4200 a	0.4025 bc	3,847.0 d	3,714.3 cd	1,448.0 ab	2,143.0 a
FiberMax 960 BR	0.4200 a	0.4050 a-c	4,756.8 a-c	4,542.8 a	1,506.0 ab	2,414.0 a
FiberMax 989 RR	0.4150 a-c	0.4100 a-c	4,460.5 b-d	4,368.5 ab	579.0 ab	1,911.0 a
FiberMax 991 BR	0.4025 c	0.4000 c	4,244.5 b-d	4,153.8 a-c	811.0 ab	1,429.0 a
Paymaster 1218 BG/RR	0.4175 ab	0.4075 a-c	4,350.8 b-d	3,978.5 b-d	1,236.0 ab	1,217.0 a
Stoneville 4793 RR	0.4175 ab	0.4075 a-c	4,261.5 b-d	3,568.5 d	1,081.0 ab	2,259.0 a
Stoneville 4892 BR	0.4175 ab	0.4150 ab	4,397.8 b-d	4,035.0 a-d	2,395.0 ab	2,395.0 a
Stoneville 5599 BR	0.4125 a-c	0.4100 a-c	5,221.8 a	4,436.3 ab	444.0 a	1,699.0 a
Stoneville X 4686 RR	0.4175 ab	0.4175 a	4,610.8 a-c	4,411.0 ab	1,255.0 b	1,467.0 a
LSD (P<0.05)	0.0131	0.0131	667.19	512.63	1,854.7	1,534

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 2004, 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 wheat cover crop on April 23 and consisted of eight rows of each variety planted the length of the field. The variety DP 444 BG/RR was used as a check variety across the field.

A total of nine cotton varieties were planted in 2004. All varieties were genetically modified and contained the Roundup Ready gene that allows weed control applications with Roundup Ultra until the fourth-leaf stage. All varieties were spindle picked, and seed cotton was weighed in a boll buggy. A seed cotton sample from each variety was ginned on a tabletop gin for lint percentage.

Insect pressure was low much of the season, with plant bugs being the dominant pest problem. Yields were very high in this test location. However, hurricane Ivan's wind and rain damaged the area in mid-September. The varieties DP 444 BG/RR and ST 5242 BR sustained the most damage since these early-maturing varieties had the most open cotton. Phytogen 410R yield was not reported due to flooded spots in the field.

Cotton Variety Test Results in Cherokee County

Variety	Seed cotton lb/A	Lint* %	Lint lb/A
DP 555 BG/RR	3,406	44.0	1,499
FM 960 BR	3,423	42.5	1,455
ST 5599 BR	3,502	40.4	1,415
DP 432R	3,284	41.8	1,373
DP 434R	3,075	43.1	1,325
BCG 28R	3,297	40.1	1,322
DP 444 BG/RR	3,142	41.6	1,307
ST 5242 BR	3,156	41.2	1,300
Phytogen 410 R	**	39.8	**

*Lint percentage determined on a small gin without cleaners. This percentage is usually higher than normal turnout. **A low spot in the field reduced yields of this variety and, thus, it was not included in the report.

SCREENING COMMERCIAL COTTON VARIETIES AGAINST FUSARIUM WILT, 2004

W.S. Gazaway and K. Glass

Fusarium wilt has been successfully controlled through the use of resistant varieties during the past 50 years. Some 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 have been grown. In 2003, several of these susceptible varieties were severely damaged as a result of Fusarium wilt. To avoid this problem in the future, we established a Fusarium wilt nursery to identify susceptible commercial varieties. The commercial varieties and their susceptibility to Fusarium wilt is published annually in the Alabama Cotton IPM recommendations and in the Cotton Variety Report.

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 exhibited symptoms of Fusarium wilt. At the end of the season, four plants from each plot were dug carefully and their roots were evaluated for root-knot galls using a galling index of 1 to 5.[1]

The relative susceptibility of commercial cotton varieties in the test is shown in the following table. Cotton varieties were rated using the root-knot gall index (1-5). Root-knot incidence of all cotton varieties including Rowden averaged between 2 and 3. In previous years (2002 and 2003), distinct differences in the incidence of root-knot galling could be discerned among the more susceptible Fusarium wilt cotton varieties and those varieties that were more resistant.

Commercial Varieties Response to Fusarium Wilt and to Root-knot Nematodes, 2004

VARIETY	PERCENT FUSARIUM WILT		
	2002	2003	2004
Rowden		76	61
FiberMax 98LL	**	**	59
Stoneville 4646BR	**	**	17
Stoneville 4892 BR	**	18	10
FiberMax 958	32	11	**
Stoneville 4793 RR	20	**	**
Stoneville 580	18	**	**
Fiber Max 989BR	10	3	15
Paymaster 1218BG/RR	17	3	**
SureGrow 215BG/RR	12	3	**
FiberMax 960BR	**	3	10
Phytogen 410RR	**	3	8
Fiber Max 991BR	10	1	**
Deltapine 555BG/RR	**	0	7
Stoneville 5303RR	**	**	5
Deltapine 449BG/RR	**	**	5
Deltapine 444BG/RR	**	3	3
Deltapine 491	**	2	3
Deltapine 488BG/RR	**	**	3
Deltapine 5690RR	7	2	**
Stoneville 5599BR	**	1	2
Deltapine 451BG/RR	**	0	1
Deltapine 458BG/RR	**	3	**

**Cotton variety not in test that year.

All Deltapine varieties in this test showed good to excellent resistance to Fusarium wilt in 2004. Stoneville 5599BR and Stoneville 5303RR also showed excellent to good resistance to the wilt fungus, whereas, Stoneville 4646BR and Stoneville 4892 BR appeared to be more susceptible (see table). Most FiberMax varieties appeared to be extremely susceptible to wilt.

[1]Root-knot nematode root indices are reported as an average root gall rating from roots of four plants per variety, where 1= few or no galls visible on roots; 2 = galls visible on 1 to 20 percent of the roots; 3 = galls visible on 20 to 40 percent of the roots; 4 = galls visible on 41 to 80 percent of the roots; and 5 = galls visible on over 80 percent of the roots.

SCREENING COTTON GERMPLASM FOR HEAT AND OSMOTIC STRESS TOLERANCE

D.B. Weaver and R.D. Locy

Developing adapted cotton germplasm with tolerance to heat and drought is an important objective of many cotton breeding programs. To be successful, there must exist a genetic source of heat and drought tolerance, and there must be a way of evaluating cotton lines for heat and drought tolerance that is relatively rapid and accurate. Our objectives were to develop a rapid method of heat tolerance evaluation and to apply this method in evaluating the entire *G. hirsutum* USDA germplasm collection for heat tolerance.

We developed a procedure based on chlorophyll fluorescence, on the assumption that fluorescence (light emission) is a function of chlorophyll activity. We subjected seedlings of 1,380 different cotton types collected from various countries around the world to increasingly higher temperatures (up to 55°C, or 130°F) for up to one hour. Chlorophyll fluorescence was measured after exposure to each temperature. This value was compared to a base value of chlorophyll fluorescence under normal (30° C, or 86° F) conditions. The higher the ratio of heat-stressed chlorophyll fluorescence to normal fluorescence, the more activity the chlorophyll retains following heat treatment.

Theoretically, lines with a high ratio would have more heat tolerance. In our initial round of screening, we identified 53 cotton lines (referred to as the elite set) that had fluorescence ratios that were at least two standard deviations higher than the average for the entire group. We also identified 73 additional accessions with fluorescence ratios that were very close to the elite set. We intend to continue to evaluate these lines under more precise conditions and begin crossing them with adapted cotton germplasm to study inheritance of heat tolerance and begin the process of transferring heat tolerance into adapted lines.

BREEDING COTTON FOR YIELD AND QUALITY IN ALABAMA

D.B. Weaver

For U.S. cotton producers to remain competitive and profitable, it is necessary to continue to search for and develop superior varieties for production. Superior lint yield and lint quality are among the traits a new variety must possess. In order to continue to make progress in these areas, three conditions must be met: (1) There must be sufficient genetic variation for traits of interest; (2) There must be an efficient method of selecting for those traits in the generations immediately following the cross; and (3) the traits should be heritable. Recent years have seen little improvement in cotton yields and fiber quality. Several reasons have been suggested for this, among them the possibility that genetic variation may be declining due to a narrow genetic base for upland cotton, and the possibility that too much effort has been directed recently toward the commercialization of technology-added cotton.

A cotton breeding project was initiated at Auburn University in 2001 by making initial crosses among several well-adapted cultivars and germplasms. Our overall objectives were twofold: (1) to develop cotton germplasm and cultivars with improved lint yield and fiber quality traits adapted to Alabama and (2) to study the genetic variability and heritability of various quantitative traits in cotton, including the effects of various inbreeding methods on the variance and heritability of those same traits. Traits of particular interest are lint yield, lint percentage, fiber weight per seed, earliness, and fiber quality traits, particularly those related to length, length uniformity, short fiber content, and fiber maturity.

During 2002, six F2 populations, along with their parents and F1 progeny, were grown in the field and more than 1,500 individual plants were sampled and fiber analyzed by AFIS (Advance Fiber Information Systems). During 2003, we grew approximately 1,300 progeny rows from these individual F2 plants (F2:3 lines) (pedigree method) and also grew single plant progenies from each F2 plant (single-seed descent method). Three plants were sampled from each of the F2:3 lines (pedigree) lines for determination of fiber traits by AFIS.

Based on analysis of traits on a single-plant basis in the F2 and F3 generations, it appears that adequate genetic variation exists for many traits, but often they are population- and/or generation-specific. Fiber length, for example, was heritable in some populations, but not others. Short fiber content was not heritable among F2 plants but was a heritable trait among F3 plants. Lint weight/seed was highly heritable among F2 plants but was not a heritable trait among F3 plants.

Based on fiber quality traits, we have selected the best 300 lines and will begin yield-testing of these lines at Tallassee and Prattville during 2005. This will be our first chance to measure the yield potential of these lines and estimate statistical parameters related to yield. We will continue to study these populations, and determine heritability and genetic variation among these lines as they are moved from testing on a single-plant basis to being observed on a replicated plot basis. Only by growing replicated plots can we make determination of the degree of genetic variation on the most important trait of all-lint yield.

EVALUATION OF COLD-TOLERANT AND CONVENTIONAL COTTON VARIETIES AND PLANTING DATES AT THE TENNESSEE VALLEY RESEARCH AND EXTENSION CENTER

D.P. Delaney, C.D. Monks, C.H. Burmester, B.E. Norris, and K. Glass

Seed for cotton cultivars currently grown in Alabama require warm soils in order to germinate and develop properly. Soil temperatures must remain above 60° F for several days, which normally occurs after early April in much of the state. Cold fronts, rain, and heavy mulches used with conservation tillage can delay this even further. Producers who plant early in the season run the risk of poor stands, delayed germination, and seedling disease, as well as stunting from chilling injury.

If producers were able to plant earlier, soil moisture may be more favorable and cotton would potentially have a longer growing season, peak flowering would more likely occur during the longest summer days, and cotton may set bolls before soil moisture supplies are depleted by hot weather. For northern areas, this may enable harvest before cold, wet fall weather. Recently released "cold-tolerant" cotton varieties are claimed to germinate and grow well at temperatures well below the optimum for currently grown commercial varieties.

Two varieties each of "cold-tolerant" and "conventional" cotton cultivars were planted at each of three planting dates at the Tennessee Valley Research and Extension Center (TVREC) in Belle Mina. One variety of each type was an early maturity and the other full season. Four replications of four 40-inch rows by 25-foot long plots of each variety were planted on April 6, 16, and 28, 2004, using conventional tillage.

Fertility and pesticide applications were made according to Alabama Cooperative Extension System recommendations. Rainfall was plentiful through most of the season, and harvest conditions were generally good.

Cotton was defoliated, 100 boll samples were hand-picked, and plots harvested with a spindle picker when each treatment was mature. Seed cotton samples were ginned on a mini-gin for lint quality and turnout, and lint was analyzed for quality by HVI at the USDA-AMS lab at Pelham, Alabama.

Yield and turnout results are presented in the table. Lint yields ranged from 1,409 to 1,770 pounds per acre. Lint turnout ranged from 40 to 44 percent.

Stands were lower for the first planting date. The only significant difference in varieties was between CT 212 HQ, a claimed "cold-tolerant" cultivar, and FM 958. Although initial stands from the first planting were less, good growing conditions allowed poor stands to compensate and yield well. Factorial analysis indicated that there was no significant effect of planting date on yield, lint turnout, or quality measurements. Cultivars, however, did yield significantly differently across planting dates, and were different for most lint quality aspects (data not shown). Further testing will be needed to determine if these varieties have the potential to allow earlier planting for producers.

Lint Yields from Cold-Tolerant Varieties by Planting Dates, TVREC, 2004

PLANTING Date	CULTIVAR	STAND *plants/50 ft*	LINT YIELD *b/A*	TURNOUT *%*
Planting Date 1	CT 110 HQ	126	1,448	40
Planting Date 1	CT 212 HQ	134	1,739	42
Planting Date 1	FM 958	104	1,614	43
Planting Date 1	DP 491	117	1,656	44
Planting Date 2	CT 110 HQ	156	1,409	40
Planting Date 2	CT 212 HQ	165	1,751	42
Planting Date 2	FM 958	153	1,653	44
Planting Date 2	DP 491	155	1,770	44
Planting Date 3	CT 110 HQ	157	1,532	41
Planting Date 3	CT 212 HQ	159	1,744	43
Planting Date 3	FM 958	145	1,557	43
Planting Date 3	DP 491	172	1,762	44
LSD (P=.10)	20	134	1	

EVALUATION OF COLD-TOLERANT AND CONVENTIONAL COTTON VARIETIES AND PLANTING DATES AT THE GULF COAST RESEARCH AND EXTENSION CENTER

D.P Delaney, C.D. Monks, M.D. Pegues, R. McDaniel, and K. Glass

Seed for cotton cultivars currently grown in Alabama requires warm soils in order to germinate and develop properly. Soil temperatures must remain above 60° F for several days, which normally occurs after early April in much of the state. Producers who plant early in the season run the risk of poor stands and seedling disease, as well as stunting from chilling injury.

If producers were able to plant earlier, soil moisture may be more favorable and cotton would potentially have a longer growing season. Peak flowering would more likely occur during the longest summer days, and cotton may set bolls before soil moisture is depleted by hot weather. In south Alabama, this may allow harvest before the peak of the hurricane season. Recently released "cold-tolerant" cotton varieties are claimed to germinate and grow well at temperatures well below the optimum for currently grown varieties.

Two varieties each of "cold-tolerant" and "conventional" cotton cultivars were planted at each of three planting dates at the Gulf Coast Research and Extension Center (GCREC) in Fairhope, Alabama. One variety of each type was an early maturity and the other full season. Four replications of four 40-inch rows by 25-foot long plots of each variety were planted on April 2, 16, and 29, 2004, using conventional tillage. Initial land preparation and planting were delayed by persistent heavy rainfall.

Fertility and pesticide applications were made according to Alabama Cooperative Extension System recommendations. Rainfall was plentiful to excessive through most of the season.

Boll rot ranged from 7 to 14 percent in mid-September (Table 1) due to persistent rainfall during boll maturity. Due to the approach of Hurricane Ivan, a one-meter (about 3.3 feet) row section of each plot in the first replication was handpicked and weighed. These samples were ginned on a mini-gin for lint quality and turnout, and lint was analyzed for quality by HVI at the USDA-AMS lab at Pelham, Alabama (Table 2). Ivan destroyed the test, and no further data were available.

Plant stands improved for all varieties from the first to the third planting date. Stands also improved from the tenth day after planting (10 DAP) to 21 DAP for the first two planting dates, but not for the third, when conditions were warmer. CT 110HQ, a "cold-tolerant" cultivar, had a higher stand count at 10 DAP than DP 491 for the first two planting dates, but not for the third date.

Table 1. Stand and Boll Data, Cold Tolerant Varieties by Planting Dates, GCREC, 2004

Planting Date	Variety	Plants 10 DAP* plants/60 ft	Plants 21 DAP plants/60 ft	Bolls % open 9/14/2004	Bolls % diseased 9/14/2004
Planting Date 1	CT 110 HQ	65	72	87	8
Planting Date 1	CT 212 HQ	52	51	75	9
Planting Date 1	FM 958	44	64	68	7
Planting Date 1	DP 491	43	55	72	14
Planting Date 2	CT 110 HQ	61	72	77	9
Planting Date 2	CT 212 HQ	46	50	65	13
Planting Date 2	FM 958	22	56	65	7
Planting Date 2	DP 491	30	53	69	11
Planting Date 3	CT 110 HQ	136	136	77	8
Planting Date 3	CT 212 HQ	107	104	79	8
Planting Date 3	FM 958	114	119	71	8
Planting Date 3	DP 491	140	138	66	7
LSD (P=.10)		20	20	15	7

*DAP=Days after planting

Table 2. Lint Yield and Quality, Cold-Tolerant Varieties by Planting Dates, GCREC, 2004

PLANTING DATE	VARIETY	LINT *lb/a*	TURNOUT *%*	MIC* *units*	LENGTH *inches*	STRENGTH *g/tex**	UNIF.* %
Planting Date 1	CT 212 HQ	989	39	3.9	1.08	29.0	82
Planting Date 1	FM 958	1,114	40	5.1	1.14	33.6	81
Planting Date 1	DP 491	706	40	4.8	1.17	29.6	82
Planting Date 2	CT 110 HQ	690	38	3.4	1.06	26.1	79
Planting Date 2	CT 212 HQ	1,089	40	4.1	1.11	30.6	83
Planting Date 2	FM 958	1004	40	4.6	1.17	31.6	82
Planting Date 2	DP 491	1221	39	4.7	1.21	31.8	84
Planting Date 3	CT 110 HQ	858	40	4.0	1.14	31.4	84
Planting Date 3	CT 212 HQ	1,030	39	3.8	1.14	29.9	84
Planting Date 3	FM 958	830	39	4.5	1.20	32.1	84
Planting Date 3	DP 491	573	38	4.1	1.23	31.0	83

*G/tex=Grams per tex; Mic=micronaire; Unif. =uniformity.

Yield and turnout results from the first replication are presented in Table 2. Lint yields are subject to some uncertainty, due to a variable stand and only one-meter row of harvest, but ranged from 573 to 1,l04 pounds per acre of open cotton before the hurricane. Lint turnout ranged from 38 to 40 percent. Plentiful mid-season rainfall allowed cotton in plots with poor stands to compensate.

Further testing will be needed with machine harvesting to determine if these varieties have the potential to allow earlier planting and economical yields for producers.

EVALUATION OF COLD-TOLERANT AND CONVENTIONAL COTTON VARIETIES AND PLANTING DATES AT THE PRATTVILLE AGRICULTURAL RESEARCH UNIT

D. P. Delaney, C.D. Monks, C.H. Burmester, D.P. Moore, and K. Glass

Seed for cotton cultivars currently grown in Alabama require warm soils in order to germinate and develop properly. Soil temperatures must remain above 60° F for several days, which normally occurs after early April in much of the state. Cold fronts, rain, and heavy mulches used with conservation tillage can delay this even further. Producers who plant early in the season run the risk of poor stands, delayed germination, and seedling disease, as well as stunting from chilling injury.

If producers were able to plant earlier, soil moisture may be more favorable and cotton would potentially have a longer growing season. Peak flowering would more likely occur during the longest summer days, and cotton may set bolls before soil moisture supplies are depleted by hot weather. For northern areas, this may enable harvest before cold, wet fall weather. Recently released "cold-tolerant" cotton varieties are claimed to germinate and grow well at temperatures well below the optimum for currently grown varieties.

Two varieties each of "cold-tolerant" and "conventional" cotton cultivars were planted on each of three planting dates at the Prattville Agricultural Research Unit (PARU) in Prattville, Alabama. One of the varieties was an early maturity and the other full season. Four replications of four 36-inch rows by 28-foot long plots of each variety were planted on April 2 and 19 and May 5, 2004, using conventional tillage.

Fertility and pesticide applications were made according to Alabama Cooperative Extension System recommendations. Rainfall was plentiful through most of the season. Hurricane Ivan caused significant damage to early maturing varieties in mid-September, and harvest was further delayed by wet weather.

Plots were defoliated and then harvested with a spindle picker on October 18. One-pound grab samples were ginned on a mini-gin for lint quality and turnout, and lint was analyzed for quality by HVI at the USDA-AMS lab at Pelham, Alabama.

Yield and turnout results are presented in the table below. Harvested lint yields ranged from 385 to 590 pounds per acre. Lint turnout ranged from 39 to 43 percent.

Stands were lower at the first planting date with little difference between varieties at 10 days after planting (10 DAP), but differences were apparent for the 21 DAP count, particularly for the second and third planting dates. Both planting date and cultivar had significant effects on yield, with no interactions between them. Most lint quality measurements were significantly different for varieties, or for an interaction of variety and planting date. Further testing will be needed to determine if these varieties have the potential to allow earlier planting for producers.

Cold-Tolerant Varieties by Planting Dates, Prattville Agricultural Research Unit, 2004

Planting Date	Variety	10DAP *Plants/56'*	21DAP *Plants/56'*	Lint Yield *lb/a*	Turnout *%*	Mic* *units*	Length *inches*	Strength *g/tex**	Unif* *%*
Planting Date 1	CT 110 HQ	44	61	442	41	4.1	1.15	30.4	83
Planting Date 1	CT 212 HQ	44	75	566	40	4.1	1.09	28.5	82
Planting Date 1	FM 958	40	56	427	42	4.5	1.12	31.1	83
Planting Date 1	DP 491	29	52	590	43	4.6	1.14	29.9	83
Planting Date 2	CT 110 HQ	55	143	442	39	4.2	1.13	28.4	82
Planting Date 2	CT 212 HQ	57	152	526	40	4.6	1.07	27.3	81
Planting Date 2	FM 958	58	139	530	42	4.6	1.10	29.9	82
Planting Date 2	DP 491	55	146	655	43	4.6	1.13	29.4	82
Planting Date 3	CT 110 HQ	56	150	415	40	4.2	1.13	29.2	82
Planting Date 3	CT 212 HQ	55	156	492	41	4.9	1.08	29.2	81
Planting Date 3	FM 958	52	118	385	42	4.7	1.12	29.7	82
Planting Date 3	DP 491	53	132	466	43	4.7	1.16	30.1	82
LSD (P=.10)		11	16	97	0.7	0.3	0.04	1.1	1

*G/tex=Grams per tex; Mic=micronaire; Unif. =uniformity.

EVALUATION OF COLD-TOLERANT AND CONVENTIONAL COTTON VARIETIES AND PLANTING DATES AT THE WIREGRASS RESEARCH AND EXTENSION CENTER

D.P. Delaney, C.D. Monks, Brian Gamble, Larry Wells, and K. Glass

Seed for cotton cultivars currently grown in Alabama require warm soils in order to germinate and develop properly. Soil temperatures must remain above 60° F for several days, which normally occurs after early April in much of the state. Producers who plant early in the season run the risk of poor stands and seedling disease, as well as stunting from chilling injury.

If producers were able to plant earlier, soil moisture may be more favorable and cotton would potentially have a longer growing season, would have peak flowering during the longest summer days, and may set bolls before soil moisture is depleted by hot weather. In southeast Alabama, this may allow some cotton harvest before peanut harvest begins. Recently released "cold-tolerant" cotton varieties are claimed to germinate and grow well at temperatures well below the optimum for currently grown varieties and may allow earlier planting and harvest.

Two varieties each of "cold-tolerant" and "conventional" cotton cultivars, as well as two "stacked gene" varieties were planted on each of three planting dates at the Wiregrass Research and Extension Center (WREC) in Headland, Alabama. One variety of each type was designated by the respective seed company as early maturity and the other mid- to full season. Four replications of four 36-inch rows by 20-foot long plots of each variety were planted on April 1 and 16 and May 5, 2004, using a conventional-till production system.

Fertility and pesticide applications were made according to Alabama Cooperative Extension System recommendations. Rainfall was plentiful through most of the season. Due to the approach of Hurricane Ivan, the all treatments at maturity were defoliated and machine-harvested four days later. Those plots were picked a second time 16 days later, along with the remaining varieties had after defoliation. A one-pound

Table 1. Lint Quality, Cold-Tolerant Varieties by Planting Dates, WREC, 2004

TREATMENT	CULTIVAR	MIC* *units*	LENGTH *inches*	STRENGTH *g/tex**	UNIF.* *%*
Planting Date 1	CT 110 HQ	4.6	1.14	28.3	82.5
Planting Date 1	CT 212 HQ	4.5	1.14	29.3	82.8
Planting Date 1	FM 958	4.5	1.16	29.9	82.8
Planting Date 1	DP 449 BG/RR	4.6	1.14	30.8	82.5
Planting Date 1	DP 444 BG/RR	4.1	1.13	28.8	83.3
Planting Date 1	DP 491	4.4	1.16	30.4	83.0
Planting Date 2	CT 110 HQ	4.3	1.17	29.8	83.5
Planting Date 2	CT 212 HQ	4.3	1.11	29.1	82.3
Planting Date 2	FM 958	4.5	1.15	31.2	83.0
Planting Date 2	DP 449 BG/RR	4.4	1.11	29.8	82.8
Planting Date 2	DP 444 BG/RR	4.1	1.15	29.4	83.8
Planting Date 2	DP 491	4.1	1.17	31.4	83.5
Planting Date 3	CT 110 HQ	4.1	1.15	30.2	82.5
Planting Date 3	CT 212 HQ	4.2	1.14	31.0	82.8
Planting Date 3	FM 958	4.4	1.16	30.8	83.0
Planting Date 3	DP 449 BG/RR	4.0	1.13	30.9	82.5
Planting Date 3	DP 444 BG/RR	3.9	1.16	29.7	83.8
Planting Date 3	DP 491	4.2	1.17	30.7	83.5
LSD (*P=.10*)		0.3	0.03	1.1	1.0

*g/tex=grams per tex; Mic=micronaire; Unif. =uniformity.

Table 2. Stands and Yield, Cold-Tolerant Varieties by Planting Dates, WREC, 2004

TREATMENT	VARIETY	7 DAP* *plants/40´*	21 DAP *plants/40´*	LINT YIELD *lb/A*	FIRST PICK YIELD *%*	TURNOUT *%*
Planting Date 1	CT 110 HQ	62	121	1,269	76	42
Planting Date 1	CT 212 HQ	63	122	2,006	78	41
Planting Date 1	FM 958	23	72	1,484	82	41
Planting Date 1	DP 449 BG/RR	28	125	1,796	86	41
Planting Date 1	DP 444 BG/RR	59	127	1,859	88	42
Planting Date 1	DP 491	26	105	1,295	70	42
Planting Date 2	CT 110 HQ	92	146	1,389	80	41
Planting Date 2	CT 212 HQ	101	128	1,246	100	41
Planting Date 2	FM 958	64	135	1,501	70	41
Planting Date 2	DP 449 BG/RR	77	142	1,251	100	41
Planting Date 2	DP 444 BG/RR	102	120	1,989	92	42
Planting Date 2	DP 491	74	135	1,457	100	42
Planting Date 3	CT 110 HQ	78	122	1,256	100	40
Planting Date 3	CT 212 HQ	87	126	1,212	100	40
Planting Date 3	FM 958	63	125	1,325	100	41
Planting Date 3	DP 449 BG/RR	74	117	1,328	100	41
Planting Date 3	DP 444 BG/RR	81	130	1,258	100	43
Planting Date 3	DP 491	73	120	1,267	100	43
LSD (P=.10)		26	27	283	8	1

*DAP = Days after planting

grab sample from each plot was ginned on a mini-gin for lint quality and turnout, and lint was analyzed for quality by HVI at the USDA-AMS lab at Pelham, Alabama (Table 1).

Plant stands improved from the first to the second planting dates on the seventh day after planting (7 DAP) count (Table 2), but decreased for the third date due to heavy rains after planting, with some variety differences. Yields tended to be higher for the first planting date, and the early varieties of second planting date which could be picked before the hurricane, although there were statistical interactions between varieties and planting dates for yield. Those varieties with a "first pick" percentage of less than 100 percent were harvested for the first time before the hurricane.

Micronaire was higher with early planting, while strength increased with later planting (Table 1). Varieties differed in all quality measurements, but there were no interactions between planting date and the variety for quality.

Further testing will be needed with machine harvesting to determine if these varieties have the potential to allow earlier planting and economical yields for producers.

ON-FARM COTTON VARIETY EVALUATIONS, 2004

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The primary objective of this study was to provide producers with unbiased (third-party) information on the performance of recently released cotton varieties. While seed company and university small plot trials are very useful, on-farm trials provide further information on how specific varieties will perform when evaluated under growers' production systems. These trials also provide an opportunity to broaden the scope of evaluations to different soil textures not found on university research sites.

Each year, the Alabama Experiment Station System conducts cotton variety trials at five locations (experiment stations) in the state. These trials are established using four replications in a randomized complete block design with two-row plots, 25 to 30 feet in length. The results of these trials allow producers to compare relative differences among a large number of varieties, enable researchers to build a long-term data base on specific varieties, and provide a consistent picture of performance because the tests are conducted using uniform techniques from location to location. Seed companies are also very active in establishing on-farm variety strip trials. However, producers continue to be adamant in their need for unbiased data from on-farm variety systems trials with which to compare industry data.

In 2004, eight on-farm variety trials were established in the following counties in Alabama: Barbour, Dale, Cherokee, Shelby, Elmore, Perry, Macon, and Coffee (Table 1). Each trial was planted, maintained, and harvested using producer equipment and methods. The Barbour and Macon trials were planted in irrigated fields while the others were planted under dryland production. The trials were machine-harvested and seed cotton weights were recorded. After harvest, seed cotton was ginned on a small 10-saw research gin (without lint or stick cleaners) and quality analysis conducted by the USDA Cotton Classing office in Birmingham, Alabama.

Environmental conditions for most of the growing season resulted in a very high state yield average of 729 pounds per acre that was of high quality. However, the following locations were not harvested or data not presented due to severe mid-September storm damage from Hurricane Ivan: Coffee, Dale, and Perry counties.

Lint yields and quality for each location are presented in tables 2-6. An overall summary of variety performance (yield rankings) for the north and central Alabama locations is presented in Table 7. Included in this table are comparisons with yield rankings from selected Alabama and Georgia state variety trials.

DP 555 BG/RR and FM 991 BR were among the highest performers in most of the trials. At several locations, the mid- to full-season varieties yielded higher when compared to early-season entries. This is likely a result of storm damage to early-maturing varieties that would have had more open bolls compared to the later-maturing entries.

This type of data is useful for Alabama cotton producers to compare varieties over a range of soil textures and environments. An interesting comparison of technology indicated that, in general, the BG/RR stacked gene combination performed better when compared to its BGII/RR counterpart. Additional data are required in

Table 1. On-farm Variety Evaluations in Alabama, 2004

LOCATION	REA/CEC*	DATA TABLE	PRODUCER	REPS.	CROP	HARVEST DATE
Cherokee Co.	Derrick	2	McMichen	4	Dryland	9/29
Elmore Co.	Kuykendall	3	Peoples	4**	Dryland	9/13
Shelby Co.	Colquitt, Griffith	5	Barber	2***	Dryland	10/2
Perry Co.	Yates	-	Kish	1	Dryland	NA
Macon Co.	Clary	4	Walters	1	Irrigated	10/13
Coffee Co.	Petcher		Hussey	1	Dryland	****
Dale Co.	Birdsong	-	Williams	2	Dryland	****
Barbour Co.	Birdsong	6	Corcoran	2	Irrigated	10/8

*Regional Extension Agent or County Ext. Coordinator, Alabama Cooperative Extension System. **Harvested as two bulked replications. ***Harvested as one bulked replication. ****Harvested but not reported due to storm damage.

order to further compare the performance of the BGII/RR technology (Table 7). Producers understand that varieties can perform differently under varying environmental conditions. The excellent growing conditions and low insect pressure present in 2004 resulted in excellent yields in most of the trials.

Table 2. Summary of Turnout, Yield, and Quality for Cherokee County, 2004*

Variety	Percent turnout	Lint yield *lb/a*	Yield rank
DP 555 BG/RR	44	1,499	1
FM 960 BG/RR	43	1,455	2
ST 5599 BR	40	1,415	3
DP 432R	42	1,373	4
DP 434R	43	1,325	5
BCG 28R	40	1,322	6
DP 444 BR	42	1,307	7
ST 5242 BR	41	1,300	8
PHY 410R	40	**	**

*Each individual plot was approximately 1400 feet long by four rows wide. Due to a low area in the field, this yield was not included in the report.

Table 3. Summary of Turnout, Yield, and Quality for Elmore County, 2004*

Variety	Percent turnout	Lint yield *lb/a*	Yield rank	Micronaire	Length	Strength	Uniformity
DP 555 BG/RR	42	1,074	1	5.0	35	28.6	81
FM 991 BR	38	1,010	2	4.6	34.5	32.9	83.5
FM 991 RR	39	1,000	3	4.6	34.5	31.1	82
DP 494 RR	41	985	4	4.6	36	31.9	83
ST 5599 BR	42	980	5	4.8	35.5	30.2	81.5
ST 5242 BR	43	937	6	4.7	33	28.8	83
DP 488 BG/RR	41	922	7	4.6	36.5	31.4	82.5
PHY 410R	41	916	8	5.0	34	30.5	83.5
FM 960 BR	41	903	9	4.9	33.5	30.9	82
FM 989 RR	40	902	10	4.4	34	32.0	82
FM 991 B2R	37	902	11	4.3	36	30.3	82.5
FM 960 RR	42	898	12	4.4	34.5	28.6	83
PHY 510R	38	892	13	4.8	35	30.4	82
DP 449 BG/RR	39	880	14	4.8	34.5	30.7	83
DP 434 RR	41	878	15	4.3	35.5	28.1	82.5
ST 5303 R	39	870	16	5.0	34	29.6	83
ST 4892 BR	43	846	17	4.6	34	31.0	83
DP 451 B/RR	37	805	18	4.8	34	27.6	81.5
DP 432 RR	40	797	19	4.6	34.5	31.0	82.5
ST 4793 RR	41	696	20	5.0	35	29.2	82.5

*Each individual plot was approximately 1,200 to 1,700 feet long by four rows wide. Four plots per variety were planted and yields were combined at harvest on Sept. 13.

Table 4. Summary of Turnout, Yield, and Quality for Macon County, 2004*

Variety	Percent turnout	Lint yield *lb/a*	Yield rank	Micronaire	Length	Strength	Uniformity
FM 991BR	41	1,406	1	4.4	35	32.7	83
DP 488 BG/RR	42	1,328	2	4.3	37	30.7	83
DP 494 RR	44	1,328	3	4.4	37	30.6	82
DP 434 RR	44	1,311	4	4.2	36	27.9	83
DP 555 BG/RR	45	1,300	5	4.2	35	28.7	82
FM 960B2R	43	1,253	6	4.7	36	28.9	83
PHY 510R	40	1,241	7	4	36	30.5	82
DP 432 RR	43	1,220	8	4.1	35	29.6	83
FM 960BR	40	1,219	9	4.4	35	32.1	82
ST 4892 BR	45	1,188	10	4.3	34	27.7	83
DP 449 BG/RR	42	1176	11	4.2	36	29.4	84
ST 5242 BR	43	1,163	12	4.3	35	27.8	83
ST 5599 BR	42	1,147	13	4.4	35	29.3	82
FM 991B2R	40	1,134	14	4	37	32.2	82
PHY 410R	41	1,076	15	4.6	35	28.9	84
ST 5303 R	42	1,066	16	4.7	34	31.6	83
DP 444 BG/RR	43	1010	17	3.7	36	30	83
ST 4646 B2R	42	875	18	4.2	35	28.6	82

*Each individual plot was approximately 800 to 900 feet long by four rows wide. One plot per variety was planted and harvested on October 13.

Table 5. Summary of Turnout, Yield, and Quality for Shelby County, 2004*

Variety	Percent turnout	Lint yield *lb/a*	Yield rank	Micronaire	Length	Strength	Uniformity
FM 991 BR	42	1,137	1	4.6	35	30.1	82
DP 449 BG/RR	43	1,135	2	4.7	34	30.5	83
DP 555 BG/RR	47	1,117	3	4.9	34	28.1	82
DP 432 RR	43	1,113	4	4.9	34	28.1	83
ST 5599 BR	43	1,106	5	4.9	35	28.7	83
DP 488 BG/RR	44	1,095	6	4.7	37	30.5	83
PHY 510R	42	1,084	7	4.5	35	30.2	81
DP 494 RR	44	1,064	8	4.9	36	30.6	83
FM 960 BR	43	1,063	9	4.8	33	32.1	82
FM 991 B2R	41	1,063	10	4.5	35	31.4	83
DP 434 RR	47	1,045	11	4.7	35	27.3	83
ST 4892 BR	44	1,041	12	5.3	33	26.7	83
DP 444 BG/RR	44	1039	13	3.9	34	28.2	83
FM 960 B2R	42	1,009	14	4.8	36	31.2	81
ST 5242 BR	42	988	15	4.2	34	27	83
ST 5303 R	41	975	16	4.5	36	31.7	84
ST 4646 B2R	40	947	17	4.6	34	28.8	81
PHY 410R	43	938	18	4.6	36	29.9	83

*Each individual plot was approximately 1,400 to 1,500 feet long by four rows wide. Two plots per variety were planted and yields were combined at harvest.

Table 6. Summary of Turnout, Yield, and Quality for Barbour County, 2004*

Variety	Lint yield/A	Yield rank	Return/acre	Micronaire	Length	Strength	Uniformity
SG 215 BRR	1,249	1	669.48	4.45	34.5	28.4	83.5
DP 451 BRR	1,213	2	662.91	3.8	36	29.8	82
DP 424 B2RR	1,190	3	654.86	4.1	36.5	30.95	83.5
DP 488 BRR	1,188	4	652.22	4.4	37	31.5	83
DP 444 BRR	1,167	5	643.89	3.75	36.5	31.5	83.5
FM 960 B2RR	1,141	6	627.28	4.3	37	34	82.5
DP 449 BRR	1,134	7	623.5	4.15	36.5	32.2	83
FM 991 B2RR	1,131	8	622.46	4.05	38	33.55	83
DP 432 RR	1,123	9	615.79	4.5	36	29.65	83.5
DP 494 RR	1,109	10	610.48	4.4	37.5	33.1	83.5
DP 458 BRR	1,097	11	600.37	4.2	36.5	31.2	81.5
FM 991 BRR	1,081	12	595.75	4.4	37	33.05	83.5
DP 434 RR	1,076	13	588.35	4.05	37	29.45	82.5
ST 4892 BRR	1,027	14	563.34	4.6	35.5	31.45	84.5
DP 555 BRR	1,027	15	562.69	4.35	36.5	30.55	82
PSC 410 RR	1,015	16	557.76	4.35	36.5	31.9	84.5
ST 5599 BRR	1,022	17	557.61	4.25	35.5	30.25	82.5
ST 4646 B2RR	1,003	18	552.32	3.95	36	30.25	82
FM 960 BRR	1,003	19	552.13	4.1	35.5	33.95	83.5
ST 4793 RR	992	20	539.61	4.45	36	29.8	83.5
PSC 510 RR	982	21	537.35	4.55	37	30.8	83
ST 5303 RR	975	22	535.60	4.1	35.5	33.5	83.5
DP 5690 RR	972	23	535.22	4.3	37	33.1	83
FM 991 RR	941	24	517.80	4.1	37.5	32.25	83
DP 5415 RR	936	25	513.12	4.5	36	31.05	83
DP 436 RR	907	26	494.36	4.1	37	28.4	83
FM 960 RR	893	27	492.74	3.85	37.5	32.4	83
ST 5242 BRR	898	28	486.63	4.2	35	28.9	83

*Each individual plot was approximately 1,000 feet long by four rows wide. Two plots per variety were planted and yields were combined at harvest.

Table 7. Relative Yield Rankings by Location, 2004*

	Alabama On-farm Trials				State Variety Trial Results			
Variety	Elmore	Macon	Shelby	Cherokee	TVS	EVS	WGS	Tifton
DP 432 RR	19	8	4	4	2	1	4	15
DP 434 RR	15	4	11	5	16	7	10	7
DP 444 BG/RR	NA	17	13	7	4	20	27	19
DP 449 BG/RR	14	2	2	NA	26	9	5	13
DP 488 BG/RR	7	2	6	NA	4	2	9	5
DP 494 RR	4	3	8	NA	5	9	4	9
DP 555 BG/RR	1	5	3	1	19	6	6	10
FM 960 BR	9	9	9	2	1	5	8	6
FM 960 B2R	NA	6	14	NA	20	4	20	32
FM 991 BR	2	1	1	NA	17	21	13	15
FM 991 B2R	11	14	10	NA	24	16	17	25
ST 4892 BR	17	10	12	NA	10	11	13	8
ST 5242 BR	6	12	15	8	21	13	20	18
ST 4646 B2R	NA	18	17	NA	27	14	25	24
ST 5599 BR	5	13	5	3	2	3	18	16
ST 5303 R	16	16	16	NA	8	18	23	2
PHY 410R	8	15	18	9	19	23	18	9

*Rankings as reported within their respective early or full-season trial location. The varieties listed first within each company were in the early season state variety trials (SVTs) and those listed below each company's line were in the full-season SVTs.

CROP PRODUCTION

ROTATING COTTON WITH NON-HOST CROPS TO CONTROL RENIFORM NEMATODES

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

Cotton farmers have routinely relied on nematicides to control reniform nematodes. Although effective in the short term, nematicides are expensive and do not always produce the desired economic returns. Since there are no commercial cotton varieties with resistance to reniform nematodes, rotation with non-host crops provides the only reliable alternative for their management. Two previous rotation studies indicated that one-year and/or two-year corn or peanut rotations can effectively reduce reniform nematodes to a manageable population. Moreover, rotating with non-host crops has also improved weed control, soil fertility, and soil texture. However, we need to determine if the use of nematicides in cotton following a one-year or two-year rotation with peanut or corn will improve cotton yields.

A multiyear project to make this evaluation began in 2004. The project was placed in a cotton field that was thought to be heavily infested with reniform nematodes. Rotation/nematicide treatments are summarized in the table.

The test is a factorial arrangement of a randomized complete block design, with summer rotation crops as the main factor (eight-row plots). Cotton following peanut or following corn are split into two four-row subplots. One of the two subplots was randomly selected and treated with a nematicide. The other subplot did not receive a nematicide. Continuous cotton receiving a nematicide and continuous cotton not receiving a nematicide were divided into four-row plots. The test is replicated five times. The entire field will be planted each fall with a rye winter cover crop that will be cut prior to planting the summer crops. Summer crops will be planted in a strip-till into the rye stubble. The nematicide/fumigant, Telone II, will be injected into the strip area using a Yetter applicator seven to 14 days prior to planting.

The 2004 rotation study was destroyed just prior to harvest by a hurricane. Winds of 115 miles per hour hit the test area, blowing cotton in open bolls to the ground and plants that had unopened bolls flat on the ground. Consequently, yield data could not be taken. Moreover, nematode populations in this new area were scattered more than our initial soil tests had indicated, making a comparison between rotation schemes impossible. An attempt to obtain uniform nematode distribution in the test area by artificially inoculating with reniform nematodes was unsuccessful. Consequently, the rotation study will be moved in 2005 to a new location that has a more uniform distribution of reniform nematodes.

Alternative Cropping/Nematicide Schemes to Control Reniform Nematodes in Cotton

NEMATICIDE/INSECTICIDE[1]	SUMMER CROPS					
	2004	2005	2006	2007	2008	2009
Cont.[2] cotton/ nematicide	cotton(N)	cotton(N)	cotton(N)	cotton(N)	cotton(N)	cotton(N)
Cont. cotton	cotton	cotton	cotton	cotton	cotton	cotton
Peanut-1 yr/nematicide	peanut(N)	cotton(N)	peanut	cotton(N)	peanut	cotton(N)
Peanut-1 yr	peanut	cotton	peanut	cotton	peanut	cotton
Peanut-2 yr/nematicide	peanut	peanut	cotton(N)	peanut	peanut	cotton(N)
Peanut-2 yr	peanut	peanut	cotton	peanut	peanut	cotton
Corn-1 yr/nematicide	corn	cotton (N)	corn	cotton(N)	corn	cotton(N)
Corn-1 yr	corn	cotton	corn	cotton	corn	cotton
Corn-2 yr/nematicide	corn	corn	cotton(N)	corn	corn	cotton(N)
Corn-2 yr	corn	corn	cotton	corn	corn	cotton

[1]Cotton treated with nematicide (N), Telone II, at three gallons per acre using a Yetter rig, for nematode control or with insecticide, Di-Syston 15, at seven pounds per acre in the furrow at planting for early season insect control. Note: No nematicides will be used in peanut or corn plots.
[2]Cont.=Continuous.

SUBSURFACE DRIP IRRIGATION (SDI) TAPE PRODUCTS AND FERTIGATION, TENNESSEE VALLEY RESEARCH AND EXTENSION CENTER

L.M. Curtis, C.H. Burmester, D.H. Harkins, and B.E. Norris

A subsurface drip irrigation (SDI) study initiated in 1998 at the Tennessee Valley Research and Extension Center in Belle Mina, Alabama, was designed to compare five different drip irrigation tape products with a fertigation component included. This study was installed in an area where continuous crops have been produced for many years. Emitters were located two feet along the tape, with tape buried 15 inches between every other row. Rows 340 feet in length were used to better simulate field conditions. Fertilizer management for each tape product was evaluated using a single (conventional) surface-applied sidedress versus multiple sidedress applications injected through the SDI system. A tape product was also used on the surface using a conventional fertilizer treatment. Fertility treatments in 2004 are indicated in Table 1.

The varieties selected each year were DPL 33B (1998 and 1999), DPL 428B (2000 and 2001), DPL 451BR (2002 and 2003), and DP 444BG/RR (2004).

Fertigated yields were less in 2004 compared to conventional fertilization. Wet conditions throughout the growing season made surface-applied fertilizer readily available. The dryland treatment yielded less than irrigated treatments, but this may be attributed to the lower quantity of fertilizer on dryland plots in a year with abundant rainfall.

In 1998, little difference between fertility treatments was observed. In 1998, sufficient rainfall occurred late in the growing season so that fertilizer in the upper layers of the soil was more readily available. In 1999, extremely dry conditions in the upper layers of the soil profile made conventionally applied fertilizer less available, resulting in yield reduction compared to fertilizer applied through the irrigation system. In 2001, initiation of fertigation through the tape was inadvertently delayed more than two weeks. Even though the fertigation schedule was modified to ensure that all scheduled fertilizer was applied, the delay reduced fertigated yields.

Yields in 2002 were similar to previous years, with little difference in fertilizer treatments but significant yield improvement over the nonirrigated treatment. In 2003, fertigated treatment yields were reduced for three of the tape products when compared to conventional fertility treatments. This difference may be related to very wet conditions through much of the growing season, resulting in shallow root development with less uptake of nutrients from the 15-inch depth where the drip tape was installed and where fertigation delivered nutrients. This possibility is speculative, however, and is not based on field measurements.

Significant yield differences were observed each year between nonirrigated plots and tape plots with fertility treatments. Figures 1 and 2 illustrate yield results for 1998 through 2004 for conventional and fertigated treatments. Average yields for the seven years are shown in Table 2.

Table 1. Fertility Treatments in 2004

	Irrigated			Non-irrigated
	Fertigated	Conventional	Drip tape on surface[1]	
Preplant	30# N on cover crop	30# N on cover crop	NA	30# N on cover crop
Sidedress[2]	120#N + 60#K	120#N + 60#K	NA	60# N

[1] The surface tape treatment was discontinued after 2000 because of damage and leaks caused by insects and animals. [2]All sidedress was applied at early to mid square for conventional and dry tape treatments; the sidedress treatment was divided into eight equal applications for the fertigated treatments beginning at early to mid-square.

Table 2. Seven-Year Average per Tape Treatment

	POUNDS SEED COTTON PER ACRE	
	CONVENTIONAL	FERTIGATED
Not irrigated	2,149	
Surface T-Tape[1]	3,545	
T-Tape	3,391	3,373
Raintape	3,499	3,467
Netafim	3,475	3,454
Eurotape	3,500	3,528

[1] The surface tape treatment was discontinued after 2000 because of damage and leaks caused by insects and animals.

Figure 1. Conventional Fertility Program and Drip Tape Comparison

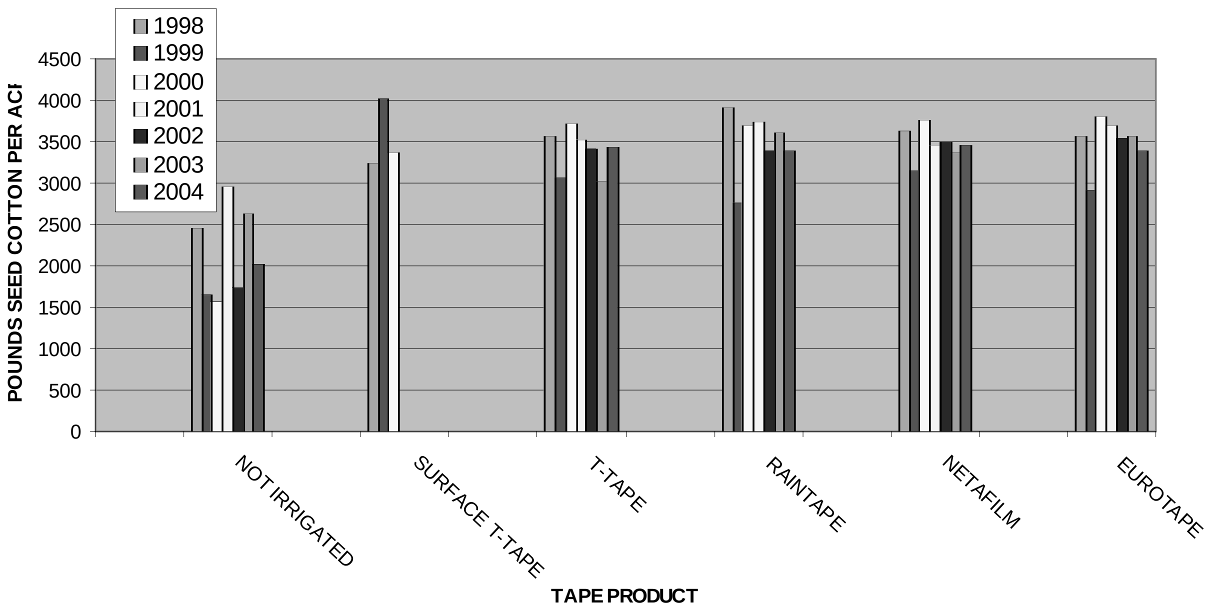
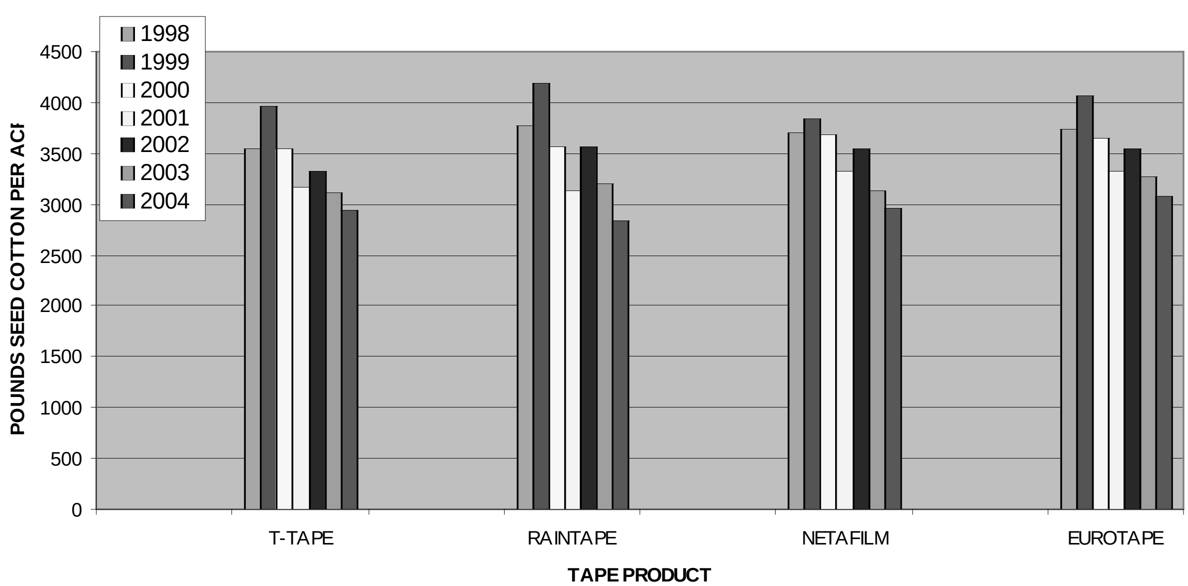


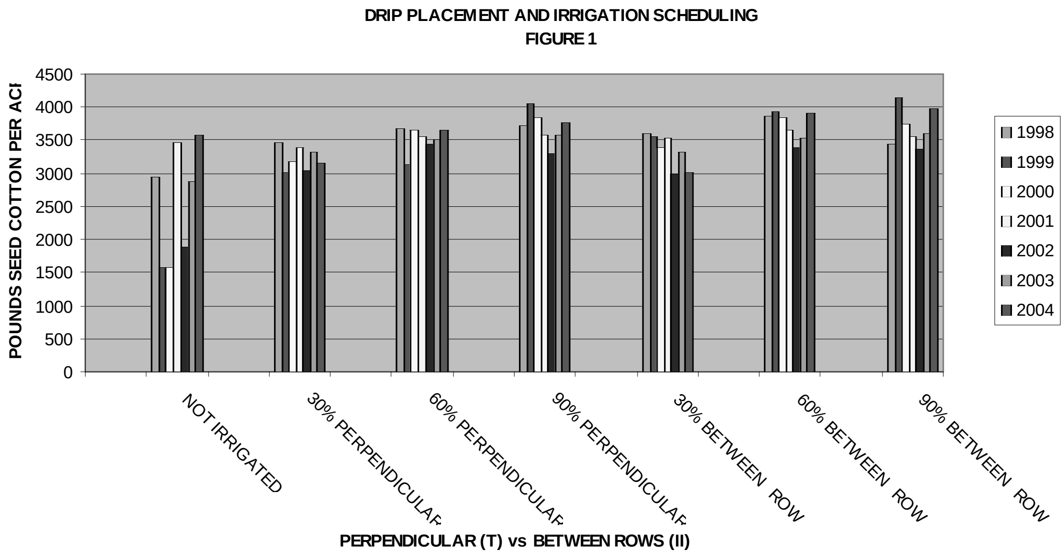
Figure 2. Fertigated Program and Tape Comparison



SUBSURFACE DRIP IRRIGATION (SDI) PLACEMENT AND IRRIGATION WATER REQUIREMENTS, TENNESSEE VALLEY RESEARCH AND EXTENSION CENTER

L.M. Curtis, C.H. Burmester, D.H. Harkins, and B.E. Norris

This experiment was initiated in 1998 to evaluate placement of subsurface drip irrigation (SDI) relative to crop row direction and to evaluate water requirements for cotton production using SDI. Drip tubing was buried 15 inches deep with emitters at two-foot intervals along the tubing. Tubing placement treatments were (1) between every other row-80-inch spacing between drip lines and (2) perpendicular to rows-80-inch spacing between drip lines. The varieties selected each year were DPL 33B (1998 through 2001) and DPL 451BR (2002 through 2004).



Irrigation treatments were based on daily applications equal to 30 percent, 60 percent, and 90 percent of pan evaporation after full crop canopy, with adjustments based on percent canopy prior to full canopy cover. Yield results for seven years (1998 through 2004) are presented in Figure 1. Yields in 2004 were little affected by irrigation, and dryland yields equaled or exceeded irrigated yields.

Significant yield increases were achieved with SDI for four out of the seven years of this study, with average yields over these seven years as shown in the table.

The average over all irrigation treatments for the seven years was 976 pounds of seed cotton per acre greater than the seven-year average for the non-irrigated treatment.

Average Yield over Seven Years

TREATMENT	POUNDS SEED COTTON PER ACRE
Non-irrigated	2,558
30% pan, perpendicular to rows	3,226
60% pan, perpendicular to rows	3,516
90% pan, perpendicular to rows	3,694
30% pan, between rows	3,343
60% pan, between rows	3,729
90% pan, between rows	3,697

EVALUATION OF PRESSURE-COMPENSATING SUBSURFACE DRIP IRRIGATION (SDI) ON ROLLING TERRAIN FOR COTTON PRODUCTION

L.M. Curtis, J.P Fulton, J.N. Shaw, R. Raper, C.H. Burmester, B.E Norris, and H.D. Harkins

A study was established at the Tennessee Valley Research and Extension Center (TVREC) in Belle Mina, Alabama, during 2003 to evaluate the use of subsurface drip irrigation (SDI) on rolling terrain. One objective of the study is to evaluate cotton production on rolling terrain at the TVREC with subsurface drip irrigation (SDI) in conjunction with two reduced-tillage practices. The other is to evaluate SDI installation and farming practices carried out using precision-guidance equipment and harvest correlated with terrain features using yield-monitoring equipment.

Installation of the SDI system was initiated in late fall and winter 2003 and was completed in late spring 2004. Because a component of this study was no tillage with a cover crop, the installation process disturbed the area, and wet weather delayed installation and planting the cover crop, we decided to treat the entire area uniformly in 2004. Stoneville 4892 BR was planted on the 14-acre area, with conventional fertility practices carried out.

Yield mapping at harvest indicated very uniform production throughout the field, with an overall yield of 3.2 bales (1,562 pounds of lint) per acre.

SPRINKLER IRRIGATION WATER REQUIREMENTS AND IRRIGATION SCHEDULING, TENNESSEE VALLEY RESEARCH AND EXTENSION CENTER

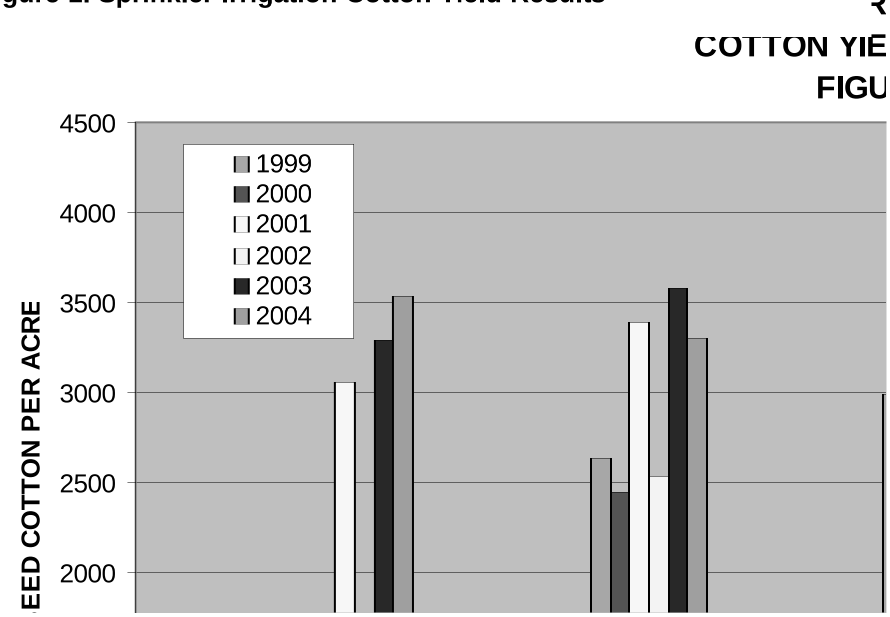
L.M. Curtis, C.H. Burmester, D.H. Harkins, and B.E. Norris

This experiment was established in 1999 to evaluate a range of irrigation application capabilities to identify the minimum design flow rate that will produce optimum yields.

Treatments included four sprinkler irrigation capabilities and a nonirrigated treatment. Irrigation was managed using soil moisture sensors and Moiscot, a spreadsheet-based scheduling method. The irrigation capabilities were (1) one inch every 12.5 days, (2) one inch every 6.3 days, (3) one inch every 4.2 days, and (4) one inch every 3.1 days. These irrigation capabilities are equivalent to 1.5, 3, 4.5, and 6 gallons per minute per acre. The one-inch amount represents the maximum amount of irrigation that could be applied in the time indicated.

The varieties selected each year were as follows: DPL 33B (1999), DPL428B (2000 and 2001), and DPL 451BR (2002 through 2004). The results for 1999 through 2004 are presented in the figure.

Figure 1. Sprinkler Irrigation Cotton Yield Results



In 2004, rainfall was plentiful throughout the growing season, and dryland and irrigated yields were not substantially different. The average yields for the six-year period in pounds of seed cotton per acre were:

Nonirrigated = 2,429 lb/a;

1 inch = 12.5 days, 2,980 lb/a;

1 inch = 6.3 days, 3,303 lb/a;

1 inch = 4.2 days, 3,505 lb/a;

1 inch = 3.1 days, 3,492 lb/a.

In 2003, rainfall was near optimum through much of the growing season, but a 26-day dry period occurred between August 7 and September 4. A total of only 0.61 inches of rain occurred during this period, and this rainfall was measured in seven minor rainfall events. Three timely one-inch irrigation applications during this period boosted irrigated yields, with 476 additional pounds of seed cotton per acre on the optimum irrigation treatment (one inch every 4.2 days).

In 2002, irrigated yields were significantly higher than nonirrigated yields, but the highest yields were less than in other years for most treatments. The reason for this is unclear but may be related to shutdown of irrigation prior to sufficient boll maturity. Only very small yield differences were noted in 2001, while significant differences were measured in 1999 and 2000. Rainfall variability and treatment effects accounted for the wide range of yield responses for each of these years.

FIFTY YEARS OF SOIL TESTING FOR COTTON IN ALABAMA

C.C. Mitchell and K.B. Holland

A summary of 50 years of public soil testing by Auburn University indicates that Alabama cotton producers are, in general, doing a very good job of maintaining a desirable soil pH and "high" soil test values for phosphorus (P), potassium (K), and magnesium (Mg) for optimum production.

The Auburn University Soil Testing Laboratory in 2004 celebrated 50 years of service to Alabama farmers by moving into a new facility. The new Alfa Agricultural Services Building on the Auburn University campus houses soil testing, plant analysis, feed and forage analysis, manure analysis, environmental testing, nematode assay, and plant diagnostic services. When soil testing began in 1953, it was mostly a service for cotton and corn producers. Soon afterward, other crop recommendations were added. In 2004, more than 50 crop recommendations were included, with cotton samples accounting for 13 percent of total recommendations.

Soil testing records or summaries of records have been kept since the laboratory began operation in 1954. Some of these records have been lost and some old computer records are difficult to recover. However, enough old summaries and data were recovered to make some general statements regarding the trends in soil fertility for cotton in Alabama. We estimate that about one-third to one-half of all commercial agricultural samples in Alabama are being tested by private laboratories.

Decreasing numbers of soil samples since the early 1980s reflect decreasing row-crop acreage in Alabama (Figures 1 and 2). However, acreages of cotton, peanuts, and hay have remained fairly constant during this time period (Figure 2).

Acid soil infertility has always been a concern of Alabama cotton producers, and regular ground limestone applications are part of their routine production inputs. Extremely acid soils (pH< 5.0) are generally less than 1 percent of total soils tested, but they do occur in problem situations (Figure 3). In the mid-1960s, almost 70 percent of samples needed lime (pH<6.0). Today, around 30 percent need lime each year. If we assume that a good cotton farmer may need to apply some limestone every three to five years in order to maintain a soil pH above 5.8, Alabama cotton producers are doing about as good a job of managing soil pH as could be expected. Soils with a pH above 7.0 are usually calcareous soils from the central Alabama Black Belt prairie region.

Cotton samples consistently test higher in Mg than other crops (Figure 4). This is probably because cotton farmers generally do a better job of liming their fields, and most use dolomitic limestone or calcitic limestone that is high in Mg. Fewer than 4 percent of all cotton samples need Mg, and these are usually the same samples with a low pH.

Farmers have become aware that putting out too much P is expensive and could degrade surface-water quality. Cotton soils testing very high (VH) and high (H) have been trending downward (Figure 5). At the same time, the number of samples testing medium (M) in P have been increasing. The low (L) and very low (VL) values have continued to stay approximately the same over the past 50 years. The slight increase in the number of "high" samples in 2004 may reflect a change in trends due to an increase in conservation tillage practices and P stratification in the soil surface.

Potassium nutrition of cotton has been a concern throughout the cotton belt for several years. Alabama has extensive research relating plow layer soil test K to cotton yields, and these trends indicate that soil test K levels have not changed very much since the 1980s (Figure 6). There is a slight trend toward fewer medium (M) and more high (H) testing soils.

Since the early 1960s, the AU Soil Testing Laboratory has categorized samples based on their soil texture and/or estimated cation exchange capacity

(CEC). Separate calibrations are used for each soil group. Samples from each soil group have remained fairly constant over the 50 years (Table 2).

Alabama cotton producers who have their soils tested by the Auburn University Soil Testing Laboratory are, in general, doing a very good job of maintaining a desirable soil pH and "high" soil test values for P, K, and Mg for optimum production. Long-term trends do not indicate any change in the fertility status of Alabama cotton soils. The AU laboratory tests about one sample each year for every 100 acres of cotton produced in the state.

The fact that some records have been kept over the years that allow at least a partial summary of soil test results is a credit to the past and present management of the AU Soil Testing Laboratory. Past directors of the laboratory are Clarence Wilson (1953-57), Dennis Rouse (1957-66), Tom Cope (1966-80), and Clyde Evans (1980-92). Current director is Hamilton Bryant (1993-present). We also wish to acknowledge Julia Zhu, who is making it possible to retrieve electronic soil test summaries for recent years.

Table 1. Leading Crops Recommendations in 2004

CROP	PERCENTAGE
All forage crops	38
Home gardens, lawns, shrubs	23
Cotton	13
Corn	7
Peanut	5
Soybean	3
Commercial vegetables and fruits	3
All other crops and non-crop areas	8

Table 2. Soil Groups Tested

SOIL GROUP	PERCENTAGE
Sandy soils with CEC< 4.6 cmol/kg	26
Loamy soils with CEC 4.7-9.0 cmol/kg	39
Silt loams and clay loams from the Limestone Valley region and soils high in organic matter (CEC 9.0+)	31
Clays from the Black Belt Prairie region (CEC 9.0+ cmol/kg)	4

Figure 1. Total Soil SamplesTested Since 1954 and Number of Cotton Recommendations Reported

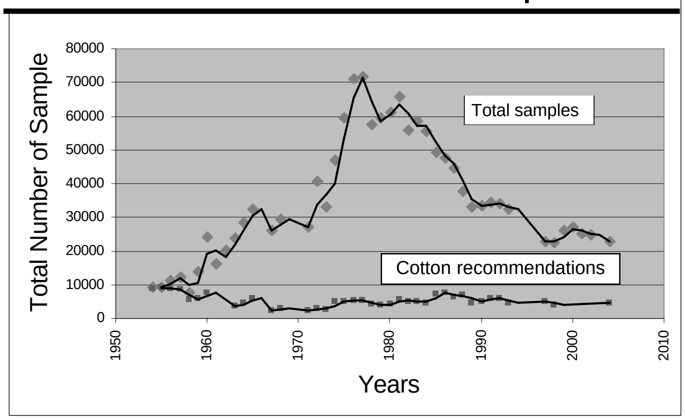
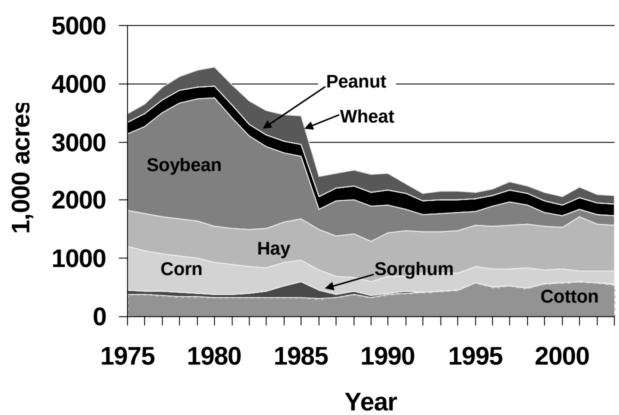


Figure 2. Alabama Row Crop Acreage 1975-2003



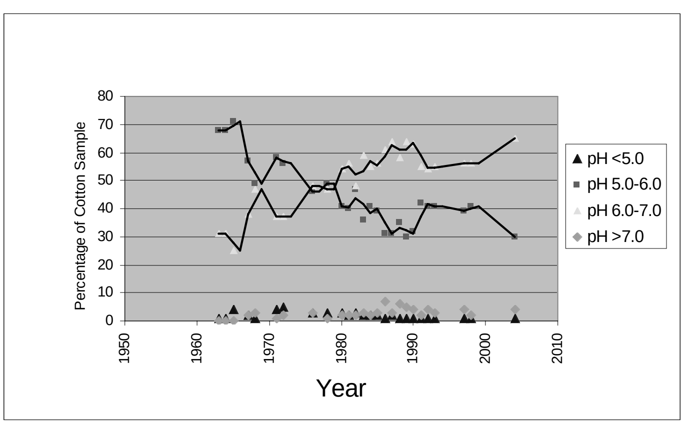
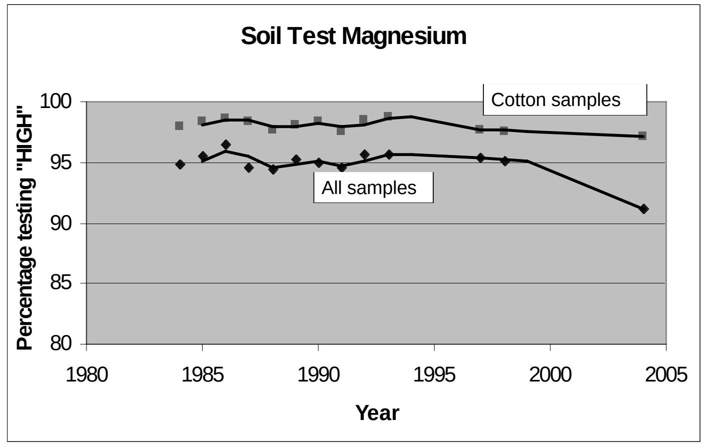


Figure 3. Trends in Soil pH for Alabama Cotton Samples Tested

Figure 4. Trends in Soil Samples Testing "HIGH" in Magnesium. High is defined as Mehlich-1 extractable Mg > 25 mg/kg for soils with a CEC > 4.6 cmol/kg or Mehlich-1 extractable Mg > 12.5 mg/kg for soils with a CEC< 4.6 cmol/kg.)



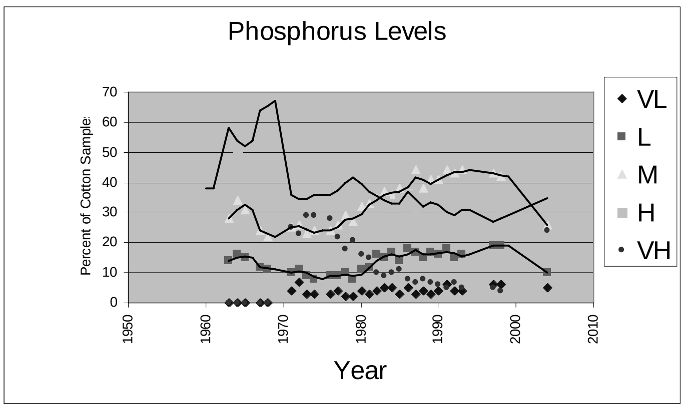
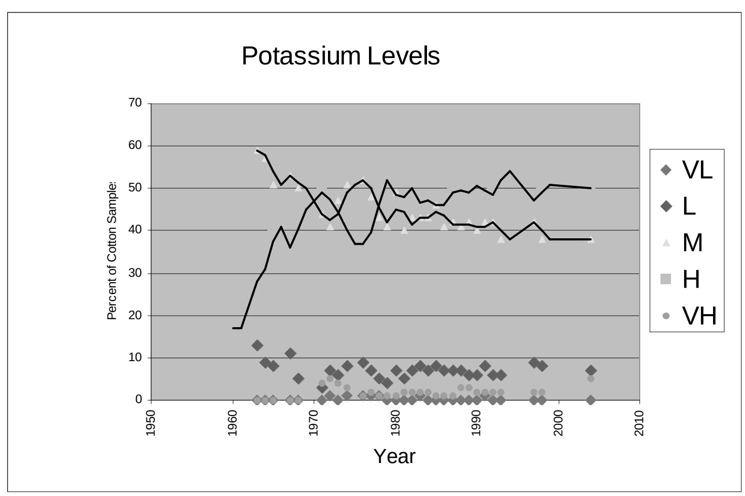


Figure 5. Trends in Soil Test P for Alabama Cotton Samples. VL= "very low" (Mehlich-1 extractable P< 6 mg/kg); L= "low" (M-1 extractable P = 6 to 12.5 mg/kg); M = "medium" (M-1 extractable P = 13-25 mg/kg); H = "high" (M-1 extractable P = 25 to 50 mg/kg); VH = "very high" (M-1 extractable P > 50 mg/kg).

Figure 6. Trends in soil test K for Alabama cotton samples. Extractable P values for very low (VL), low (L), medium (M), high (H), and very high (VH) depend upon the soil texture and cation exchange capacity (Adams, et al., 1994).



2004 YIELDS: THE OLD ROTATION (CIRCA 1896) AND CULLARS ROTATION (CIRCA 1911)

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

The two oldest, continuous field crop experiments in the South continue a trend toward higher yields. Of course, a very favorable 2004 growing season helped. Hurricane Ivan in September 2004 threatened to wipe out what appeared to be a near-record cotton yield, but most plots came through with little damage. An all-time-record cotton lint yield was harvested in early October: 1,650 pounds lint per acre on plot 5 (cotton-corn rotation plus N) on the Old Rotation and 1,950 pounds lint per acre on plot 1 (complete fertilizer/no legume) on the Cullars Rotation. Since 1997, when both of these experiments were converted to high-residue conservation tillage with annual subsoiling coupled with new technology, GMO cultivars, record and near-record yields of every crop have been produced on these two, long-term experiments.

The fact that new technology appears to have pushed yield potentials to new plateaus reinforces a conclusion reached in a 1996 paper which looked at 100 years of the Old Rotation. That paper looked at total-factor productivity and its influence on sustainable cotton production. The authors concluded that ". . . the

Table 1. Top Three Record Yields

CROP	OLD ROTATION (YEAR)	CULLARS ROTATION (YEAR)
Cotton (lb. lint/acre)	1,650 (2004)	1,930 (2004)
	1,600 (2001)	1,570 (1992)
	1,490 (1994)	1,550 (2001)
Corn (bu/A)	236 (1999)	168 (2001)
	193 (2001)	161 (1999)
	186 (2004)	155 (1996)
Wheat (bu/A)	94 (2001)	71 (2002)
	79 (1999)	70 (2001)
	73 (2004)	65 (2000)
Soybean (bu/A)	67 (1996)*	70 (1996)*
	61 (2004)	65 (2004)
	61 (1992)	60 (2003)

*In 1996, soybean was grown as a full-season crop; normally, soybean is planted double-cropped behind rye or wheat harvested for grain

Table 2. 2004 Old Rotation Yields

PLOT	DESCRIPTION	CLOVER DRY MATTER (*lb/acre*)	WHEAT (*bu/acre*)	CORN IRRIGATED (*bu/acre*)	CORN NON-IRRIGATED (*bu/acre*)	COTTON IRRIGATED (*lint/acre*)	COTTON NON-IRRIGATED (*lint/acre*)	SOYBEAN IRRIGATED (*bu/acre*)	SOYBEAN NON-IRRIGATED (*bu/acre*)
1	no N/no legume	(no data due to poor stand and growth)				620	470		
2	winter legume					1,080	840		
3	winter legume					1,310	980		
4	cotton-corn					1,330	1,120		
5	cotton-corn + N					1,650	1,150		
6	no N/no legume					390	340		
7	cotton-corn			62	52				
8	winter legume					1,200	1,150		
9	cotton-corn + N			186	113				
10	3-year rotation		72.5					60.6	59.8
11	3-year rotation					1,450	860		
12	3-year rotation			183	99				
13	cont. cotton/no legume +N					1,610	1,180		

Table 3. 2004 Cullars Rotation Yields

PLOT	DESCRIPTION	CLOVER DRY MATTER (*lb/acre*)	WHEAT (*bu/acre*)	CORN (*bu/acre*)	COTTON (*lint/acre*)	SOYBEAN (*bu/acre*)
A	no N/+legume	(no data collected due to poor stand)	58.1	64	1,360	63.8
B	no N/no legume		21.3	40	1,060	63.3
C	Nothing		0	0	0	0
1	no legume		46.2	106	1,930	61.8
2	no P		13.8	25	530	22
3	complete		48.1	64	1,830	64.2
4	4/3 K			41.1	102	1,160
5	rock P		43.6		104	
6	no K		44.9	33	0	46.1
7	2/3 K			53.2	108	1,270
8	no lime		4	63	0	0
9	no S		54.1	102	1,320	65.1
10	complete+ micros	50.6	116	1,410	62.6	
11	1/3 K		36.5	107	1,010	57.7

impact of (new) technology is powerful enough to offset the effect of many other changes in the (production) system" (Traxler et al., 1995).

Management is a factor that is difficult to document in long-term experiments but that certainly has an important role to play when documenting long-term yields. In 1997, the USDA-ARS Soil Dynamic Laboratory on the Auburn University campus provided the equipment and some of the labor necessary to maintain the high-residue conservation tillage on these experiments. Increased interest from other researchers and extension specialists and their expertise has contributed to better management of these plots.

Support from the Soil Dynamics Laboratory and Alabama commodity funds allowed half of the Old Rotation to be placed under irrigation in 2003; 2004 was the first full season that irrigation was evaluated. Irrigation was applied to cotton, corn, and soybean every other day based upon estimated evapotranspiration. An estimated 15 inches of water was applied during the growing season, beginning in late June. Irrigated cotton plots produced 132 percent of the nonirrigated plots. Irrigated corn produced 163 percent of the nonirrigated corn plots. Although only one treatment is planted to soybean, irrigation did not appear to have any effect on soybean yield.

In April 2003, the Cullars Rotation was officially listed on the National Register of Historical Places. (The Old Rotation was listed in 1988.) Posters highlighting this honor and presenting the history of the Cullars Rotation were presented at the 2004 Beltwide Cotton Conference in San Antonio, Texas, and at the 2004 American Society of Agronomy annual meetings in Seattle, Washington.

Both the Old Rotation and the Cullars Rotation are maintained through a joint effort of AU's Department of Agronomy and Soils, the Alabama Agricultural Experiment Station, and the USDA-ARS Soil Dynamics Laboratory. Over the years, additional support has come from checkoff funds from the Alabama Wheat and Feed Grains Committee, the Alabama Soybean Committee, and the Alabama Cotton Commission.

INSECTICIDES

EVALUATION OF GRANULAR INSECTICIDES, SEED TREATMENTS, AND FOLIAR OVERSPRAYS FOR THRIPS CONTROL ON COTTON

R.H. Smith

Trials were conducted in 2004 at the Prattville Agricultural Research Unit in Prattville, Alabama, to determine the efficacy of granular insecticides, seed treatments, and foliar oversprays in controlling thrips damage. The test was planted on April 15, 2004, using DP 451 BR. The test was set up as a randomized complete block design with four replications. Plots consisted of four rows and were 30 feet long. Materials evaluated as oversprays included Dimethoate, Nufos (Lorsban), and Orthene. Overspray materials were evaluated with and without at-planting treatments of Cruiser, Temik, and Gaucho Grande.

The first application of overspray materials was applied at the first true-leaf stage with a backpack sprayer at 10 gallons per acre (gpa) with hollow cone tips. The second overspray application was applied at the third true-leaf stage with a tractor-mounted boom sprayer at 10 gpa with hollow cone tips. Plots were evaluated for thrips populations, plant height, and damage on May 12, 17, 20, and 25, and June 4 and 22. Thrips population assessments were reported as thrips per row foot. Damage ratings were based on a one-to-five scale, with one showing no visible damage and five indicating that all plants have distorted leaves. Plots were evaluated for maturity by counting number of blooms per 30 feet of row on June 22, and counting open bolls on August 9. Due to hurricane damage, no yield results were recorded.

All at-planting treatments showed less thrips injury than the nontreated control on all observation dates. Gaucho Grande was slightly superior to Cruiser, and Cruiser was slightly superior to Temik in this trial. No foliar treatment improved thrips injury in the nontreated at-planting after the first application. Thereafter, all foliar sprays were superior to the nontreated. Of the foliar sprays, Orthene was superior to Dimethoate, which was distinctly better than Nufos. Nufos was the only foliar treatment that did not give acceptable visible results. Nufos looked better following Gaucho and Cruiser than Temik. Nufos over the nontreated at-planting was not very different than the nontreated alone.

All at-planting treatments had more blooms on June 22 than did the nontreated at-planting. Temik and Gaucho had slightly more blooms than did the Cruiser. Dimethoate oversprays resulted in more blooms in the Gaucho and nontreated, but not in the Cruiser and Temik treatments. Orthene improved earliness in the nontreated but not after Cruiser, Temik, or Gaucho. Nufos noticeably reduced the number of blooms in the nontreated and all at-planting treatments. Data from this test indicate that Nufos had a definite delaying effect when applied to cotton at the three and five true-leaf stage.

Since Nufos appeared to offer the least thrips control of the three overspray products in this test and later appeared to have a crop-maturity delaying effect, it is

Figure 1. Seasonal Average Thrips Populations

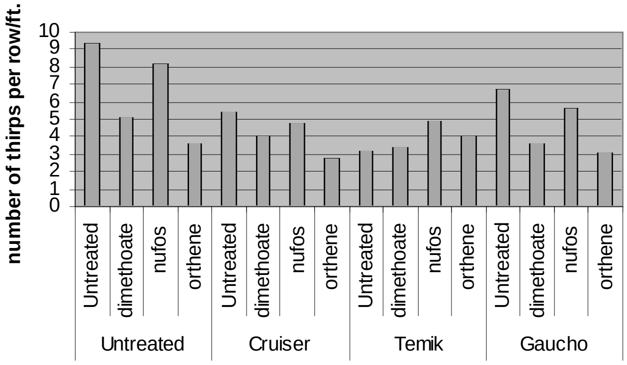


Figure 2. Seasonal Average Damage Rating

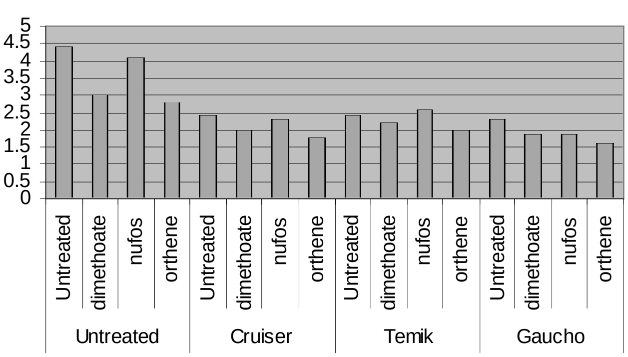


Figure 3. Seasonal Average Plant Height

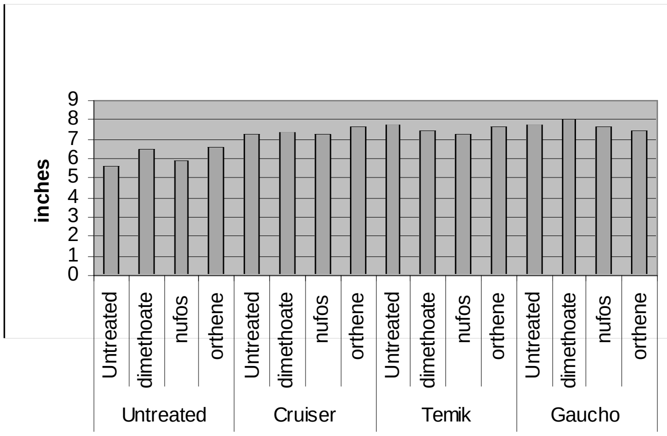
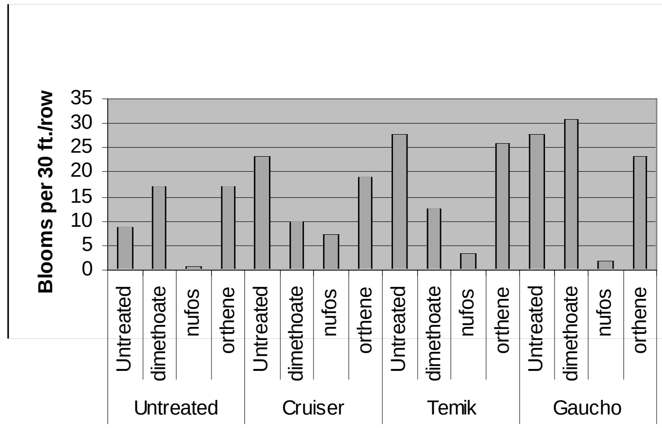
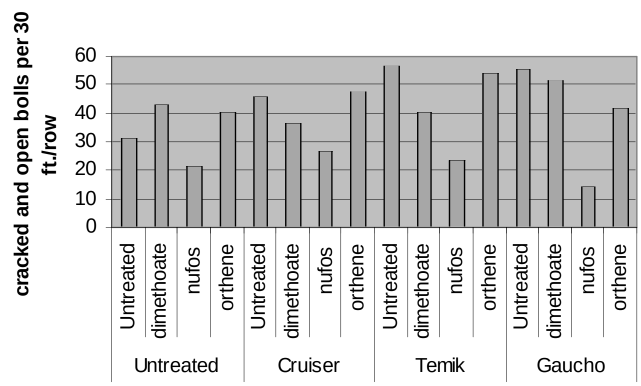


Figure 4. Bloom Count on June 22



likely not an acceptable chemical for early-season insect control. The results of the August 9 cracked boll count followed the white bloom count taken on June 22 very closely. At-planting treatments had more open bolls in general than did the nontreated controls at-planting. Gaucho and Temik had more open bolls than did Cruiser. Dimethoate did not improve the earliness of at-planting treatments but did show more open bolls than the nontreated at-planting. Orthene resulted in more open bolls in the nontreated at-planting and Cruiser treatments. However, Orthene did not improve the earliness of Temik or Gaucho. Nufos severely impacted the earliness, in a negative manner, of all three at-planting treatments and where no at-planting treatment was made. The delayed maturity from two oversprays of Nufos at the first and third true-leaf stages was noted throughout the remainder of the season.

Figure 5. Cracked and Open Bolls on August 9



THRIPS CONTROL ON SEEDLING COTTON

B.L. Freeman

This trial examined several rates and combinations of Cruiser, Temik, and a potential nematicide, Stan. Cotton, DP 451 BR, was planted on April 19, 2004, on the Tennessee Valley Research and Extension Center in Limestone County, Alabama. Plots were four rows by 25 feet each, and all treatments were replicated four times. Thrips populations were monitored on May 10, 17, and 25, 2004, by rinsing five plants from each plot in a 70-percent ethyl alcohol/water solution. Contents were filtered and examined under a stereoscope. Adult and larval thrips were tallied separately.

Thrips pressure during the trial was above average, and conditions for the development of cotton were optimal. The degree of thrips control is compared among treatments in Table 1. In general, Cruiser provided superior control to other treatments, and it was not until the fifth week after planting that the Cruiser-containing treatments averaged more than one thrips per plant. All Temik treatments averaged one or more thrips per plant at four weeks after planting, and the Temik 3.5 and 5.0 treatments exceeded one thrips per plant at only three weeks after planting. The Stan treatment provided an average of 46 percent thrips control but seemed to contribute little when added with Cruiser.

Cotton yields were excellent, and all insecticide/nematicide treatments outyielded the control treatment (Table 2). The five-and seven-pound rates of Temik and the two Cruiser-containing treatments improved yields by 16 to 20 percent (Table 2), while the lowest rate of Temik, and the Stan treatment raised yields by 14 percent and 8 percent, respectively (Table 2). Near-perfect growing conditions throughout the year allowed the cotton plant to compensate for various problems. Despite that, the insecticides in this trial boosted yields by roughly 15 to 20 percent, underscoring that thrips control on seedling cotton is critical.

Table 1. Number of Thrips per Five Plants

	MAY 10				MAY 17				MAY 25			
TREATMENT	A*	L*	T*	% Control	A	L	T	% Control	A	L	T	% Control
Cruiser + Stan	1.00	0.50	1.50	97	2.50	0.50	3.00	93	4.00	9.25	13.25	81
Cruiser	0.00	0.00	0.00	100	3.00	0.25	3.25	93	5.50	10.00	15.50	78
Temik 7.0 lbs.	0.25	2.25	2.50	95	3.00	2.00	5.00	89	3.00	15.75	18.75	73
Temik 5.0 lbs.	0.50	6.75	7.25	86	1.75	6.00	7.75	83	3.50	26.00	29.50	58
Temik 3.5 lbs.	1.25	4.00	5.25	90	2.75	8.25	11.00	76	5.75	23.75	29.50	58
Stan	4.25	22.50	26.75	47	2.75	15.25	18.00	61	6.50	39.25	45.75	35
Control	6.75	43.75	50.50	----	3.50	42.50	46.00	----	11.00	59.00	70.00	----

* A=Adult; L=larval; T=Total

Table 2. Seed Cotton Yields

TREATMENT	SEED COTTON *lb/A*	% INCREASE OVER CONTROL
Cruiser + Stan	3,983.78	19.88
Temik 5.0 lb	3,936.08	18.44
Temik 7.0 lb	3,911.25	17.70
Cruiser	3,862.25	16.22
Temik 3.5 lb	3,791.68	14.10
Stan	3,583.25	7.83
Control	3,323.19	----

HERBICIDES AND DEFOLIANTS

COMPARISON OF GLYPHOSATE-TOLERANT AND CONVENTIONAL WEED MANAGEMENT SYSTEMS IN FULL- AND REDUCED-TILLED COTTON

M.G. Patterson

Glyphosate-tolerant (GT) cotton varieties continue to comprise nearly 90 percent of the cotton acreage in Alabama. As a direct result, the use of reduced-tillage systems, including strip-till and no-till, has increased from 35 percent in 1997 to more than 65 percent. The compatibility of these two technologies has proved both economical and practical, especially as individual farm size has increased. GT varieties have many desirable agronomic traits and yield well. However, some producers have become increasingly concerned with the fiber quality of GT varieties-specifically, high micronaire (fineness) and low staple (length)-versus non-GT varieties. These fiber traits may impact the cash price paid for lint and thus farm profitability.

To quantify these concerns, a two-year field study was begun in 2003 to investigate the interaction of tillage system and variety on yield, fiber quality, and net returns. A factorial treatment arrangement of tillage (full vs. reduced) and variety (GT vs. non-GT) in a randomized complete block design with four replications was established at three locations in Alabama. Experimental units were eight rows by 50 feet long. Full-tillage plots were chiseled and disked (two times) prior to planting and included cultivation after crop emergence. Reduced-tillage plots were strip-tilled at the E.V. Smith (EVSRC) Research Center in Shorter and the Wiregrass Research and Extension Center (WREC) in Headland, while plots at the Tennessee Valley Research and Extension Center (TVREC) in Belle Mina were true no-till.

Varieties were selected based on location and growing season. SG 105 and SG 501RR varieties were used at TVREC. Deltapearl and DP 5415RR varieties were used at the EVSRC and WREC locations. Herbicide programs for each tillage system followed Alabama Cooperative Extension System recommendations and were supplemented on a case-by-case basis, if needed, to maintain good to excellent weed control. Visual estimations of weed control were recorded in late season. Seed cotton was machine harvested and weighed, and subsamples were ginned for fiber analysis (HVI). Gross returns were calculated based on total receipts, including discounts or premiums for fiber quality. A spot price of 60 cents per pound was selected, and herbicide prices were the average of three Alabama chemical retailers. Total weed management costs were estimated for each tillage/weed management system.

Lint yield and net returns are presented in Tables 1 and 2. Tillage and weed management system costs varied slightly for the four systems: full-tilled/GT costing \$58.65, full-tilled/non-GT costing \$58.03, reduced-till/GT costing \$47.65 (TVREC) and \$57.65 (EVSRC and WREC), and reduced-till/non-GT costing \$58.08

Table 1. Cotton Yield (*lb lint/a*) Response to Variety, Tillage, and Weed Management System in 2003 and 2004

	TVREC		EVSRC		WREC	
TREATMENT	2003	2004	2003	2004	2003	2004
Full till GT variety	1295	1086	1352	826	1498	1018
Full till Non-GT variety	1164	1026	1057	637	1701	1252
Reduced till GT Variety	1259	1147	1335	829	1427	972
Reduced till Non-GT variety	1240	1142	1413	685	1806	1094
LSD (.05)	101	-----	174	126	83	236

Table 2. Net Return Response (*dollars/a*) to Variety, Tillage, and Weed Management System in 2003 and 2004

	TVREC		EVSRC		WREC	
TREATMENT	2003	2004	2003	2004	2003	2004
Full till						
GT variety	510	357	536	125	645	321
Non-GT variety	437	344	355	56	789	483
Reduced till						
GT variety	497	425	530	130	599	294
Non-GT variety	491	417	585	50	851	367

(TVREC) and $68.08 (EVSRC and WREC). A general production cost of $300 per acre was used for all systems and locations, and individual costs for varieties and weed management costs specific to those varieties were added for calculation of net returns.

Late-season weed control was good to excellent for all cropping and weed management systems at all locations in both years. Lint quality was acceptable in all trials excepting the 2004 trial at EVSRC, where high micronaire caused deductions. Lint yields ranged from 637 to 1,806 pounds per acre during the course of the study, and net returns varied from $50 to $851 per acre. Hurricane Ivan caused significant yield loss at EVSRC in 2004, resulting in lower net returns. Average net returns for both full-till and reduced-till systems averaged over varieties, and locations were slightly better for reduced tillage ($436 vs. $414). Average net returns were similar for varieties within full-till systems ($416 for GT vs. $411 for non-GT). Average net returns favored non-GT varieties in reduced tillage ($460 vs. $412).

At the TVREC, both varieties provided similar yield and net returns under reduced tillage in 2003. The GT variety in full tillage produced yield and net return comparable to reduced tillage, with the non-GT variety in full tillage producing slightly lower yield and net returns. Reduced-tillage systems provided numerically higher yields and net returns in 2004. There was no difference between yield and net return for either variety within a tillage system. No deductions were observed for lint quality at Belle Mina for either variety or tillage system. The non-GT variety provided a slight premium for strength at Belle Mina.

Yield data at EVSRC showed a similar pattern as the data at Belle Mina for 2003. Yield and net returns were similar for both varieties in reduced tillage and the GT variety in full tillage. The non-GT variety in full tillage produced lower yield and net returns in 2003. Hurricane damage at Shorter in 2004 resulted in significantly lower yields and net returns for all systems and varieties. However, the GT variety in both tillage systems produced higher yields and net returns in 2004 than the non-GT variety. Significant deductions for high micronaire were seen for both varieties in 2004. This data is likely due to wind damage blowing the higher-quality lint from the non-GT variety.

The non-GT variety produced higher yield and net returns than the GT variety in both tillage systems at the WREC in 2003 and 2004. No deductions for lint quality were observed for either variety or tillage system either year.

EFFECT OF TIMING OF DEFOLIATION ON COTTON QUALITY

C.H. Burmester, C.D. Monks, and D.P. Delaney

Cotton micronaire (thickness of the cotton fiber) is one of the measurements used to gauge cotton quality. The standard for this measurement is a reading between 3.5 and 4.9. In recent years, 30 to 40 percent of Alabama's cotton crop had micronaire grades above 4.9, resulting in discounts to the farmers. The Hal-Lewis method of determining the micronaire of early-season bolls and adjusting defoliation timing is being used in some areas of the United States to reduce the amount of cotton bales with high micronaire values. Evaluation of the Hal-Lewis method was conducted under Alabama conditions in 2004.

Research on its effect on all cotton quality factors and total cotton yield is needed before being used in Alabama cotton fields.

In 2004, as cotton began opening, seed cotton samples were collected by hand from more than 90 grower fields in northern Alabama. These samples were ginned and, after micronaire was measured, the Hal-Lewis method was used to predict final cotton

Table 1. Projected Micronaire for Farmers' Cotton Fields Using the Hal-Lewis Method Compared to Final Classing Results in Alabama, 2004

VARIETY	MICRONAIRE	READINGS						AVERAGE MIC	DIFFERENCE
DP 444 BG/RR	Projected Mic.	3.40	3.40	3.60	3.70	3.60	3.70	3.56	-0.07
DP 444 BG/RR	Final Mic.	3.30	3.30	3.90	3.50	4.10	3.70	3.63	
DP 451 BG/RR	Projected Mic.	3.30	3.40	4.20	3.50	4.00		3.68	-0.28
DP 451 BG/RR	Final Mic.	3.80	3.90	4.00	4.00	4.10		3.96	
DP 555 BG/RR	Projected Mic.	4.10	3.90	4.30	4.00			4.08	-0.17
DP 555 BG/RR	Final Mic.	4.20	4.00	4.30	4.50			4.25	
ST 4892 BR	Projected Mic.	3.80	3.80	3.70	4.60	3.80		3.94	-0.28
ST 4892 BR	Final Mic.	3.60	4.10	4.40	4.30	4.70		4.22	
DPLX 01W93BR	Projected Mic.	3.40	4.10	3.60	4.10	3.70	3.90	3.80	-0.18
DPLX 01W93BR	Final Mic.	3.70	3.90	4.10	3.90	3.80	4.50	3.98	
FM 960 BR	Projected Mic.	4.10	3.70	3.70	4.10	3.90		3.90	-0.36
FM 960 BR	Final Mic.	4.00	4.30	4.00	4.40	4.60		4.26	
ST 5599 BR	Projected Mic.	3.70	4.00	3.70	4.40	4.10		3.98	-0.18
ST 5599 BR	Final Mic.	3.70	4.00	4.20	4.20	4.70		4.16	
DP 449 BG/RR	Projected Mic.	3.50	4.10	3.70	3.90	4.00		3.84	-0.22
DP 449 BG/RR	Final Mic.	3.70	3.90	4.10	4.20	4.40		4.06	
PM 1218 BG/RR	Projected Mic.	3.90	4.60	4.10	4.20			4.20	-0.20
PM 1218 BG/RR	Final Mic.	4.10	4.40	4.70	4.40			4.40	
ST 5242 BR	Projected Mic.	4.10	4.20	4.30				4.20	0.07
ST 5242 BR	Final Mic.	3.90	4.50	4.00				4.13	
DP 488 BG/RR	Projected Mic.	4.10	4.50	4.00	4.10			4.18	-0.02
DP 488 BG/RR	Final Mic.	3.90	4.30	3.90	4.70			4.20	
DP 432 R	Projected Mic.	3.40	3.90	3.40				3.57	-0.26
DP 432 R	Final Mic.	3.80	4.30	3.70				3.93	
DP 424 BG2/RR	Projected Mic.	3.70	4.20	4.00				3.97	-0.13
DP 424 BG2/RR	Final Mic.	3.90	4.30	4.10				4.10	
ST 4646 B2R	Projected Mic.	3.90	4.40	3.90				4.07	0.11
ST 4646 B2R	Final Mic.	3.90	4.10	3.90				3.96	

micronaire in each field. After harvest, the predicted values were compared to final classing office results. The effect of defoliation timing on micronaire, yield, and all other cotton quality factors was researched in two small-plot replicated trials. These trials were located at the Tennessee Valley Research and Extension Center (TVREC) and E.V. Smith Research Center (EVSRC) in north and central Alabama, respectively. These tests also evaluated the use of a boll opening product during each defoliation timing.

Evaluation of the Hal-Lewis method indicated that it did accurately predict that cotton micronaire values would be much lower in 2004 than previous years. It also accurately predicted that one cotton variety (DP 444BG/RR) would have much lower micronaire than the other varieties tested. Based on this data we advised farmers to delay defoliation as long as possible on DP 444 BG/RR to avoid a possible grade reduction for low micronaire. At harvest, farmer field micronaire grades were approximately 0.2 points higher than estimated by the Hal-Lewis method. This was probably due to the much warmer-than-normal September that allowed cotton to continue adding thickness to the upper bolls on the cotton plant. In the small-plot replicated tests, very early defoliation resulted in lower yields at both the TVREC and the EVSRC sites. Both sites matured a large crop in the top of the cotton plant in 2004 and required at least 50 to 60 percent open bolls before defoliation. Cotton quality at the EVSRC site determined that micronaire was lowered by the addition of a boll opener at defoliation. Staple length was reduced by the very early defoliation treatments, but strength values were slightly increased. Other quality factors were not affected by the defoliation treatments.

From data collected in 2003 and 2004, it appears the Hal-Lewis method may be very useful in determining possible cotton micronaire problems. In both seasons it accurately predicted lower-than-normal micronaire values. It also accurately predicted that certain varieties should be defoliated later than normal to avoid low-micronaire discounts. The data have shown that cotton defoliation is a balancing act between yield and quality. Early defoliation can result in much lower cotton yields and should be done with extreme caution. The Hal-Lewis method provides one more tool for Alabama cotton farmers to make better cotton management decisions.

Table 2. Effect of Defoliation Timing on Cotton Yields, TVREC, 2004

TIMING	LINT YIELD (*lb/a*)*
33% no opener	1,145 b
33% with opener	1,200 ab
53% no opener	1,259 ab
53% with opener	1,248 ab
65% no opener	1,224 ab
65% with opener	1,310 a
70% no opener	1,224 ab
70% with opener	1,231 ab

*Means followed by the same letter do not significantly differ (P=.10 DNMRT)

Table 3. Effect of Defoliation Timing on Cotton Yield, Staple, and Strength, EVSRC, 2004

TIMING	LINT YIELD (*lb/a*)	STAPLE	STRENGTH g/tex
24% open	851	34.0	30.1
35% open	806	34.0	30.4
69% open	923	34.7	28.7
81% open	927	33.3	28.8
LSD (0.05)	70	0.7	1.0

NEMATICIDES

EVALUATION OF TEMIK 15G AND NEW EXPERIMENTAL COMPOUNDS FOR ROOT-KNOT NEMATODE MANAGEMENT IN COTTON IN CENTRAL ALABAMA, 2004

K.S. Lawrence and S.R. Usery

Temik 15G and two numbered compounds were evaluated for the management of the reniform nematode (Meloidogyne incognita) in a naturally infested field at 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 sandy loam. Temik 15G and the experimentals were applied at planting on April 28 in the seed furrow with chemical granular applicators attached to the planter. Sidedress applications of Temik 15G and KC 791230 were made at the pinhead square growth stage. Terraclor Super X 18.8G (5.5 pounds per acre) was applied at planting to all treatments. Plots consisted of two rows, 25 feet long, with a 36-inch-wide 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 root-knot nematode were determined at three time intervals throughout the season. Ten soil cores, one inch in diameter and eight inches deep, were collected from the two center rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested September 14. Data were statistically analyzed by GLM and means compared using Fisher's protected least-significant-difference test (P<0.05).

Root-knot nematode disease pressure was moderate in 2004. Pre-plant populations of root-knot nematodes averaged 25 juveniles per 150 cubic centimeters (cm3)

Effect of Two Experimental Compounds on Root-knot Nematode Populations and Seed Cotton Yield

NEMATICIDE	RATE	APPLICATION	*MELOIDOGYNE INCOGNITA*/150 cm^3 OF SOIL				SEED COTTON (*lb/A*)	SEED COTTON OVER CONTROL
			30 DAP*	60 DAP	148 DAP	SEASON TOTAL		
Control	----	77.3	300.4	639.5	1,016	3,077.4		
Temik 15G	5 lb/A	plant	115.9	218.9	454.9	787	3,311.4	234
KC 03RCC002P053	5 lb/A	plant	107.3	115.9	240.3	462	3,331.5	254
KC 791230	5 lb/A	plant	94.4	223.2	622.3	939	3,287.2	209
KC 03RCC002P053 + Temik 15 G	5 + 5 lb/A	plant + PHS	90.1	128.8	746.8	964	3,892.2	814
KC 03RCC002P053 + KC 791230	5 + 5 lb/A	plant + PHS	55.8	201.7	446.3	702	3,682.4	605
LSD (P=0.05)			62.7	201.5	845.9		1,267.3	

*DAP = Days after planting.

of soil and increased to more than 700 nematodes per 150 cm3 of soil throughout the season. No differences in root-knot nematode populations (P=0.05) were observed through out the season; however, all nematicide treatments reduced root-knot numbers numerically compared to the control. Cotton seed yields were numerically increased an average of 315 pounds per acre in all nematicide treatments as compared to the control. The sidedress application at PHS increase yield by an average of 709 pounds per acre.

EVALUATION OF RECOMMENDED AND EXPERIMENTAL COMPOUNDS FOR RENIFORM NEMATODE MANAGEMENT IN COTTON IN NORTH ALABAMA, 2004

K.S. Lawrence, S.R. Usery, and C.H. Burmester

Vydate C-LV, Temik 15G, and N-Hibit were evaluated for the management of the reniform nematode (Rotylenchulus reniformis) in a naturally infested field adjacent to 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 silty clay loam. Vydate C-LV was applied as a broadcast foliar spray at the fifth true-leaf stage on June 5 with an air-charged modified plot sprayer delivering 10 gallons per acre through four 8003 flat-fan nozzles at 40 psi. All rows not treated with Vydate C-LV received a foliar spray of Orthene 90S at 0.3 pounds per acre. Temik 15G (5.0 pounds per acre) was applied at planting April 29 in the seed furrow with chemical granular applicators attached to the planter. N-Hibit was applied to the seed before planting. Terraclor Super X 18.8G (5.5 pounds per acre) was applied at planting to all treatments.

Plots consisted of two rows, 25 feet long, with a 40-inch-wide row spacing and were arranged in a randomized complete block design with five replications. Blocks were separated by a 15-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 four time intervals throughout the season. Ten soil cores, one inch in diameter and eight inches deep, were collected from the two center rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested October 5. Data were statistically analyzed by GLM and means compared using Fisher's protected least-significant-difference test (P = 0.05).

Reniform nematode disease pressure was low in 2004. Pre-plant populations of reniform nematodes averaged 167 nematodes per 150 cubic centimeters (cm3) of soil and increased to more than 800 nematodes per 150 cm3 of soil throughout the season (see table). No differences in reniform nematode populations were observed throughout the season; however, Vydate CLV numbers were numerically lower after compared to Temik 15G, N-Hibit, and Cruiser at 96 and 154 days after planting. Cotton seed yields were numerically increased an average of 175 pounds per acre in all nematicide treatments as compared to the control.

Effect of Vydate, Temik 15G, and N-Hibit on Reniform Levels and Seed Cotton Yields

NEMATICIDE	RATE	APPLICATION TIMING	*ROTYLENCHULUS RENIFORMIS* /150 cm^3 SOIL					SEED COTTON (LB/A)	SEED COTTON OVER CONTROL
			30 DAP*	62 DAP	96 DAP	154 DAP	SEASON TOTAL		
Cruiser	----	----	257.5	355.4	705.6	504.7	1,821	3,997.9	
Vydate C-LV	17oz	4th leaf	252.4	355.4	602.6	386.3	1,595	4,128.6	130.7
Temik 15G	5 lb/A	at plant	370.8	479	803.4	618	2,270	4,215.3	217.4
N-Hibit	3oz/cwt	at plant	375.9	494.4	803.4	556.2	2,228	4,175.6	177.7
LSD (P = 0.05)			189.2	589.8	535.9	437.9	1,225	450.9	

*DAP = Days after planting

EVALUATION OF TELONE II, VAPAM HL, AND TEMIK 15G FOR RENIFORM NEMATODE MANAGEMENT IN COTTON IN NORTH ALABAMA, 2004

K.S. Lawrence, S.R. Usery, C.H. Burmester, and G.W. Lawrence

Telone II, Vapam HL, and Temik 15G were evaluated for the management of the reniform nematode (Rotylenchulus reniformis) in a naturally infested field adjacent to 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 silty clay loam.

Liquid fumigants were applied with a modified John Deere ripper hipper. A CO2-charged system was used to propel the fumigants through flow regulators mounted on stainless steel delivery tubes attached to the trailing edge of forward-swept chisels. The fumigants were injected 18 inches deep 21 days prior to planting with one chisel per row. Rows were immediately hipped with disk hillers to seal and prevent rapid loss of the fumigant. Temik 15G was applied at planting with granular chemical applicators attached to the planter. Di-syston 8EC was included as an insecticide-treated control. All plots were treated with Orthene 75S at four ounces per acre when thrips were detected in any plots. Terraclor Super X 18.8G (5.5 pounds per acre) was applied at planting to all treatments. Plots consisted of four rows, 25 feet long, with a 40-inch-wide row spacing and were arranged in a randomized complete block design with five replications. Blocks were separated by a 15-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 four time intervals throughout the season. Ten soil cores, one inch in diameter and eight inches deep, were collected from the two center rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested October 5. Data were statistically analyzed by GLM and means compared using Fisher's protected least-significant-difference test (P>0.05).

Reniform nematode disease pressure was low in 2004. Pre-plant populations of reniform nematodes averaged 180 nematodes per 150 cubic centimeters (cm3) of soil and increased to more than 2,200 nematodes per 150 cm3 of soil by harvest (see the table). No differences in reniform nematode populations were observed at 30, 62, and 96 days after planting. At harvest, reniform populations were lower (P=0.05) in the Telone II three gallon per acre plots as compared to the Temik 15G plots.   Seed cotton yields were greater in the Telone II plots as compare to the control (P=0.05). However, cotton seed yields were numerically increased an average of 222 pounds per acre in all nematicide treatments as compared to the control.

Effect of Vapam, Temik 15 G, and Telone II on Reniform Nematode Levels and Seed Cotton Yields

Nematicide	Rate	Application timing	Rotylenchulus reniformis/150 cm^3 of soil					Seed cotton (lb/A)	Seed cotton over control
			30 DAP*	62 DAP	96 DAP	154 DAP	Season total		
Control	----	----	227	1,118	1,133	1,607ab	3,858	4,273 b	
Vapam HL	3 GPA	14 DBP	67	1,112	834	1,900 ab	3,913	4,334 ab	61
Vapam HL	5 GPA	14 DBP	149	1,483	711	1,885 ab	4,228	4502 ab	229
Temik 15G	5.0 lb/A	at plant	129	1,360	1,282	2,209 a	4,980	4,416 ab	143
Telone II	1.5 GPA	14 DBP	72	1,375	1,174	1,561 ab	4,182	4,569 ab	296
Telone II	3 GPA	14 DBP	165	1,488	587	881 b	3,121	4,657 a	384
LSD (P<0.05)				191	974	837	1,180		362.3

*DAP = Days after planting

EVALUATION OF SEED TREATMENT NEMATICIDES FOR RENIFORM NEMATODE MANAGEMENT IN COTTON IN NORTH ALABAMA, 2004

K.S. Lawrence, S.R. Usery, C.H. Burmester, and G.W. Lawrence

The field used for this study had a history of reniform nematode infestation, and the soil type was a silty clay loam. All seed treatments were applied by the manufacturer. Temik 15G (5.0 and 7.0 pounds per acre) was applied at planting on April 29 in the seed furrow with chemical granular applicators attached to the planter. Terraclor Super X 18.8G (5.5 pounds per acre) was applied at planting to all treatments. Plots consisted of two rows, 25 feet long, with a 40-inch-wide row spacing and were arranged in a randomized complete block design with five replications. Blocks were separated by a 15-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 four time intervals throughout the season. Ten soil cores, one inch in diameter and eight inches deep, were collected from the two center rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested October 5. Data were statistically analyzed by GLM and means compared using Fisher's protected least-significant-difference test (P=0.05).

Reniform nematode disease pressure was low in 2004. Preplant populations of reniform nematodes averaged 150 nematodes per 150 cubic centimeters (cm3) of soil and increased to more than 700 nematodes per150 cm3 of soil by harvest. No differences in reniform nematode populations (P=0.05) due to nematicide treatment were observed at 30, 62, 96, or 154 days after planting (DAP) (see table), although reniform population season totals were numerically lower in the A14006-B experimental at the higher rate of 15.0 milligrams per 100 kilograms of seed compared to Temik 15G at seven

Efficacy of Experimental Seed Treatments on Reniform Nematode Populations and Seed Cotton Yield

NEMATICIDE	RATE 100 KG SEED	ROTYLENCHULUS RENIFORMIS/150 CM3 SOIL					SEED COTTON (LB/A)	SEED COTTON OVER STANDARD
		30 DAP*	62 DAP	96 DAP	154 DAP	SEASON TOTAL		
Dynasty 1.04 FS + Cruiser 5 FS	25.0 g + 34.0 mg	422.3	535.6	654.1	433	2,044	3,753.7 ab	
A14006-B + Dynasty 1.04 FS + Cruiser 5FS	25.0g + 34.0 mg + 12.0 mg	231.8	231.8	726.2	695	1,883	4,030.3 ab	277
A14006-B + Dynasty 1.04 FS +Cruiser 5 FS	25.0 g + 34.0 mg + 15.0 mg	509.9	324.5	350.2	711	1,895	3,747.4 a	283
Dynasty 1.04 FS + Temik 15G	25.0 g + 5 lb/A	309	247.2	540.8	386	1,482	3,914.7 ab	161
Dynasty 1.04 FS + Temik 15G	25.0 g + 7 lb/A	278.1	61.8	355.4	325	1,020	4,026.1 b	273
A14006-B + Dynasty 1.04 FS +Cruiser 5 FS + Temik 15G	25.0 g + 34.0 mg + 15.0 mg + 5 lb/A	293.6	211.2	448.1	572	1,524	4,013.5 ab	260
LSD (P<0.05)		345.2	463	378.4	376		468.8	

*DAP = Days after planting

pounds per acre. Seed cotton yields in the nematicide treatments were not greater than the control (P=0.05); however, cotton seed yields were numerically increased an average of 250 pounds per acre in all nematicide treatments as compared to the control. The experimental A14006-B averaged over both rates numerically increase yield 119 pounds per acre as compared to Temik 15G at five pounds per acre.

FUNGICIDES

EVALUATION OF SELECTED FUNGICIDE SEED TREATMENTS FOR MANAGEMENT OF COTTON SEEDLING DISEASE IN CENTRAL ALABAMA, 2004

K.S. Lawrence, S.R. Usery, and D.P. Moore

This cotton fungicide test was planted April 12 at the Prattville Agricultural Research Unit in Prattville, Alabama. The objectives of this trial were to evaluate Dynasty CST, Systhane 40 WSP, Allegiance FL, RTU-Baytan-Thiram 1.76 FS, Ascend 30 2.64 EC, Baytan 30, Delta Coat AD 3.24 FS, and Protege FL1.9 LS in various combinations and rates for management seedling disease of cotton under high- and low-disease-pressure regimes. The field had a history of cotton seedling disease, and the soil type was a sandy loam (62.5, 22.5, 15; S-S-C, pH 6.5). Soil was 65oF at a four-inch depth at 10 a. m. with adequate moisture at planting. All seed treatment fungicides were applied by the manufacturer. Plots consisted of two rows, 30 feet long, with a 36-inch-wide row spacing and were arranged in a randomized complete block design with six replications. High-disease-

Efficacy of Selected Fungicide Seed Treatments on Cotton Stand, Uniformity, and Yield

TREATMENT	RATE 100 KG SEED	HIGH DISEASE PRESSURE			
		STAND PER 25-FT ROW		SKIP INDEX 42 DAP	SEED COTTON LB/A
		21 DAP*	42 DAP		
Check		34 e	39 c	18.7 a	1,290.7 ab
Dynasty CST 125FS	32 g	68.3 abc	62 ab	10.8 bc	1,411.7 a
Dynasty CST 125FS + Systhane 40 WSP	32 + 21 g	74.8 ab	63.5ab	13.3bc	1,403.6 a
Allegiance FL 318 SC + RTU-Baytan-Thiram 1.76FS	15 + 41 g	55.5 cd	45.7 bc	15.7 ab	1,242.3 b
Ascend 30 2.64EC + Allegiance FL + Baytan 30	19 + 15 + 10 g	65.8 abc	63.8 a	8.8 c	1,331 ab
Allegiance FL + RTU Baytan Thiram 1.76FS + Delta Coat AD 3.24 FS	15 + 41 + 300 g	75.1 ab	68.3 a	9.0 c	1,302.8 ab
Allegiance LS + RTU-Baytan-Thiram 1.76FS + Protege FL1.9 LS + Allegiance LS	15 + 41+ 8 + 15 g	80.3 a	62.8 ab	11.5 bc	1,306.8 ab
Allegiance LS + RTU-Baytan-Thiram 1.76FS + A13012 125FS	15 + 41 + 32 g	71.5 abc	56.3 abc	13.7 abc	1,326.9 ab
Allegiance LS + RTU-Baytan-Thiram 1.76FS + A13012 125FS + Systhane 40 WSP	15+ 41 + 32 +21 g	69.8 abc	50.8 abc	15.1 ab	1,391.5 a
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + A13012 125FS	15 + 41 + 1.35 g	67.8 abc	61.5 ab	13.5 abc	1,318.9 ab
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + A13012 125FS + Terraclor 10 GR	15 + 41 + 1.35 g + 2,500g/ac	61.5 bc	56.5 abc	12.3 bc	1,359.2 ab
LSD (P< 0.05)	17.6	18.0	5	137.8	

Efficacy of Selected Fungicide Seed Treatments on Cotton Stand, Uniformity, and Yield

TREATMENT	RATE 100 KG SEED	LOW DISEASE PRESSURE			
		STAND PER 25-FT ROW		SKIP INDEX 42 DAP	SEED COTTON LB/A
		21 DAP*	42 DAP		
Check		59.5 c	57.5 b	8.7 ab	1,391.5 d
Dynasty CST 125FS	32 g	71.1 abc	71.7 a	7.6 abc	1,577.0 abc
Dynasty CST 125FS + Systhane 40 WSP	32 + 21 g	78.6 a	69,2 ab	5.3 bc	1,528.6 a-d
Allegiance FL 318 SC + RTU-Baytan-Thiram 1.76FS	15 + 41 g	76.6 ab	72.0 a	7.3 abc	1,456.0 cd
Ascend 30 2.64EC + Allegiance FL + Baytan 30	19 + 15 + 10 g	75.5 ab	68.2 ab	8.8 c	1,532.6 a-d
Allegiance FL + RTU Baytan Thiram 1.76FS + Delta Coat AD 3.24 FS	15 + 41 + 300 g	75.8 ab	70.2 a	9.0 c	1,629.4 ab
Allegiance LS + RTU-Baytan-Thiram 1.76FS + Protege FL1.9 LS + Allegiance LS	15 + 41+ 8 + 15 g	62.1 abc	67.8 ab	6.5 abc	1,673.8 a
Allegiance LS + RTU-Baytan-Thiram 1.76FS + A13012 125FS	15 + 41 + 32 g	72.5 abc	71.2 a	8.0 abc	1,645.6 a
Allegiance LS + RTU-Baytan-Thiram 1.76FS + A13012 125FS + Systhane 40 WSP	15+ 41 + 32 +21 g	69.5 abc	68.3 ab	6.6 abc	1,633/5 ab
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + A13012 125FS	15 + 41 + 1.35 g	73.5 abc	74.2 a	6.6 abc	1,597.2 abc
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + A13012 125FS + Terraclor 10 GR	15 + 41 + 1.35 g + 2,500g/ac	79.1 a	73.2 a	6.5 abc	1,528.6 a-d
LSD (P< 0.05)		15.1	11.8	3.4	161.4

incidence plots were infested with millet seed inoculated with Pythium ultimum and Rhizoctonia solani. Blocks were separated by a 20-foot alley.

The nematicide Temik 15G (5.0 pounds per acre) was applied in-furrow at planting. 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 three and six weeks after planting to determine the percent seedling loss and stand density due to cotton seedling disease. Plots were harvested October 18. Data were statistically analyzed by GLM and means compared using Fisher's protected least-significant-difference test (P=0.05).

The 2004 season began with optimum environmental conditions but ended with repeated hurricanes. The environmental conditions for 10 days after planting (DAP) included average soil and air temperature maximums and minimums of 70, 45, 66.7, and 62o F and 0.75 inches of precipitation accumulated. Seedling disease incidence was severe in the inoculated plots and moderate in the non-inoculated plots. At 14 DAP under high disease pressure, all seed treatments increased plant stand as compared to the untreated control. However, by 28 DAP, Dynasty CST alone or with Systhane, Ascend 30 + Allegiance FL + Baytan 30, Allegiance LS + RTU-Baytan-Thiram alone or overcoated with Delta Coat AD, Protege FL, or A13012 125FS increased seedling stand over the control. These treatments also improved stand uniformity as indicated by the skip index. Dynasty CST alone or with Systhane and Allegiance LS + RTU-Baytan-Thiram + A13012 + Systhane produced significantly greater yields than the standard Allegiance FL 318 SC + RTU-Baytan-Thiram seed treatment.

In the non-inoculated or low-disease-pressure plots, Dynasty CST, Allegiance FL + RTU Baytan Thiram alone or with an over-treatment of Delta Coat AD, or A13012, or followed by an in-furrow application of A13012 125FS or Terraclor 10G improved seedling stand at 28 DAP as compared to the control. Allegiance

FL + RTU Baytan Thiram followed by Terraclor 10G in furrow improved stand uniformity as compared to the control. Seed cotton yields were increased over the control by Dyansty CST alone or with Systhane and Allegiance LS + RTU-Baytan-Thiram with an over-coat of Delta Coat AD, or Protege FL, or A13012, or A13012 + Systhane, or followed by an in-furrow application of A13012.

EVALUATION OF SELECTED FUNGICIDES FOR MANAGEMENT OF COTTON SEEDLING DISEASE IN THE TENNESSEE VALLEY REGION OF ALABAMA, 2004

K.S. Lawrence, S.R. Usery, and B.E. Norris

This cotton fungicide test was planted April 16 at the Tennessee Valley Research and Extension Center in Belle Mina, Alabama. The objectives of this trial were to evaluate Dynasty CST, Reason, Rovral CF, Ridomil Gold, and Quadris in various combinations for management of seedling disease of cotton under high and low disease-pressure regimes. The field had a history of cotton seedling disease, and the soil type was a Decatur silty loam. Soil was 65o F at four inches depth at 10 a.m. with adequate moisture at planting.

Fungicides were applied either as a seed treatment by the manufacturer or as an in-furrow spray application at planting. All in-furrow fungicide sprays were applied with flat-tip 8002E nozzles calibrated to deliver six gallons per acre at 18 pounds per square inch (psi). Plots consisted of two rows, 25 feet long, with a 40-inch-wide row spacing and were arranged in a randomized complete block design with five replications. High-disease-incidence plots were infested with millet seed inoculated with Pythium ultimum. Blocks were separated by a 20-foot alley.

The nematicide Temik 15G (5.0 pounds per acre) was applied in-furrow at planting. 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 two and four weeks after planting to determine the percent seedling loss and stand density due to cotton seedling disease. Plots were harvested September 23. Data were statistically analyzed by GLM and means compared using Fisher's protected least-significant-difference test (P<0.05).

The 2004 season began with optimum environmental conditions but ended with repeated hurricanes. The environmental conditions for 10 days after planting (DAP) included average soil and air temperature maximums and minimums of 64.7, 58, 79.5, and 53.8 oF and 0.06 inches

Effect of Reason, Rovral, Ridomil Gold,and Quadris In-furrow Fungicide Combinations as Compared to Dynasty Seed Treatments for Cotton Stand, Uniformity, and Yield

TREATMENT	RATE	LOW DISEASE PRESSURE			
		STAND PER 25-FT ROW		SKIP INDEX 42 DAP	SEED COTTON (LB/A)
		14 DAP*	28 DAP		
Control		51	51.4 c	3.6	4,135.3
Dynasty CST 125 FS	32 g/100 kg seed	55.6	67.8 a	2.8	4,142.7
Reason + Rovral CF	0.5 + 0.5 oz/1,000 row ft	43.0	69.0 a	1.6	4,147.9
Ridomil Gold + Rovral CF	0.15 + 0.5 oz/1,000 row ft	47.6	55.4 bc	2.6	4,138.0
Quadris + Ridomil Gold	6.0 + 0.5 oz/1,000 row ft	34.8	62.6 ab	2.2	4,017.2
LSD (P<0.05)		20.9	8.4	3.4	309.2

*DAP = Days after planting

of precipitation accumulated. Seedling disease incidence was moderate. At 14 DAP, none of the fungicide treatments increased plant stand (P<0.05) as compared to the nontreated control. However, by 28 DAP, Dynasty CST, Reason + Rovral CF, and Quadris + Ridoml Gold increased seedling stand (P<0.05) over the control. The skip index indicating an evenly spaced seedling stand was similar between all of the treatments. No differences in seed cotton yields were observed between the fungicide treatments and the nontreated control.

EVALUATION OF SELECTED FUNGICIDE SEED TREATMENTS FOR MANAGEMENT OF COTTON SEEDLING DISEASE IN THE TENNESSEE VALLEY REGION OF ALABAMA, 2004

K.S. Lawrence, S.R. Usery, and B.E. Norris

This cotton fungicide test was planted April 16 at the Tennessee Valley Research and Extension Center in Belle Mina, Alabama. The objectives of this trial were to evaluate Dynasty CST, Systhane 40 WSP, Allegiance FL, RTU-Baytan-Thiram 1.76 FS, Ascend 30 2.64 EC, Baytan 30, Delta Coat AD 3.24 FS, and Protege FL1.9 LS in various combinations and rates for management of seedling disease of cotton under high and low disease-pressure regimes. The field had a history of cotton seedling disease, and the soil type was a Decatur silty loam. Soil was 65o F at four inches in depth at 10 a.m. with adequate moisture at planting. All seed treatment

Efficacy of Selected Fungicide Seed Treatments on Cotton Stand, Uniformity, and Yield

TREATMENT	RATE 100 KG SEED	HIGH DISEASE PRESSURE			
		STAND PER 25-FT ROW		SKIP INDEX 42 DAP	SEED COTTON (LB/A)
		21 DAP*	42 DAP		
Control		10.8 cd	6.4 c	19.6 a	1,709.6 e
Dynasty CST 125 FS	32 g	26.2 bc	38.4 b	5 bcd	3,661.7 abcd
Dynasty CST 125 FS + Systhane 40 WSP	32 + 21 g	40.6 ab	54.6 a	5 bcd	3,786.1 abc
Allegiance FL + RTU-Baytan-Thiram 1.76 FS	15 + 41 g	25.8 bc	32.2 b	7 bc	3,447.9 cd
Ascend 30 2.64 EC + Allegiance FL + Baytan 30	19 + 15 + 10 g	27.6 b	33.4 b	8 b	3,506.9 bcd
Allegiance FL + RTU Baytan Thiram 1.76 FS + Delta Coat AD 3.24 FS	15 + 41 + 300 g	30.6 ab	57 a	5.2 bcd	3,833.2 ab
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + Protege FL1.9 LS + Allegiance LS	15 + 41+ 8 + 15 g	44.0 a	49.6 a	4.4 bcd	
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + A13012	15 + 41 + 32 g	38.0 ab		51.6 a	2.8 d
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + A13012 + Systhane 40 WSP	15 + 41 + 32 + 21 g	32.0 ab	59.2 a	3.2 cd	3,860.4 a
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + A13012	15 + 41 + 1.35 g	38.0 ab	34.4 b	7.8 b	3,478.2 cd
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + A13012 + Terraclor 10 GR	15 + 41 + 1.35 g 2,500 g/ac	35.8 ab		32.6 b	8.4 b
LSD (P<0.05)		16.335	10.325	4.158	338.3

fungicides were applied by the manufacturer. Plots consisted of two rows, 25 feet long, with a 40-inch-wide row spacing and were arranged in a randomized complete block design with five replications. High-disease-incidence plots were infested with millet seed inoculated with Pythium ultimum and Rhizoctonia solani. Blocks were separated by a 20-foot alley.

The nematicide Temik 15G (5.0 pounds per acre) was applied in-furrow at planting. 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 three and six weeks after planting to determine the percent seedling loss and stand density due to cotton seedling disease. Plots were harvested September 23. Data were statistically analyzed by GLM and means compared using Fisher's protected least-significant-difference test (P=0.05).

The 2004 season began with optimum environmental conditions but ended with repeated hurricanes. The environmental conditions for 10 days after planting (DAP) included an average soil and air temperature maximums and minimums of 64.7, 58, 79.5, and 53.8o F and 0.06 inches of precipitation accumulated. Seedling disease incidence was severe in the inoculated plots and moderate in the non-inoculated plots. At 21 and 42 DAP under high disease pressure, all seed treatments increased plant stand (P<0.05) as compared to the untreated control. At 42 DAP, Dynasty CST with Systhane, Allegiance LS + RTU-Baytan-Thiram overcoated with Delta Coat AD, Protege FL, and A13012 125FS increased seedling stand (P<0.05) over the Dynasty CST alone and the Allegiance FL + RTU Baytan Thiram alone. A lower skip index (P<0.05) indicating an evenly spaced seedling stand was observed in all the seed treatments. Seed cotton yield was also increased by all fungicides as compared to the

Efficacy of Selected Fungicide Seed Treatments on Cotton Stand, Uniformity, and Yield

TREATMENT	RATE 100 KG SEED	LOW DISEASE PRESSURE			
		STAND PER 25-FT ROW		SKIP INDEX 42 DAP	SEED COTTON (LB/A)
		21 DAP*	42 DAP		
Check		39.6 abc	53.4 c	5 ab	4,112.3
Dynasty CST 125 FS	32 g	47.6 abc	56.6 bc	1.4 b	4,023.5
Dynasty CST 125 FS + Systhane 40 WSP	32 + 21 g	53.4 ab	70.2 ab	0.8 b	4,146.3
Allegiance FL + RTU-Baytan-Thiram 1.7FS	15 + 41 g	36.6 bc	69.6 ab	0.6 b	4,086.7
Ascend 30 2.64 EC + Allegiance FL + Baytan 30	19 + 15 + 10 g	47.8 abc	69.4 b	2.6 b	4,141.1
Allegiance FL + RTU Baytan Thiram 1.76 FS + Delta Coat AD 3.24 FS	15 + 41 + 300 g	30.8 c	66.2 bc	3.2 b	4,119.7
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + Protege FL1.9 LS + Allegiance LS	15 + 41+ 8 + 15 g	58.6 a	66 abc	1.6 b	4,138.5
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + A13012	15 + 41 + 32 g	45.2 abc	77.6 a	0.4 b	4,132.2
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + A13012 + Systhane 40 WSP	15 + 41 + 32 + 21 g	41.8 bc	71.8 a	2.8 b	4,087.8
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + A13012	15 + 41 + 1.35 g	51.2 ab	9.2 ab	1.2 b	4,266.6
Allegiance LS + RTU-Baytan-Thiram 1.76 FS + A13012 + Terraclor 10 GR	15 + 41 + 1.35 g 2,500 g/ac	52.4 ab	70.8 ab	1.4 b	4,157.3
LSD (P<0.05)		20.15	15.02	4.7	250.31

*DAP = Days after planting

control. Yield was increased by 2,000 pounds of seed cotton per acre as compared to the control under high disease pressure.

In the non-inoculated or low disease-pressure plots, seedling stand was not increased (P<0.05) over the control at three weeks after planting. However, at six weeks after planting, seven of the seed treatments increased yield (P<0.05) over the nontreated control. All fungicide treatment produced a lower skip index (P<0.05) as compared to the control. Seed cotton yield was not increased as compared to the control under low disease pressure.

EVALUATION OF SELECTED IN-FURROW FUNGICIDES FOR MANAGEMENT OF COTTON SEEDLING DISEASE IN CENTRAL ALABAMA, 2004

K. S. Lawrence, S. R. Usery, and D. P. Moore

This cotton fungicide test was planted April 12 at the Prattville Agricultural Research Unit in Prattville, Alabama. The objectives of this trial were to evaluate Dynasty CST, Reason, Rovral CF, Ridomil Gold, and Quadris in various combinations for management of seedling disease of cotton under high-disease-pressure regimes. The field had a history of cotton seedling disease, and the soil type was a sandy loam (62.5, 22.5, 15; S-S-C, pH 6.5). Soil was 65oF at a four-inch depth at 10 a.m. with adequate moisture at planting. All seed treatment fungicides were applied by the manufacturer. Plots consisted of two rows, 30 feet long, with a 36-inch-wide row spacing and were arranged in a randomized complete block design with six replications. High disease incidence plots were infested with millet seed inoculated with Pythium ultimum. Blocks were separated by a 20-foot alley.

The nematicide Temik 15G (5.0 pounds per acre) was applied in-furrow at planting. 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 three and six weeks after planting to determine the percent seedling loss and stand density due to cotton seedling disease. Plots were harvested October 18. Data were statistically analyzed by GLM and means compared using Fisher's protected least-significant-difference test (P<0.05).

The 2004 season began with optimum environmental

Effect of Reason, Rovral, Ridomil Gold, and Quadris In-furrow Fungicide Combinations as Compared to Dynasty Seed Treatments for Cotton Stand, Uniformity, and Yield

TREATMENT	RATE	HIGH DISEASE PRESSURE			
		STAND PER 25-FT ROW		SKIP INDEX 42 DAP	SEED COTTON LB/A
		14 DAP*	28 DAP		
Control	85.5	74.3	7	1,480.2	
Dynasty CST 125 FS	32 g/100 kg seed	81.7	73.5	7.7	1,444.0
Reason + Rovral CF	0.5 + 0.5 oz/1,000 row ft	88.7	74.2	6.5	1,403.6
Ridomil Gold + Rovral CF	0.15 + 0.5 oz/1,000 row ft	80.0	75.8	7.0	1,480.2
Quadris + Ridomil Gold	6.0 + 0.5 oz/1,000 row ft	78.2	75.0	7.3	1,512.5
LSD (P<0.05)	17.1	12.3	3.5	127.3	

*DAP = Days after planting

conditions but ended with repeated hurricanes. The environmental conditions for 10 days after planting (DAP) included average soil and air temperature maximums and minimums of 64.7, 58, 79.5, 53.8° F and 0.06 inches of precipitation accumulated. Seedling disease incidence was light. At 21 and 42 DAP none of the fungicide treatments increased plant stand ($P<0.05$) as compared to the nontreated control. The skip index indicating an evenly spaced seedling stand was similar among all of the treatments. No differences in seed cotton yields were observed between the fungicide treatments and the nontreated control.