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Confidential Report

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VARIETY TRIALS

Cherokee County Cotton Variety Trial

C. H. Burmester and D. Derrick

Each season a cotton variety trial is conducted in Cherokee County to supplement yield results from the Alabama variety trials. This large cotton-growing area has unique soil types and farmers need these results to evaluate new cotton varieties for northeast Alabama. In 2005, the test was conducted on the farm of Randall and Nick McMichen on a Holston fine sandy loam soil. Cotton was planted no-till into a winter wheat cover crop on April 29. Cotton varieties were planted in a two-replication strip trial to reduce possible soil variability. Eight rows were harvested for yield from each variety and weighed using a boll buggy. The variety DP 444BG/RR was used as a check variety across the field.

A total of ten cotton varieties were planted in 2005. All varieties contained the Roundup Ready gene and received a glyposate herbicide application at the four-leaf stage. At harvest, cotton samples were taken for quality analysis. These samples were ginned on a tabletop gin for lint percentage and lint quality was determined by HVI analysis.

Excellent growing conditions in 2005 resulted in very high yields. Overall insect pressure was also very light, especially for plant bugs.

Yield and Quality of Cotton Varieties in the Cherokee County Trial, 2005

Variety	Seed cotton yield	Lint[1]	Lint yield	Mic.[2]	Length	Strength	Uniformity
	lb/ac	*pct*	*lb/ac*	*units*	*in*	*g/tex*	*pct*
DP445BG/RR	3363	0.4586	1542	4.20	1.12	27.8	83.9
DP 444BG/RR	3396	0.4517	1534	3.90	1.12	29.4	83.3
ST 5242BG	3245	0.4259	1382	4.10	1.11	28.2	83.8
PHY 480WR	3149	0.4318	1360	4.40	1.14	30.1	83.8
DP 454BG/RR	2974	0.4545	1352	3.90	1.14	29.4	84.0
FM 960BR	3074	0.4376	1345	3.80	1.15	33.8	83.6
DP 455BG/RR	2967	0.4477	1328	3.80	1.12	29.8	83.2
ST 5599BR	2993	0.4227	1265	4.20	1.14	31.8	82.9
FM 960B2R	2905	0.4244	1233	4.30	1.12	30.0	84.0
PHY 470WR	2549	0.4313	1099	—[3]	—	—	—

[1] Lint percent determined on a small gin without cleaners. This percentage is usually higher than normal turnout, but consistent between varieties. [2] Mic. = micronaire. [3] — = data missing.

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 planting early 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 might be more favorable, and cotton would potentially have a longer growing season, would have peak flowering during the longest summer days, and might set bolls before soil moisture supplies were depleted by hot weather. For northern areas, this might 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 at each of three planting dates. One variety of each type was an early maturing variety and the other a full season. Four replications of four, 40-inch rows in 25 foot long plots of each variety were planted on April 5, April 15, and April 27, using conventional tillage.

Fertility and pesticide applications were according to Alabama Cooperative Extension System recommendations. Cold (two 35°F nights) temperatures in late April slowed growth for emerging cotton. Harvest conditions were generally excellent.

Plots were defoliated, 100 boll-samples were hand-picked, and then plots harvested with a spindle picker on October 4. Seed cotton samples were ginned on a mini-gin for lint quality and turnout, and lint analyzed for quality by HVI at the USDA-AMS lab at Pelham, Alabama.

Yield and turnout results are presented in Table 1. Lint yields ranged from 741 to 942 pounds per acre. Lint turnout ranged from 38 to 43 percent.

Both planting dates and cultivars had significant effects on stands, with a lower number of plants for the first planting date and CT 110 HQ—a cold-tolerant cultivar—and FM 958 resulting in significantly better stands than the other two cultivars. Stands for FM 958 were also significantly better than the other three varieties at the two later planting dates.

Better stands and growing conditions for the last planting date resulted in better yields, although there was no significant difference in yields between cultivars planted on the same date. Factorial analysis indicated that there was no significant effect of planting date on lint turnout or quality measurements. There were significant differences between cultivars for most lint quality aspects (Table 2).

TABLE 1. LINT YIELDS AND PLANTING DATES OF COLD-TOLERANT VARIETIES, TVREC, 2005

Planting date	Cultivar	Stand *plants/50 ft*	Lint yield *lb/ac*	Turnout *pct*
1	CT 110 HQ	94	787	38
1	CT 212 HQ	62	794	39
1	FM 958	102	741	41
1	DP 491	72	750	42
2	CT 110 HQ	116	789	40
2	CT 212 HQ	116	876	39
2	FM 958	144	756	41
2	DP 491	102	777	42
3	CT 110 HQ	111	813	37
3	CT 212 HQ	104	928	40
3	FM 958	141	844	41
3	DP 491	104	942	43
LSD (P=0.10)		**18**	**136**	**2**

TABLE 2. LINT QUALITY AND PLANTING DATES OF COLD-TOLERANT VARIETIES, TVREC, 2005

Planting date	Cultivar	Mic.[1] *units*	Length *in*	Strength *g/tex*	Uniformity *pct*
1	CT 110 HQ	3.7	1.16	29.4	83.0
1	CT 212 HQ	4.2	1.09	30.1	82.2
1	FM 958	3.9	1.14	30.6	82.6
1	DP 491	4.1	1.14	29.9	81.8
2	CT 110 HQ	3.8	1.13	28.6	82.7
2	CT 212 HQ	3.8	1.11	29.3	83.2
2	FM 958	3.7	1.13	30.9	82.6
2	DP 491	3.9	1.17	31.0	83.1
3	CT 110 HQ	3.9	1.14	29.5	83.2
3	CT 212 HQ	4.6	1.08	29.0	81.5
3	FM 958	3.9	1.12	29.1	83.0
3	DP 491	4.2	1.17	32.9	83.1
LSD (P=0.10)		**0.3**	**0.05**	**1.9**	**1.4**

[1] Mic. = micronaire.

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 planting early 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 might be more favorable, and cotton would potentially have a longer growing season, would have peak flowering during the longest summer days, and might set bolls before soil moisture was depleted by hot weather. In south Alabama, this might 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. One variety of each type was an early maturing variety and the other a full season. Four replications of four, 40-inch rows in 25 foot long plots of each variety were planted on April 14, April 28, and May 12, using conventional tillage. Initial land preparation and planting was delayed by persistently saturated soils. More than 5.6 inches of rain in eight hours on April 30 affected the first and second planting dates. Several tropical storms, particularly Hurricane Katrina, also adversely affected the trial through excessive rainfall, lodging, and wind damage to open bolls.

Fertility and pesticide applications were according to Alabama Cooperative Extension System recommendations. Seed cotton samples were ginned on a mini-gin for lint quality and turnout, and lint analyzed for quality by HVI at the USDA-AMS lab at Pelham, Alabama.

In contrast to previous years, final plant stands were highest for all varieties for the first planting date, which had more favorable weather immediately after planting. Stands also improved from the tenth day after planting (DAP) to the 21 DAP for all planting dates, but was most dramatic for the first planting. CT 110 HQ, a cold-tolerant cultivar, and FM 958 had a higher stand count at 10 and 21 DAP than CT 212 HQ and DP 491 for the first planting dates, but results were less consistent for the second and third dates.

Yield and turnout results are presented in Table 1. Lint yields were highest for the second planting date, followed by the first and third dates (many open bolls from the first date were lost during Hurricane Katrina), ranging from 555 to 1062 pounds per acre. There was no significant main effect of variety on yield, but there was a significant interaction between planting dates and varieties.

Most lint quality factors were affected primarily by the cultivar, with little effect due to planting date or interactions between planting dates and cultivars (Table 2).

Table 1. Stand, Lint Yield, and Planting Dates of Cold-Tolerant Varieties, GCREC, 2005

Planting date	Cultivar	10 DAP[1]	21 DAP	Lint yield	Turnout
		—plants/60 ft—		*lb/ac*	*pct*
1	CT 110 HQ	35	124	749	40
1	CT 212 HQ	16	105	957	40
1	FM 958	43	135	760	36
1	DP 491	10	105	864	41
2	CT 110 HQ	65	88	1062	41
2	CT 212 HQ	47	71	586	37
2	FM 958	69	109	807	41
2	DP 491	56	96	987	41
3	CT 110 HQ	55	71	758	38
3	CT 212 HQ	31	63	908	41
3	FM 958	52	77	954	42
3	DP 491	27	53	555	37
LSD (P=0.10)		**14**	**16**	**135**	**1**

[1] DAP = days after planting.

Table 2. Lint Quality and Planting Dates of Cold-Tolerant Varieties, GCREC, 2005

Planting date	Cultivar	Mic.[1]	Length	Strength	Uniformity
		units	*in*	*g/tex*	*pct*
1	CT 110 HQ	4.1	1.15	31.8	83
1	CT 212 HQ	3.5	1.18	31.6	84
1	FM 958	3.5	1.16	33.6	82
1	DP 491	4.6	1.14	31.1	83
2	CT 110 HQ	4.0	1.14	31.3	83
2	CT 212 HQ	3.4	1.11	31.3	82
2	FM 958	4.6	1.17	32.9	84
2	DP 491	4.4	1.19	33.9	84
3	CT 110 HQ	4.0	1.12	33.1	82
3	CT 212 HQ	3.9	1.22	33.1	84
3	FM 958	3.9	1.21	32.4	84
3	DP 491	3.7	1.17	33.2	82
LSD (P=0.10)		**0.4**	**0.03**	**1.7**	**1**

[1] Mic. = micronaire.

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 planting early 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 might be more favorable, and cotton would potentially have a longer growing season, would have peak flowering during the longest summer days, and might set bolls before soil moisture supplies were depleted by hot weather. For northern areas, this might 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 at each of three planting dates. One variety of each type was an early maturing variety and the other a full season. Four replications of four, 36-inch rows in 28 foot long plots of each variety were planted on March 30, April 19, and May 3, using conventional tillage. Fertility and pesticide applications were according to Alabama Cooperative Extension System recommendations. Rainfall was plentiful through most of the early season, with cold and wet soils in late April causing damage to germinating cotton. Several three-week periods with little precipitation were experienced from mid-June through early July, mid-July to mid-August, and again in mid-September.

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 analyzed for quality by HVI at the USDA-AMS lab at Pelham, Alabama.

Results from stand counts, yield, and lint measurements are presented in Table 1. Harvested lint yields ranged from 1108 to 1657 pounds per acre. Lint turnout ranged from 38 to 42 percent

Stands were very low for the first planting date, with only one significant difference between varieties at 7 or 21 days after planting (DAP). Stands increased with each planting date, but the only other significant difference between varieties was found for the second planting date at the 7-day count. In both cases, FM 958 had a significantly better stand than some other varieties.

Planting date had a significant effect on yield, with yield increasing with the later planting dates. Variety choice had an effect on yield. Most lint quality measurements were significantly different for varieties, while micronaire was also significantly lower for the third planting (Table 2).

Table 1. Stand, Lint Yield, and Planting Dates of Cold-Tolerant Varieties, PARU, 2005

Planting date	Cultivar	7 DAP[1]	21 DAP	Lint yield	Turnout
		—plants/20 ft—		*lb/ac*	*pct*
1	CT 110 HQ	0.0	37.5	1317	40.0
1	CT 212 HQ	0.1	34.2	1399	39.0
1	FM 958	0.0	42.5	1317	41.0
1	DP 491	0.1	36.5	1108	42.0
2	CT 110 HQ	51.0	66.5	1521	40.0
2	CT 212 HQ	55.5	67.0	1481	41.0
2	FM 958	64.0	66.0	1404	41.0
2	DP 491	40.0	62.3	1392	38.0
3	CT 110 HQ	76.0	72.5	1450	39.0
3	CT 212 HQ	74.3	75.0	1441	39.0
3	FM 958	73.8	72.0	1513	40.0
3	DP 491	77.8	76.5	1657	42.0
LSD (P=0.10)		**6.3**	**7.8**	**213**	**2.4**

[1] DAP = days after planting.

Table 2. Lint Quality and Planting Dates of Cold-Tolerant Varieties, PARU, 2005

Planting date	Cultivar	Mic.[1]	Length	Strength	Uniformity
		units	*in*	*g/tex*	*pct*
1	CT 110 HQ	4.1	1.17	31.1	82.9
1	CT 212 HQ	4.1	1.13	29.7	82.5
1	FM 958	4.6	1.16	31.9	83.4
1	DP 491	4.2	1.20	30.9	83.0
2	CT 110 HQ	4.2	1.16	29.7	83.4
2	CT 212 HQ	4.4	1.15	31.4	83.7
2	FM 958	4.4	1.16	30.7	83.6
2	DP 491	4.1	1.21	32.5	83.4
3	CT 110 HQ	3.9	1.17	30.9	83.6
3	CT 212 HQ	3.7	1.14	30.9	83.2
3	FM 958	4.1	1.17	32.2	83.7
3	DP 491	4.0	1.22	32.1	83.9
LSD (P=0.10)		**0.3**	**0.02**	**1.3**	**0.7**

[1] Mic. = micronaire.

Evaluation of Cold-Tolerant and Conventional Cotton Varieties and Planting Dates at the Wiregrass Research and Extension Center

D. P. Delaney, C. D. Monks, B. Gamble, L. W. 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^{o}F for several days, which normally occurs after early April in much of the state. Producers planting early 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 might be more favorable, and cotton would potentially have a longer growing season, would have peak flowering during the longest summer days, and might set bolls before soil moisture was depleted by hot weather. In southeast Alabama, this might 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 at each of three planting dates. One variety of each type was designated by the respective seed company as an early maturing vareity and the other as a mid- to full season. Four replications of four, 36-inch rows in 20 foot long plots of each variety were planted on April 15, April 29, and May 16, using conventional tillage.

Fertility and pesticide applications were according to Alabama Cooperative Extension System recommendations. Rainfall was plentiful through most of the early season. Planting was delayed and germinating cotton damaged, particularly for the first two planting dates, due to often saturated soil conditions.

Plots were defoliated, and then harvested with a spindle picker on October 14. One-pound grab samples were ginned on a mini-gin for lint quality and turnout, and lint analyzed for quality by HVI at the USDA-AMS lab at Pelham, Alabama.

Due to wet field conditions in early spring, there was considerable variability in stand and yield measurements. The 7 day after planting (DAP) count decreased from the first to the last planting date, but the 21 DAP count increased with the last planting. (Table 1), There were some statistical differences in plant stands between varieties at the same planting date. Yields were statistically higher for the last planting date than the first two dates, likely due to less saturated soil after planting.

Lint quality was primarily affected by the cultivar, with no interactions between planting date and the cultivar. Micronaire was statistically higher for the first two plantings, compared to the last planting (Table 2).

Table 1. Stand, Lint Yield, and Planting Dates of Cold-Tolerant Varieties, WGREC, 2005

Planting date	Cultivar	7DAP[1]	21 DAP	Lint yield	Turnout
		—plants/40 ft—		*lb/ac*	*pct*
1	CT 110 HQ	77	79	886	42.3
1	CT 212 HQ	82	84	873	42.5
1	FM 958	83	92	610	42.3
1	DP 449 BG/RR	93	81	944	41.5
1	DP 444BG/RR	88	83	763	42.3
1	DP 491	83	76	819	47.0
2	CT 110 HQ	84	88	910	41.8
2	CT 212 HQ	77	81	1094	42.0
2	FM 958	72	81	905	42.3
2	DP 449 BG/RR	81	96	928	39.8
2	DP 444BG/RR	71	85	1081	42.5
2	DP 491	65	74	1037	43.8
3	CT 110 HQ	71	100	770	41.5
3	CT 212 HQ	68	102	934	42.5
3	FM 958	78	116	1080	41.5
3	DP 449 BG/RR	71	102	1004	41.8
3	DP 444BG/RR	83	119	970	42.8
3	DP 491	66	99	956	44.5
LSD (P=0.10)		**13**	**15**	**274**	**1.9**

[1] DAP = days after planting.

Table 2. Lint Quality and Planting Dates of Cold-Tolerant Varieties, WGREC, 2005

Planting date	Cultivar	Mic.[1]	Length	Strength	Uniformity
		units	*in*	*g/tex*	*pct*
1	CT 110 HQ	4.63	1.10	29.1	82.7
1	CT 212 HQ	5.07	1.03	28.9	81.9
1	FM 958	4.75	1.12	31.4	83.0
1	DP 449 BG/RR	4.65	1.06	31.1	83.2
1	DP 444BG/RR	4.55	1.06	29.5	82.1
1	DP 491	4.85	1.15	31.4	83.0
2	CT 110 HQ	4.66	1.10	28.8	82.8
2	CT 212 HQ	5.03	1.06	29.6	83.0
2	FM 958	4.80	1.12	32.3	83.8
2	DP 449 BG/RR	4.82	1.08	31.2	83.2
2	DP 444BG/RR	4.45	1.08	29.5	83.5
2	DP 491	4.75	1.15	31.7	83.0
3	CT 110 HQ	4.75	1.09	28.8	82.7
3	CT 212 HQ	4.68	1.05	29.8	81.6
3	FM 958	4.63	1.13	32.0	83.6
3	DP 449 BG/RR	4.48	1.05	29.7	82.6
3	DP 444BG/RR	4.33	1.07	30.2	83.0
3	DP 491	4.45	1.15	31.2	83.2
LSD (P=0.10)		**0.23**	**0.03**	**1.4**	**1.0**

[1] Mic. = micronaire.

Commercial Cotton Varieties Screened for Fusarium Wilt Resistance, 2005

W. S. Gazaway and K. Glass

Fusarium wilt has been successfully controlled through the use of resistant varieties for the past 50 years. Some newer genetically engineered cotton varieties, which have been rushed to market, do not have good Fusarium wilt resistance. As a result, wilt has become a serious problem in wilt-infested fields where these varieties have been grown. The objective of this ongoing study is to rate commercial varieties currently being used in Alabama according to their susceptibility or resistance to Fusarium wilt. This information is now published in the Alabama Cotton IPM recommendations and in the Cotton Variety Report annually.

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 3.3 feet wide with 5-foot alleys. The test contained five replicates. Plants were first evaluated for wilt soon after they reach the first true leaf stage on June 24, 2005. Thereafter, plots were evaluated for wilt on a weekly basis throughout the growing season until just before harvest. Plants showing wilt symptoms were counted, removed and recorded on July 21, August 3, and August 25, 2005. A final count was made on September 15.

The relative susceptibility of commercial cotton varieties in the test is shown in the table. Most of the commercial varieties exhibited some resistance to Fusarium wilt when compared to the extremely susceptible Rowden variety. Delta Pine 491 and 444BG/RR appeared to be the most resistant over a three year period. Several FiberMax varieties also showed fairly good resistance to Fusarium wilt. Fusarium wilt resistance exhibited by these entries indicate that the National Fusarium Wilt screening program is effective. Fewer and fewer susceptible Fusarium wilt cotton varieties are coming into the market.

Commercial Cotton Varieties' Response to Fusarium Wilt

Cotton variety	——Percent Fusarium wilt——		
	2003	2004	2005
Rowden	61	79	68
Stoneville 4892BR	8	10	9
Phytogen 410RR	3	8	10
FiberMax 989BR	3	15	1
FiberMax 960BR	3	10	3
Delta Pine 555BG/RR	0	7	5
Stoneville 5599BR	1	2	6
Delta Pine 491	2	3	4
Delta Pine 444BG/RR	3	3	2
FiberMax 958LL	—[1]	59	18
Delta Pine 449BG/RR	—	5	7
Stoneville 5303R	—	5	3
Delta Pine 488BG/RR	—	3	5
Delta Pine 451BG/RR	0	1	—
Delta Pine 458BG/RR	3	—	—
FiberMax 1218BG/RR	3	—	—
SureGrow 215BG/RR	3	—	—
Deltapine 5690RR	2	—	—
FiberMax 991RR	1	—	—
Stoneville 4686R	—	—	3
FiberMax 991BR	—	—	1

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

Evaluation of Early Season Flex Roundup Ready Cotton Varieties for Response to Boll Rot Disease in Alabama, 2005

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

A cotton variety trial was planted on May 5 at the Auburn University, Gulf Coast Research and Extension Center, Fairhope, Alabama. The soil type was a Malbis fine sandy loam. Plots consisted of two rows, 25 feet long, with a between-row spacing of 38 inches. Plots were arranged in a randomized complete-block design with four replications. A 10-foot alley separated blocks.

Cotton boll rot was evaluated by recording the number of healthy bolls and diseased bolls from a 0.001 acre section within each plot. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Plots were harvested on September 19. Data were statistically analyzed using PROC GLM, and means were compared with Fisher's protected least significant difference test ($P \leq 0.10$).

Weather conditions were favorable for high incidence of boll rot because this area endured rains from two tropical storms, Arleen and Cindy, as well as three hurricanes, Dennis, Katrina, and Rita. The disease index for boll rot ranged from a high of 27.2 percent for DynaGro 2520 B2 RF to a low rating of 5.4 percent for PHY 485 WRF. Fifteen cultivars had less cotton boll rot ($P \leq 0.10$) as compared to DynaGro 2520 B2 RF and DP 108 RF which displayed the greatest disease indexes. Seed cotton yields varied between the high and lowest yielding varieties by 322 pounds per acre. No correlations were observed between seed cotton yield and boll rot disease incidence.

Disease Index, Seed Cotton Yield, and Percent Lint, Early Season Cotton Flex Varieties

Variety	Disease index[1] Sept. 16	Seed cotton *lb/ac*	Lint *pct*
STX 4554B2RF	21.3 ab	1167	0.41
CG 4020 B2RF	20.8 abc	1163	0.40
xBCG - 4630 - BBII/Flex	12.9 b-g	1137	0.40
CG 3020 B2RF	11.7 b-g	1113	0.41
Vigoro CX 621	6.7 fg	1049	0.40
xBCG - 1004 - BBII/Flex	18.6 a-d	1032	0.39
DP 117 B2RF	9.4 efg	1013	0.41
xBCG - 9124 - BBII/Flex	15.9 b-f	1005	0.40
DynaGro 2520 B2 RF	27.2 a	994	0.39
CG 3520 B2RF	18.8 a-d	988	0.38
PHY 415 RF	10.5 d-g	975	0.40
PHY 485 WRF	5.4 g	975	0.40
Fiber Max FM 960BR	13.0 b-g	973	0.39
Vigoro CX 601	16.0 b-f	968	0.38
PHY 425 RF	10.0 efg	969	0.41
PHY 475 WRF	14.1 b-g	964	0.41
STX 4664RF	11.2 c-g	959	0.41
xBCG - 4153 - BBII/Flex	9.5 efg	944	0.39
xBCG - 3255 - BBII/Flex	8.6 fg	941	0.38
xBCG - 4575 - BBII/Flex	7.1 fg	928	0.38
Deltapine DP 444BG/RR	11.0 c-g	922	0.41
DP 110 RF	10.7 d-g	896	0.39
DP 108 RF	26.9 a	895	0.40
DP 113 B2RF	20.8 abc	894	0.40
xBCG - 8391 - BBII/Flex	16.5 b-f	865	0.37
DynaGro 2100 B2 RF	20.0 a-d	845	0.37
LSD (0.10)	**9.9**	**83.8**	

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

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

EVALUATION OF EARLY SEASON COTTON VARIETIES FOR RESPONSE TO BOLL ROT DISEASE IN ALABAMA, 2005

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

A cotton variety trial was planted on May 5 at the Auburn University, Gulf Coast Research Research and Extension Center, Fairhope, Alabama. The soil type was a Malbis fine sandy loam. Plots consisted of two rows, 25 feet long, with a between-row spacing of 38 inches. Plots were arranged in a randomized complete-block design with four replications. A 10-foot alley separated blocks.

Cotton boll rot was evaluated by recording the number of healthy bolls and diseased bolls from a 0.001 acre section within each plot. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Plots were harvested on September 30. Data were statistically analyzed using PROC GLM, and means were compared with Fisher's protected least significant difference test ($P \leq 0.10$).

Weather conditions were favorable for high incidence of boll rot as this area endured rains from two tropical storms, Arleen and Cindy, as well as three hurricanes, Dennis, Katrina, and Rita. The disease index for boll rot ranged from a high of 37.6 percent for Deltapine DP 445BG/RR to a low rating of 22.4 percent for PhytoGen PHY 370WR. Seed cotton yields varied 361 pounds per acre between all the varieties. No correlations were observed between seed cotton yield and boll rot disease incidence.

DISEASE INDEX, SEED COTTON YIELD, AND PERCENT LINT, EARLY SEASON COTTON VARIETIES

Variety	Disease index[1] Sept. 16	Seed cotton *lb/ac*	Lint *pct*
PhytoGen PHY 310R	33.0 a-d	1105	0.42
Stoneville ST 5242BR	34.8 a-d	1016	0.38
Fiber Max FM 960RR	34.1 a-d	1012	0.37
Stoneville STX0416B2R	30.1 a-e	1010	0.37
Fiber Max FM 966LL	36.8 abc	1001	0.37
PhytoGen PHY 370WR	22.4 e	997	0.39
PhytoGen PHY 440W	26.2 de	985	0.38
Deltapine DPLX03X179R	27.3 b-e	955	0.41
PhytoGen PHY 410RR	32.6 a-e	939	0.37
Deltapine DP 555 BG/RR	31.1 a-e	937	0.40
Deltapine DP393	28.6 a-e	925	0.39
PhytoGen PH Y 470WR	26.7 cde	919	0.37
Stoneville ST4575BR	27.3 b-e	910	0.39
Deltapine DP 432 RR	29.3 a-e	907	0.37
Deltapine DP 434 RR	27.6 a-e	888	0.39
Fiber Max FM958LL	30.6 a-e	885	0.37
Deltapine DP 445BG/RR	37.6 a	878	0.39
PhytoGen PHY 480WR	25.6 de	822	0.36
Deltapine DP454BG/RR	28.4 a-e	813	0.41
Deltapine DPLX04Y170BR	34.4 a-d	801	0.41
Fiber Max FM 960B2R	32.9 a-d	795	0.38
Fiber Max FM 960BR	35.1 a-d	778	0.37
Stoneville ST 4686R	37.4 ab	775	0.39
Deltapine DP 424 BGII/RR	33.4 a-d	774	0.37
Deltapine DP 444BG/RR	26.7 cde	766	0.39
Deltapine DP 455BG/RR	33.5 a-d	744	0.40
LSD (0.10)	**10.2**	**175**	

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

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

Evaluation of Full Season Flex Roundup Ready Cotton Varieties for Response to Boll Rot Disease in Alabama, 2005

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

A cotton variety trial was planted on May 5 at the Auburn University, Gulf Coast Research Research and Extension Center, Fairhope, Alabama. The soil type was a Malbis fine sandy loam. Plots consisted of two rows, 25 feet long, with a between-row spacing of 38 inches. Plots were arranged in a randomized complete-block design with four replications. A 10-foot alley separated blocks.

Cotton boll rot was evaluated by recording the number of healthy bolls and diseased bolls from a 0.001 acre section within each plot. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Plots were harvested on September 19. Data were statistically analyzed using PROC GLM, and means were compared with Fisher's protected least significant difference test ($P \leq 0.10$).

Weather conditions were favorable for high incidence of boll rot as this area endured rains from two tropical storms, Arleen and Cindy, as well as three hurricanes, Dennis, Katrina, and Rita. The disease index for boll rot ranged from a high of 16.83 percent for STX 6611B2RF to a low rating of 5.34 percent for Deltapine DP 555 BG/RR. Deltapine DP 555 BG/RR and DP 147 RF had less cotton boll rot ($P \leq 0.10$) as compared to STX 6611B2RF, Stoneville ST 5599BR, and Deltapine DP 164 B2RF. Seed cotton yields varied only 84 pounds per acre between all varieties. No correlations were observed between seed cotton yield and boll rot disease incidence.

Disease Index, Seed Cotton Yield, and Percent Lint, Full Season Cotton Flex Varieties

Variety	Disease index[1] Sept. 16	Seed cotton *lb/ac*	Lint *pct*
Stoneville ST 4357B2RF	8.43	1039	0.40
Deltapine DP 555BG/RR	5.34	1018	0.43
Deltapine DP 164B2RF	15.19	987	0.40
Deltapine DP 167RF	14.46	832	0.40
Deltapine DP 143B2RF	10.89	883	0.39
Deltapine DP 156B2RF	11.57	973	0.41
Deltapine DP 147RF	5.65	921	0.39
Deltapine DP 152RF	10.19	813	0.38
Stoneville ST 5599BR	16.02	983	0.41
Stoneville STX 0414B2RF	12.48	987	0.38
Stoneville ST 5007B2RF	7.65	928	0.39
Stoneville STX 5885B2RF	11.71	908	0.37
Stoneville STX 6611B2RF	16.83	920	0.39
Stoneville ST 6622B2RF	5.72	955	0.41
LSD (0.10)	**9.66**	**67.5**	

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

Evaluation of Full Season Cotton Varieties for Response to Boll Rot Disease in Alabama, 2005

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

A cotton variety trial was planted May 5 at the Auburn University, Gulf Coast Research Research and Extension Center, Fairhope, Alabama. The soil type was a Malbis fine sandy loam. Plots consisted of two rows, 25 feet long, with a between-row spacing of 38 inches. Plots were arranged in a randomized complete-block design with four replications. A 10-foot alley separated blocks.

Cotton boll rot was evaluated by recording the number of healthy bolls and diseased bolls from a 0.001 acre section within each plot. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Plots were harvested on September 30. Data were statistically analyzed using PROC GLM, and means were compared with Fisher's protected least significant difference test ($P \leq 0.10$).

Weather conditions were favorable for high incidence of boll rot as this area endured rains from two tropical storms, Arleen and Cindy, as well as three hurricanes, Dennis, Katrina, and Rita. The disease index for boll rot ranged from a high of 18.7 percent for Fiber Max FM 989 BR to a low rating of 6.1 percent for PhytoGen PHY 510RR. Seed cotton yields varied 419 pounds per acre between all varieties. No correlations were observed between seed cotton yield and boll rot disease incidence.

Disease Index, Seed Cotton Yield, and Percent Lint, Full Season Cotton Varieties

Variety	Disease index[1] Sept. 16	Seed cotton *lb/ac*	Lint *pct*
Deltapine DP 454BG/RR	11.5	1141	0.42
Deltapine DP 455BG/RR	11.7	1024	0.41
Deltapine DP 543BGII/RR	7.5	989	0.38
Deltapine DPLX04Y170BR	7.3	969	0.40
Fiber Max FM 989BR	18.7	949	0.38
Fiber Max FM 989RR	9.0	929	0.38
Deltapine DP 449BG/RR	10.3	928	0.39
PhytoGen PHY 510RR	6.1	912	0.39
Stoneville ST 6636BR	11.8	912	0.37
Deltapine DPLX03X179R	6.8	910	0.41
Deltapine DP 555BG/RR	11.4	909	0.40
Deltapine DPLX05X648DR	13.4	883	0.41
Deltapine DP 445BG/RR	12.5	876	0.41
Stoneville ST 5303R	11.9	872	0.38
Fiber Max FM 960BR	8.5	868	0.38
Fiber Max FM 991BR	7.8	866	0.38
Deltapine DP 493	10.9	855	0.43
Deltapine DP 491	10.3	840	0.39
Deltapine DP 488BG/RR	15.9	839	0.38
Fiber Max FM 989B2R	15.6	835	0.36
Fiber Max FM 991B2R	10.9	821	0.37
Stoneville ST 5599BR	9.4	804	0.39
Stoneville ST 6848R	18.0	801	0.37
Deltapine DP 494RR	8.1	748	0.39
Fiber Max 991R	14.4	722	0.38
LSD (0.10)	**7.5**	**132.3**	

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

Enhancing Cotton Variety Selection

C. D. Monks, C. H. Burmester, W. C. Birdsong, D. P. Delaney, R. W. Goodman, D. Derrick, R. Petcher, L. Kuykendall, R. P. Yates, W. Griffith, R. Colquitt, J. Todd, and R. Beauchamp

Since the introduction of genetically engineered cotton in 1996, the selection of varieties available to producers has grown tremendously. While there are a few conventional, non-transgenic selections on the market, most companies have a large selection of genetically engineered varieties to offer. Universities provide testing of those varieties in small-plot research conducted across the Cotton Belt on agricultural experiment stations. While this information is useful to producers, there is a need to evaluate varieties in an on-farm systems approach to complement university and company trials. The Alabama Cotton Commission and Cotton Incorporated continue to fund on-farm research in the area of variety evaluation in an effort to provide timely information to our producers. Results from each successful location can be viewed at www.alabamacotton.com.

The primary objective of this study was to increase the knowledge about new cotton varieties by conducting systems trials where the appropriate technology was used on a production scale in farmer's field (i.e., where Roundup Ultra is applied to Roundup Ready varieties). Trial sites were selected to locate cotton variety trials in unique soil areas that differ from those soils found in the University cotton variety trials. Data collected included yield, turnout, and quality measurements for each variety. Systems trials were located in northeast, central, and south Alabama counties (Table 1).

While seven locations were initiated this season, five resulted in useable information. Due to heavy flooding early in the growing season, the Marengo County location was not harvested for data. While the Mobile County location was harvested and data recorded, damage from Hurricane Katrina made that yield information suspect and should not be used for valid comparisons (Table 2). Yields and fiber quality data are posted on-line at www.alabamacotton.com.

Results of the on-farm trials are presented in Tables 3 through 8.

Table 1. County Locations of Trial Sites and Contact Information

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

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

Table 2. County, Producer, and Plot Information

County	Producer	Planting date	Reps.	Rows/ ft plot	Harvest date
Barbour	Walt Corcoran	May 6	2	Variable	Nov. 11
Cherokee	Nick McMichen	April 29	1	4/ 1400	Oct. 12
Elmore	Sanford Peeples	April 26	4[1]	4/ 1500	Oct. 4
Mobile	Johnny Dorland	May 9	1	8/ —[2]	Oct. 12
Marengo	Roy Etheridge	May 16	1	4/ —[2]	—[2]
Shelby	Philip Barber	May 2	2[1]	4/ 1400	Oct. 15
Tuscaloosa	Forrest Wiggins	May 12	2[1]	6/ 1500	Nov. 9

[1] These replications were bulked at harvest. For example, the four strips in Elmore were bulked into two replications and the two strips in Shelby and Tuscaloosa Counties were bulked into one replication.
[2] Mobile and Marengo counties were not harvested due to flood damage early in the season.

Table 3. Elmore County On-Farm Cotton Trial, 2005[1]

Variety	Lint yield *lb/ac*	Turnout[2] *pct*	Mic.[3] *units*	Staple *in (32nds)*	Strength *g/tex*	Uniformity *pct*
DP 434RR	920	41	4.05	37.5	29.1	83.6
DP 445BG/RR	918	42	4.60	37.5	31.2	83.8
ST 4575BR	859	41	4.55	37.0	31.0	84.0
DP 455BG/RR	791	43	4.15	37.0	31.6	83.8
ST 4686RR	786	36	4.55	37.0	31.7	84.8
ST 6636BR	782	38	4.75	38.0	32.2	85.0
DP 454BG/RR	777	42	4.10	36.5	30.7	83.6
FM 991RR	773	38	4.90	37.0	31.5	84.1
FM 991BR	772	40	4.85	38.0	33.0	84.6
FM 960BR	756	39	4.55	36.5	32.4	83.1
DP 488BG/RR	732	41	4.55	38.0	31.0	83.7
DP 449BG/RR	726	39	4.50	37.0	32.9	84.6
DP 494RR	724	41	4.45	37.5	32.7	84.5
FM 960RR	724	39	3.95	37.0	30.0	83.6
DP 555BG/RR	723	41	4.85	36.5	30.4	83.4
PHY 470WR	714	40	4.15	36.5	31.1	84.6
PHY 510RR	710	39	4.60	36.5	32.6	83.9
PHY 410RR	706	39	4.50	37.0	29.6	85.1
ST 6848RR	690	38	4.85	37.0	32.4	84.6
ST 5599BR	688	39	4.60	37.0	30.6	82.9

[1] Plots were planted in two separate strips of four rows, approximately 1,330 to 1,700 feet per strip.
[2] Lint turnout was determined on a small gin without cleaners. This percentage is usually higher than normal turnout but is consistent for comparison between varieties.
[3] Mic. = micronaire.

TABLE 4. MOBILE COUNTY ON-FARM COTTON TRIAL, 2005[1]

Variety	Plot size[2]	Turnout[3]	Seed cotton yield	Lint cotton yield[4]
	ac	*pct*	*lb/ac*	*lb/ac*
DP 449BGRR [5]	0.85	0.40	1890	749
FM 991BR	0.82	0.39	1820	708
FM 960BR	0.76	0.40	1720	688
FM 991B2R	0.84	0.40	1730	686
DP 488BG/RR	0.87	0.41	1630	673
ST 5242BR	0.71	0.42	1600	665
ST 6636BR	0.74	0.40	1680	665
FM 960B2R	0.82	0.39	1700	658
ST 6848BR	0.75	0.39	1680	648
ST 5599BR	0.7	0.41	1420	580
DP 555BG/RR	0.88	0.43	1330	576
PHY 510R	0.76	0.40	1440	573
DP 555BG/RR [6]	0.89	0.43	990	428
PHY 470WR	0.68	0.40	1030	410

[1] Hurricane Katrina hit Grand Bay on August 29 and adversely affected this crop. The exact extent of the damage is unknown; however yields were affected. Therefore exercise caution when evaluating the following results. These data are for INFORMATIONAL PURPOSES ONLY and are not intended for publication.
[2] Each variety was planted in one strip eight rows wide.
[3] Lint turnout was determined on a small gin without cleaners. This percentage is usually higher than normal turnout but is consistent for comparison between varieties.
[4] Defoliated on September 28 and harvested on October 12, 2005.
[5] Temik (4 pounds per acre) was applied to all plots.
[6] Seeds were treated with Cruiser. No Temik was applied in furrow on this plot.

TABLE 5. SHELBY COUNTY ON-FARM COTTON TRIAL, 2005[1]

Variety	Turnout[2]	Lint yield	Mic.[3]	Staple	Strength	Uniformity
	pct	*lb/ac*	*units*	*in (32nds)*	*g/tex*	*pct*
DP 454BR	43	1084	3.7	36	30.1	83.3
DP 445BR	42	1081	3.9	37	31.2	84.2
FM 991BR	43	1074	4.2	36	30.6	81.9
DP 449BG/RR	43	1056	3.6	36	30.0	83.5
ST 4646B2R	46	1047	4.3	36	32.5	83.8
DP 555BG/RR (Temik)	42	1043	4.2	36	28.9	81.9
ST 4575BR	40	1040	4.2	36	30.8	83.4
DP 444BG/RR	43	1031	3.4	35	34.2	82.0
DP 488BG/RR	45	1018	4.2	37	31.0	82.3
DP 555BGRR (Cruiser)	40	995	4.2	36	28.9	81.9
CG 3520RF	42	983	3.9	37	27.7	82.5
ST 5599BR	43	968	4.2	36	30.2	83.5
DP 455BG/RR	39	964	3.8	37	32.5	82.7
CG 4020RF	38	963	3.5	38	28.6	83.2
CG 3020RF	42	942	3.7	36	27.8	83.9
DP 543B2R	42	930	4.4	36	30.5	81.6
FM 960BR	42	928	NA	NA	NA	NA
PHY 410R	41	915	4.2	36	32.5	83.8
PHY 510R	41	914	4.3	36	30.7	83.2
FM 960B2R	42	890	NA	NA	NA	NA
PHY 470WR	39	849	4.3	36	28.6	82.8
ST 5242BR	39	837	3.9	36	30.2	80.7

[1] Plots were planted in two separate strips of four rows, approximately 1,400 feet per strip. All plots received Temik in-furrow except where Cruiser is indicated.
[2] Lint turnout was determined on a small gin without cleaners. This percentage is usually higher than normal turnout but is consistent for comparison between varieties.
[3] Mic. = micronaire.

TABLE 6. TUSCALOOSA COUNTY ON-FARM COTTON TRIAL, 2005[1]

Variety	Turnout[2]	Lint yield	Mic.[3]	Staple	Strength	Uniformity
	pct	*lb/ac*	*units*	*in (32nds)*	*g/tex*	*pct*
DP 555BG/RR	47	1220	4.8	35	28.2	80.1
DP 444BG/RR	44	1175	4.4	35	29.4	82.6
PHY 470WR	42	1036	4.7	36	27.9	80.7
ST 4575BR	43	1006	4.8	35	27.8	83.3
DP 488BG/RR	41	1002	4.7	36	27.4	81.5
ST 4646B2R	42	947	5.0	34	27.4	83.5
PHY 410R	42	943	4.7	36	30.3	83.4
PHY 510R	43	893	5.0	35	28.2	80.7
ST 5242BR	42	786	4.5	33	26.3	79.9
ST 5599BR	43	728	5.0	34	27.7	81.4
FM 960BR	40	611	4.6	35	30.9	81.3

[1] Plots were planted in two separate strips of four rows, approximately 1,300 to 1,900 feet per strip.
[2] Lint turnout was determined on a small gin without cleaners. This percentage is usually higher than normal turnout but is consistent for comparison between varieties.
[3] Mic. = micronaire.

TABLE 7. CHEROKEE COUNTY ON-FARM COTTON TRIAL, 2005[1]

Variety	Seed cotton yield	Turnout[2]	Lint yield	Mic.[3]	Length	Strength	Uniformity
	lb/ac	*pct*	*lb/ac*	*units*	*in*	*g/tex*	*pct*
DP445BG/RR	3363	46	1542	4.2	1.12	27.8	83.9
DP 444BG/RR	3396	45	1534	3.9	1.12	29.4	83.3
ST 5242BG	3245	43	1382	4.1	1.11	28.2	83.8
PHY 480WR	3149	43	1360	4.4	1.14	30.1	83.8
DP 454BG/RR	2974	45	1352	3.9	1.14	29.4	84
FM 960BR	3074	44	1345	3.8	1.15	33.8	83.6
DP 455BG/RR	2967	45	1328	3.8	1.12	29.8	83.2
ST 5599BR	2993	42	1265	4.2	1.14	31.8	82.9
FM 960B2R	2905	42	1233	4.3	1.12	30	84
PHY 470WR	2549	43	1099	NA	NA	NA	NA

[1] Planting date was April 2, 2005; harvest date was October 12, 2005; no-till management. Plots were planted in two separate strips of each variety across the field; these were harvested and a single weight recorded.
[2] Lint turnout was determined on a small gin without cleaners. This percentage is usually higher than normal turnout but is consistent for comparison between varieties.
[3] Mic. = micronaire.

TABLE 8. BARBOUR COUNTY ON-FARM COTTON TRIAL, 2005[1]

Variety	Lint yield[2]	Variety	Lint yield[2]
	lb/ac		*lb/ac*
FM 991BR	1505	DP 445BG/RR	1283
ST 6636BR	1469	DP 454BG/RR	1277
DP 449BG/RR	1457	ST 4575BR	1266
ST 5599BR	1374	ST 6848RR	1251
DP 432RR	1373	PHY 470WR	1244
DP 555BG/RR	1362	ST 5242BR	1240
DP 488BG/RR	1361	DP 960B2R	1233
FM 991B2R	1360	PHY 410R	1191
DP 494RR	1349	FM 960RR	1186
DP 455BG/RR	1318	DP 432RR	1176
DP 444BG/RR	1316	ST 5303RR	1123
PHY 510R	1303	DP 5690RR	1098
DP 424B2RR	1303	ST 6686RR	1097
FM 960BR	1297	DP 543B2RR	1091
FM 991RR	1295	DP 434RR	1077

[1] Plots were planted in two separate strips of four rows of varying length.
[2] Lint yield was based on actual small gin turnout.

CROP PRODUCTION

Evaluation of Stance, a New Growth Regulator for Cotton

C. H. Burmester

Stance, a new cotton growth regulator, was evaluated against the standard growth regulator used on cotton (4 percent mepiquat chloride), which has various trade names such as Pix, Mepex, etc. Stance is a combination of mepiquat chloride (MC) plus cyclanilide. The test was located at the Tennessee Valley Research and Extension Center near Belle Mina, Alabama. Plots were four rows wide and 30 feet long. All treatments were replicated four times. Stoneville 5599BR was the cotton variety used in the test.

Treatments (see table) were applied at various cotton growth stages, including match-head square, pre-bloom, bloom, and cut-out. Height and node counts were taken through the season and nodes above white flower (NAWF) measurements were taken in early August. Plots were harvested in early October.

Results of this study indicate that the activity of Stance is much higher than MC. The 1.5 and 2.0 ounce rate of Stance was equivalent to applying 6.0 to 8.0 ounces of MC (see table). All treatments reduced cotton heights compared to the untreated check. The lower NAWF measurements in August for all treatments indicate both MC and Stance applications resulted in earlier cotton than the untreated check. Cotton yields were highest where multiple applications of MC and Stance were made at match-head square, pre-bloom, and bloom (see table). Cotton yields were reduced when MC and Stance applications where delayed until pre-bloom or bloom.

In this study the very vigorous early season growth of the ST5599BR cotton variety provided valuable information about the new cotton growth regulator, Stance. Stance performed similarly to the 4 percent MC standard. However, the effective rate of Stance in this study was only about 25 percent of the rate needed by 4 percent MC.

Effects of Mepiquat Chloride and Stance Growth Regulator Treatments on Cotton Height, NAWF, and Yield, TVREC, 2005

Product	Rate *(oz/ac)*				NAWF[1]	Height	Seed cotton
	ms[2]	pb[3]	bl[4]	co[5]	Aug.	Sept.	*lb/ac*
1) —	0	0	0	0	4.8	56.7	3193
2) 4% MC	0	8	8	0	3.3	44.5	3262
3) 4% MC	8	6	6	0	3.6	45.7	3522
4) Stance	1.5	1.5	1.5	0	3.8	47.8	3376
5) Stance	2	2	2	0	3.8	47.3	3466
6) Stance	1.5	2	2	0	4.0	48.0	3649
7) Stance	0	0	2.5	3	3.7	49.3	3240
8) 4% MC	0	0	12	12	3.8	48.9	3187
LSD (0.10)					**0.6**	**2.9**	**176**

[1] NAWF = nodes above white flower, [2] ms = matchhead square, [3] pb = prebloom, [4] bl = bloom, [5] co = cut-out.

Evaluation of Precision Strip Tillage for Alabama Farmers

C. H. Burmester

Conservation tillage is the primary system used by north Alabama farmers in producing cotton. Although the conservation tillage system may vary from farm to farm, most farmers have reduced or eliminated deep tillage and many use small grain cover crops to reduce soil compaction. In most cases the farmer will plant back into the old cotton row to avoid tire traffic compaction.

Evaluation of several conservation tillage fields in north Alabama has indicated a compacted soil layer developing at a depth of about 3 inches below the surface. Most of these compacted soil problems occurred on soils where a cover crop had not been used.

A six row Remlinger Precision Strip-Till unit was purchased to evaluate its use to reduce surface soil compaction. In December 2004 the unit was evaluated on approximately 300 acres in Lawrence County. Spring tillage with the Remlinger unit was planned for February and March in 2005. Soil conditions, however, during this period were too wet to effectively run this strip-till unit.

The Remlinger strip tillage unit was found to be very effective in eliminating surface compaction when the chisel shank was run at a 6-inch depth. Some problems with clogging were found early in November when cotton stalks were not brittle and would not flow through the parallel coulters.

The machine's actual tillage area was only 8 to 10 inches wide. Evaluations at cotton planting indicated the parallel coulters should be set to make a small bed to allow for winter soil settling. Running slightly beside the row also reduced clogging.

The Remlinger strip tillage unit proved effective. Cotton emerged rapidly and a good tap root developed on the cotton where the strip tillage was used. The machine could be run at eight miles per hour with good results. One suggestion was to add row cleaners to the front coulter to reduce residue going through the machine and reduce clogging. The row cleaners have been purchased for the 2006 season.

SUB-SURFACE DRIP IRRIGATION PLACEMENT AND IRRIGATION WATER REQUIREMENTS, TENNESSEE VALLEY RESEARCH AND EXTENSION CENTER

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

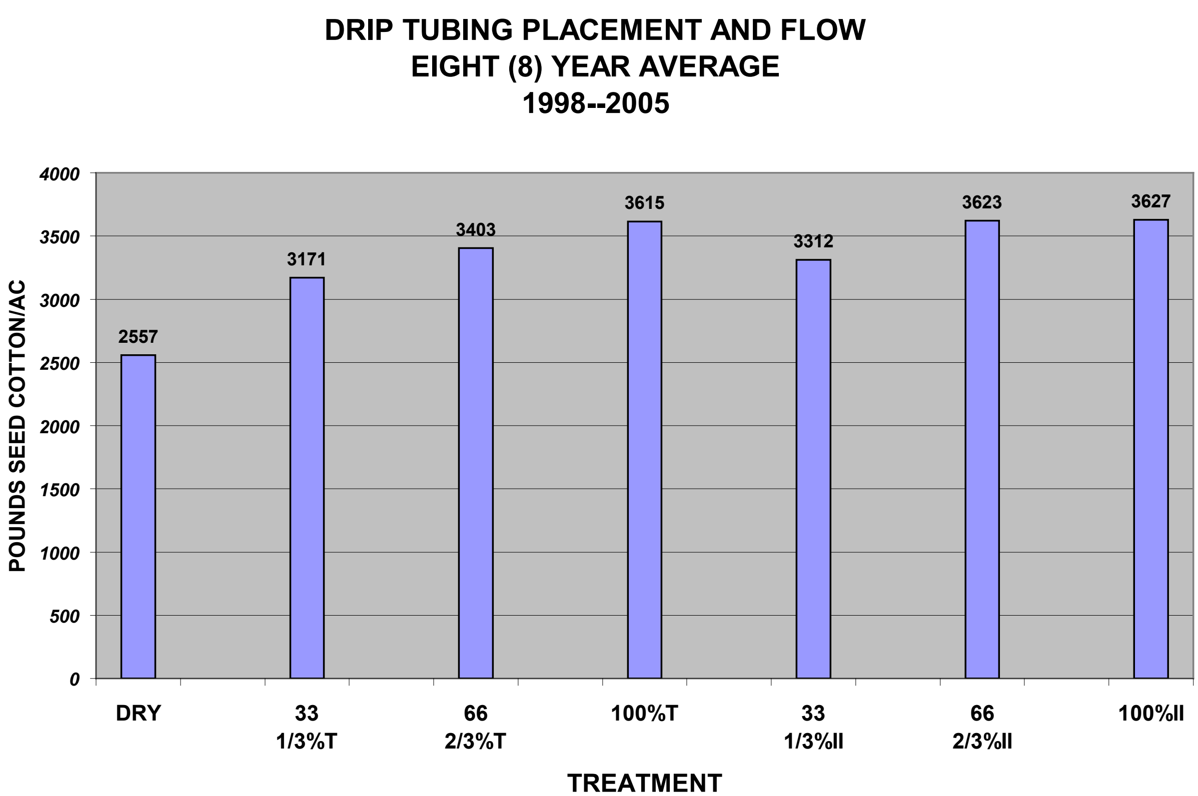
This experiment was initiated in 1998 to evaluate placement of sub-surface drip irrigation (SDI) relative to crop row direction and to evaluate water requirements for cotton production using SDI. Drip tubing was buried 15 inches deep with emitters at 2-foot intervals along the tubing. Tubing placement treatments were (1) between every other row—80 inch spacing between drip lines and (2) perpendicular to rows—80 inch spacing between drip lines.

Initially, irrigation treatment and plot operating times were based on planned 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. Field evaluation of operational conditions related to pressure and flow were conducted in 2005. The results of this evaluation indicated that a more realistic estimate of plot flow is plus or minus 10 percent of the 30-60-90 scheduling regime. This flow variability, due to plot operating pressure differences and plot elevation variability, led to the decision to change the control conditions to reflect a water management regime equal to 33.3 percent, 66.66 percent, and 100 percent of pan evaporation over the eight-year experiment. This operating regime reflects the minimum irrigation system design flow rate recommendations that would be acceptable based on the irrigation treatments and crop response.

Yields in 2005 were as follows:

- Non Irrigated—2548 pounds of seed cotton per acre,
- Perpendicular to row—33.3 percent pan, 2781 pounds of seed cotton per acre,
- Perpendicular to row—66.66 percent pan, 2614 pounds of seed cotton per acre,
- Perpendicular to row—100 percent pan, 3061 pounds of seed cotton per acre,
- Between every other row—33.3 percent pan, 3094 pounds of seed cotton per acre,
- Between every other row—66.66 percent pan, 2874 pounds of seed cotton per acre,
- Between every other row—100 percent pan, 3138 pounds of seed cotton per acre.

Average yield results for the eight-year experiment (1998 through 2005) are presented below. This is the final year for this experiment. A new proposal for this plot area is planned, beginning in 2006 through 2007.



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

L. M. Curtis, M. Dougherty, J. P. Fulton, 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 non-irrigated treatment. Irrigation was managed using soil moisture sensors and Moiscot (a spreadsheet-based scheduling method). The irrigation capabilities were (1) 1 inch every 12.5 days, (2) 1 inch every 6.3 days, (3) 1 inch every 4.2 days, and (4) 1 inch every 3.1 days. This 1-inch level represents the maximum amount of irrigation that could be applied in the time indicated. These irrigation capabilities are equivalent to 1.5, 3, 4.5, and 6 gallons per minute per acre.

The seven-year average results for each treatment are presented in Figure 1. Brief discussions of yields from 1999 through 2004 were presented in previous reports. Abundant rainfall occurred during much of the 2005 growing season. Overall yields in 2005 were lower than previous years for most irrigation treatments. Irrigation response was minimum for water applied during a dry period that occurred late in the growing season.

This is the final year of this project. A new proposal utilizing this sprinkler research plot area is being developed.

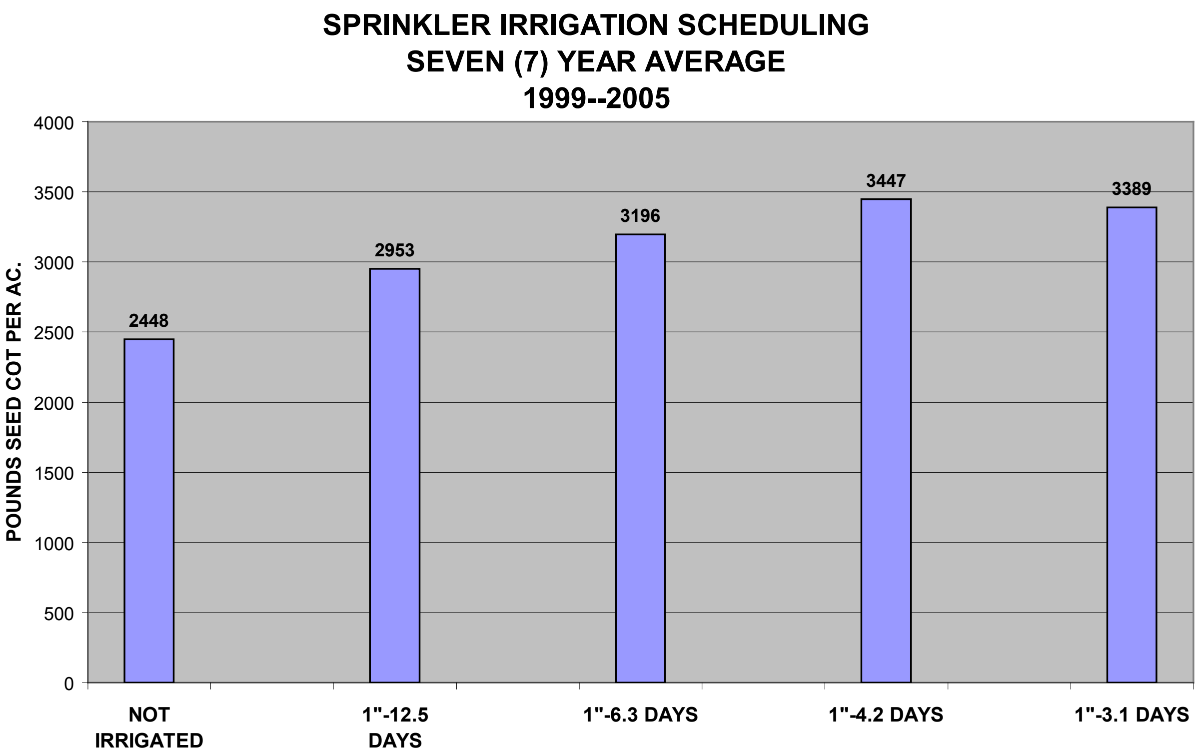


FIGURE 1--TREATMENT--IRRIGATION SYSTEM CAPABILITY

Evaluation of Variable-Rate Seeding for Cotton

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

The objective of this project is to evaluate opportunities for increased yield or profits through variable-rate (VR) seeding for cotton production.

A cooperative farmer was identified in Northern Alabama to conduct this on-farm study. This farmer utilizes a cotton and corn rotation while also having center pivot irrigation on a select portion of cropland. The existence of irrigation permitted the comparison of irrigated and dryland cotton production. Therefore, an irrigated and non-irrigated (dryland) field were selected to establish VR seeding plots within each field. Seeding rates, for both the dryland and irrigated fields, included 55,000, 65,000, 75,000, and 85,000 seeds per acre. These seeding rates were established based on the farmer's traditional seeding rates for the chosen cotton varieties and recommendations from consultants from the respective seed company with additional rates selected above and below the traditional seeding rate.

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

Subsequent to planting, stand counts were measured to determine the actual germinated population. These were collected by measuring the number of plants for two adjacent rows over a 10-foot length. Stand count measurements were gathered on each 12-row section of the planter, collecting counts at three or more places along each 12 rows depending upon terrain variability. A cotton picker equipped with an AgLeader yield monitor was used to obtain spatial performance data for the plots. Analyses included summarizing stand counts along with spatially segregating yields based on the various seeding treatments to determine the effect of seeding rate on cotton yields. All statistical analyses were conducted at a significance level of 0.05.

Poor growing conditions immediately following planting likely contributed to the final lower-than-expected plant populations. Weather directly following planting was not conducive to plant germination and emergence at the field sites. Before planting in the spring of 2006, a comparison of the actual planted rates to the prescription map is needed to ensure that the planter and VR control system are properly functioning. In terms of performance, no significant differences in cotton yields (pounds of seed cotton per acre) were found between the seeding treatments in either the dryland or irrigated plots (Tables 1 and 2). As expected, irrigated cotton yields were significantly higher than dryland cotton yields. Irrigated yields were around 60 percent or higher for the various treatments.

It should be noted that (1) results reported only represents the first year of this study, and (2) the effect of terrain and soil variables were not considered for this analysis. The inclusion of terrain attributes and soil variables could impact results because of yield differences between varying productivity areas. Future plans are to repeat this investigation in 2006 and consider the inclusion of terrain and soil variables in analyses.

Table 1. Field 1 Summary for Dryland Cotton

Treatment population *seed/ac*	Actual population *plants/ac*	Yield *lb seed cotton/ac*
55,000	16,597	1771 a
65,000	36,068	1843 a
75,000	41,876	1858 a
85,000	42,979	1811 a

Table 2. Field 2 Summary for Irrigated Cotton

Treatment population *seed/ac*	Actual population *plants/ac*	Seed cotton yield *lb/ac*
55,000	35,622	2792 b
65,000	43,318	3126 b
75,000	48,884	2985 b
85,000	50,191	3125 b

Crop Rotation to Manage Reniform Nematodes in Cotton

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

Cotton farmers have routinely used nematicides to control reniform nematodes. Although effective in the short-term, nematicides are expensive and do not always produce the desired economical returns. Since there are no reniform nematode resistant commercial cotton varieties, rotation with non-host crops provides the only reliable alternative for their management. Two previous rotation studies indicate that one-year and/or two-year corn or peanut rotations can effectively reduce reniform nematodes to a manageable population. Moreover, rotation with these non-host crops can have additional benefits by improving weed control, soil fertility, and soil texture. However, will the use of nematicides in cotton following a one-year or two-year rotation with peanut or corn improve cotton yields?

The purpose of this study is to determine (1) if a two-year rotation with corn. soybean, or peanut is superior to a one-year rotation, and (2) if a nematicide is profitable in cotton following a one year or a two-year rotation with corn, soybean, or peanut.

This multi-year project began in 2005. The project was placed in a cotton field heavily infested with reniform nematodes. The soil in this field, located near Huxford, Alabama, is a sandy, loam (56 percent sand, 29 percent silt, and 15 percent clay). Rotation/nematicide treatments are summarized in Table 1. The test was designed so that cotton following one- and two-year non-host rotations with non-host summer crops could be harvested and compared directly every year after the third year of cropping (see Table 1).The test was a split-plot design with the summer non-host crops as the primary factor and nematicides as the secondary factor. All non-host crop plots were 16 rows wide. These plots were split into eight-row subplots when cotton follows peanut, soybean, or corn. One of the two subplots was randomly selected and treated with a nematicide. The other subplot did not receive a nematicide. Continuous cotton plots were treated likewise with one subplot (eight rows) receiving a nematicide and the other remaining untreated. Plots were 40 feet long. The test was replicated four times. The entire field was planted in the winter of 2004 with a rye cover crop that was cut in the spring prior to planting the summer crops. The field was planted on raised beds spaced at 36-inch intervals. The nematicide, Temik 15G (5 pounds per acre), was placed in the seed furrow at planting to designated nematicide plots on May 10, 2005. Cotton seed (DP449BG/RR) were treated with the insecticide Cruiser for early season insect control. Soil samples for nematode analyses were collected from the two center rows of each eight-row subplot on May 10 just prior to planting and again in December after harvest. Corn (DynaGro 58K22RR), peanut (Georgia Green), and soybean (DP5915RR) were planted in the non-host plots the same day as cotton. Cotton was harvested from the two center rows of each cotton four-row subplot

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

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

[1] Each treatment was four rows wide. [2] N = nematicide treatment on cotton plots.

on October 10, 2005. Insect control, weed control, and all other agronomic practices were followed according to Auburn University recommendations.

Nematode populations for the test are presented in Table 2 and Table 3. Two series of soil samples were taken after harvest because the first set (not shown) of samples were too dry to give reliable results. A second set of samples (Table 2) were taken in December when the field had sufficient moisture. One growing season following peanut and corn was sufficient to lower reniform populations to a safe level (Table 3). Reniform populations following soybean and cotton, however, remained at a high level. The failure of soybean to lower reniform populations indicates that reniform resistance has been lost in these newer soybean varieties. Older soybean varieties, such as Centennial and Forrest, had excellent resistance and reduced populations as effectively as corn and peanut. Cotton yields from nematicide-treated cotton plots and non-treated plots were taken in 2005. Temik 15G produced a slight yield increase (Table 4). This small yield response could be attributed to excellent growing conditions throughout the 2005 growing season that allowed cotton to overcome much of the damage from reniform nematodes.

Table 2. Impact of Summer Non-host Crop Rotation and Cotton on Reniform Nematode Populations

Rotation scheme	Current crop	May 10	Dec.10
		——nemas/100 cc——	
1 Corn- 1 yr- nematicide	Cotton	281	1541
2 Corn-1 yr	Cotton	485	2306
3 Peanut-1 yr-nematicide	Cotton	676	1413
4 Peanut-1 yr	Cotton	434	1943
5 Soybean-1 yr-nematicide	Cotton	242	1676
6 Soybean-1 yr	Cotton	230	1696
7 Corn- 2 yr-nematicide	Corn	217	290
8 Corn- 2 yr	Corn	701	313
9 Peanut-2 yr-nematicide	Peanut	217	178
10 Peanut-2 yr	Peanut	293	224
11 Soybean- 2 yr-nematicide	Soybean	268	1214
12 Soybean- 2 yr	Soybean	293	1163
13 Cont. cotton- nematicide	Cotton	332	2484
14 Cont. cotton	Cotton	357	1794
15 Corn- 1 yr-nematicide	Corn	472	340
16 Corn- 1 yr	Corn	357	444
17 Peanut- 1 yr-nematicide	Peanut	179	390
18 Peanut- 1 yr	Peanut	293	358
19 Soybean- 1 yr-nematicide	Soybean	472	1096
20 Soybean- 1 yr	Soybean	357	1073
21 Corn- 2 yr-nematicide	Cotton	306	2078
22 Corn- 2 yr	Cotton	255	1886
23 Peanut- 2 yr-nematicide	Cotton	535	1675
24 Peanut- 2 yr	Cotton	446	1784
25 Soybean- 2 yr-nematicide	Cotton	370	970
26 Soybean- 2 yr	Cotton	242	1616
27 Corn- 2 yr- nematicide	Cotton	361	1687
28 Corn- 2 yr	Cotton	510	1506
29 Peanut- 2 yr-nematicide	Cotton	523	1868
30 Peanut- 2 yr	Cotton	395	1378
31 Soybean- 2 yr-nematicide	Cotton	230	1173
32 Soybean- 2 yr	Cotton	255	958

Table 3. Reniform Nematode Fall Populations Following one Year of Summer Crops, 2005

Crop	Reniform/100 cc soil
Peanut	288
Corn	347
Soybean	1287
Cotton	1591

Table 4. Cotton Yield Response to Temik 15G in Reniform-Infested soil

Cotton plots	Temik 15G *5 lb/ac*	No nematicide
	2443 a	2296 abc
	2550 abc	2021 bc
	2276 abc	2135 abc
	2124 abc	2134 abc
	2281 abc	2101 bc
	2294 abc	2327 ab
	2252 abc	2235 abc
	2180 abc	2086 bc
	1971 c	2053 bc
	2297 abc	2089 bc
Average	**2266.8**	**2147.7**
Increase	**+119.1**	

COTTON SYSTEMS RESERACH: EVALUATING HERBICIDE TECHNOLOGIES, TILLAGE SYSTEMS, AND ROW SPACINGS

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

The objective of this study was to evaluate the effects of two tillage systems, two row spacings, and three cotton varieties on yield, fiber quality, soil moisture, weed management, and economic returns. Cotton varieties, tillage systems, and row spacings were implemented at the Field Crops Unit of the E.V. Smith Research and Extension Center near Shorter, Alabama. Treatments were arranged in a split-split-plot design with four replications. Cotton varieties were conventional cotton (FM966®), RoundUp Ready (FM 960RR®), and Liberty Link (FM966 LL®). Tillage systems included either conventional tillage (fall chisel/disk, spring disk/level) with in-row subsoiling or no-tillage (fall paratilling). Row spacings were 40 inches or 15 inches. A rye cover crop was drilled across the experimental area on November 8, 2004 at 90 pounds per acre. All plots were paratilled (complete disruption) immediately following the cover crop planting operation to eliminate any shallow subsurface soil compaction. Typical spring in-row subsoiling prior to planting could not be administered to standard row (40-inch) cotton, because it would create a potential bias against 15-inch cotton.

On March 30, 20 pounds N per 0.001 acre, as NH_4NO_3, was applied to the cover crop to enhance biomass production. Biomass samples were collected from each plot on April 29, 2005, one day after chemical termination with RoundUp Ultramax® (32 ounces per acre). The average biomass production across the experimental site was 3040 pounds per acre. All plots received 68 pound N per acre as a starter in the form of NH_4NO_3 on May 13. All cotton varieties were planted on May 17, 2005 with an in-furrow application of Temik® (5 pounds per acre). Prowl® (32 ounces per acre) was applied pre-emergence to all conventional tillage plots and conventional varieties immediately following planting. Two over-the-top applications of Roundup Weathermax® (23 ounces per acre), Ignite® (32 ounces per acre), and Staple® (1.2 ounces per acre) were applied to corresponding herbicide tolerant and conventional varieties at the two-leaf (June 6) and four-leaf (June 16) stage. A layby application of Envoke® (0.15 ounce per acre) was applied to all 15-inch cotton on July 13, while a layby application of Caparol® (32 ounces per acre) and MSMA® (42.6 ounces per acre) was applied on the same day to the 40-inch cotton. Initial plant populations were recorded on June 6, 2005. The cotton was sidedressed with 60 pounds N per acre on June 7. One soil moisture probe was placed in every plot across three replications on June 10, 2005. The probes were connected to data loggers set to collect data every 30 minutes, which continued throughout the growing season until September 13, prior to defoliation. On August 2, 8 ounces per acre Pix Plus® was applied to all plots.

On July 6, 2005, whole plant biomass (1 square meter) were collected from each plot during squaring. This information was collected again from each plot on August 18, 2005. The second sampling time was planned for mid-bloom, but was delayed approximately one week. Unfortunately, access to a 15-inch spindle picker was not feasible, but cotton from sections within each plot were hand-harvested. Differences obtained for lint quality will likely be above typical averages, but any differences between treatments should be detectable. On September 28, the experiment was defoliated with Def 6® (1 pint per acre), Prep (1.5 pints per acre), and Dropp® (0.2 pound per acre). Cotton was hand-harvested on October 11.

Measured plant populations were 25 percent higher in the 15-inch compared to the 40-inch cotton (Table 1). However, due to differences between the drill and traditional planter units, initial seeding rates were 32 percent higher for the 15-inch cotton. Lint yields from the 15-inch cotton were increased 8 percent compared to the 40-inch cotton, while the conventional- and glyphosate-tolerant varieties produced approximately 13 percent more lint than the glufosinate tolerant variety (Table 1). This difference in lint yield can be partially explained by the lower turnout percentage of the glufosinate tolerant variety

TABLE 1. PLANT POPULATIONS, LINT YIELD, TURNOUT, SQUARING, AND MID BLOOM PLANT WEIGHTS MEASURED ACROSS ROW SPACINGS, VARIETIES, AND TILLAGE SYSTEMS, 2005[1]

	–Row spacing–		——Variety——			–Tillage system–	
	15 in	40 in	Conv	LL	RR	CT	NT
Population, *plants/ac*	64,195	51,204	57,320	61,242	54,536	50,782	64,617
Lint, *lb/ac*	1432	1321	1427	1270	1433	1372	1382
Outturn, *pct*	40.9	40.4	41.1	39.9	41.0	40.7	40.6
Squaring plant weight, *lb/ac*	1580	1350	1460	1494	1441	1357	1573
Mid-bloom plant weight, *lb/ac*	7790	6676	7041	7131	7527	7394	7073

[1] Research conducted at the Field Crops Unit of the E.V. Smith Research Center near Shorter, Alabama.

TABLE 2. SIGNIFICANCE LEVELS OF PLANT POPULATIONS, LINT YIELD, TURNOUT, SQUARING, AND MID BLOOM PLANT WEIGHTS FOR ROW SPACINGS, VARIETIES, TILLAGE SYSTEMS, AND THEIR INTERACTIONS, 2005[1]

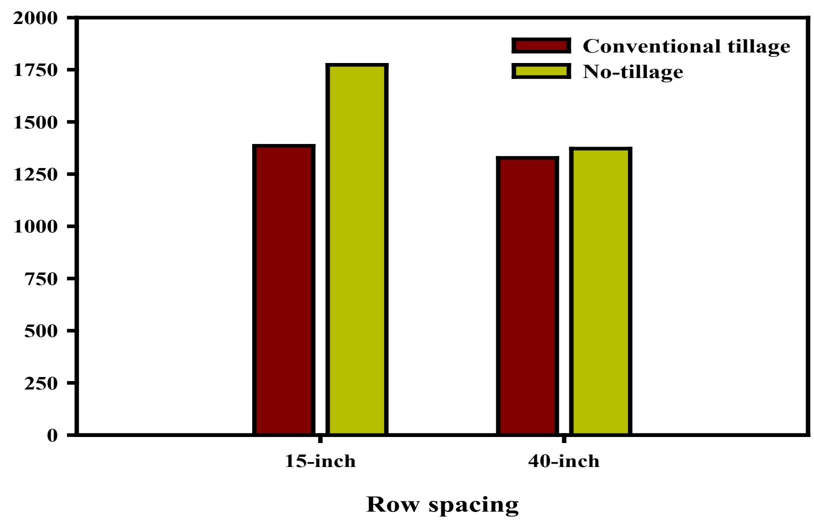
				——Plant weights——	
	Population	Lint	Turnout	Squaring	Mid-bloom
	--------------------	----------	*Pr > F*	----------	--------------------
Row Spacing	<.0001	0.0487	0.0221	0.0119	0.0014
Variety	NS[2]	0.0273	0.0002	NS	NS
Spacing x Variety	NS	NS	NS	NS	NS
Tillage	<.0001	NS	NS	0.0176	NS
Variety x Tillage	NS	NS	NS	NS	NS
Spacing x Tillage	NS	NS	NS	0.0552	NS
Spacing x Variety x Tillage	NS	NS	NS	NS	NS

[1] Research conducted at the Field Crops Unit of the E.V. Smith Research Center near Shorter, Alabama.
[2] NS = Not significant at 0.10 level of probability.

(39.9 percent) compared to the conventional- (41.1 percent) and glyphosate-tolerant variety (41.0 percent). It should be noted that although not significant, measured plant populations for the glufosinate tolerant variety were numerically higher than the other two varieties. However, this increase in plants per acre did not improve lint yields (Table 1). Row spacing and tillage system influenced plant weights measured at squaring (Table 2). The 15-inch cotton produced 17 percent more biomass than 40-inch cotton, while the no-tillage system produced 16 percent more biomass. However, an interaction was observed for plant weight at squaring between row spacing and tillage system (Table 2). Plant weights at squaring were similar for all row spacing and tillage combinations with the exception of no-tillage in the 15-inch row spacing (Fig. 1). Subsequent plant weights measured at mid-bloom were affected only by the row spacing with 15-inch cotton producing 17 percent more biomass than 40-inch cotton (Table 1). Fiber quality data and soil moisture data are still being summarized and analyzed statistically.

This experiment was showcased in a tour stop for an international delegation of approximately 20 researchers hosted by Tuskegee University on July 13, 2005.

Figure 1. Plant weights measured at squaring from two row spacings and two tillage systems at the Field Crops Unit of the E.V. Smith Research Center near Shorter, Alabama, in 2005.



The Old Rotation, 2005

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

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

The 110th year of The Old Rotation experiment continues the trend that began in 1996 when the experiment changed from conventional tillage to conservation tillage and GMO crops. Impressive yields of most crops were produced in 2005 with cotton lint yields on plot 9 producing an all-time record of 1660 pounds of lint per acre (Table 1). The Old Rotation averaged more than 2.1 tons of legume dry matter on those plots that were planted to AU Robin crimson clover in the fall of 2004. Based

Table 1. Crop Yields on the Old Rotation, 2005

Plot/Description	Clover dry matter	Wheat	Corn Irr.	Corn Non-irr.	Cotton Irr.	Cotton Non-irr.	Soybean Irr.	Soybean non-irr.
	lb/ac	*bu/ac*	*bu/ac*		*lint/ac*		*bu/ac*	
1 no N/no legume	0				520	550		
2 winter legume	4480				650	750		
3 winter legume	1700				690	1010		
4 cotton-corn	4840		62	34				
5 cotton-corn + N	5170		133	141				
6 no N/no legume	0				390	390		
7 cotton-corn	3400				770	1020		
8 winter legume	2950				740	790		
9 cotton-corn + N	4570				1210	1660		
10 3-year rotation	0				1060	850		
11 3-year rotation	6790		52	48				
12 3-year rotation	0	31.8					48.3	26.9
13 Cont. cotton/ no legume +N	0				720	1040		

upon an average N concentration of 1.77 percent, the winter legume contributed 75 pounds N per acre in the herbage.

This is the third year that irrigation on the Old Rotation could be compared with non-irrigated plots. A very wet growing season resulted in no apparent yield increase due to irrigation for corn and cotton. A very dry fall did result in a soybean yield response to irrigation. Comparing the three-year mean yields of corn and cotton with and without irrigation suggests that corn yields can be increased with irrigation whereas cotton yields have not indicated a dramatic yield response to irrigation at this central Alabama location (Table 2). Soybean on the three-year rotation averaged 51 bushels per acre with irrigation and 43 bushels per acre without irrigation since irrigation was established in 2003.

TABLE 2. EFFECTS OF IRRIGATION ON MEAN CROP YIELDS, OLD ROTATION, 2003-2005

Treatement (plots)	—Corn grain— Irr.	Non-irr.	—Cotton lint— Irr.	Non-irr.
	——bu/ac——		—lb lint/ac—	
No N/no legume (1,6)	—	—	440	380
Legume N only (8)	—	—	1020	1040
120 lb. N/acre (13)	—	—	1150	1190
2-yr rotation, legume N only (4,7)	67	56	1070	1080
2-yr rotation, +legume + 120 lb N/acre (5,9)	168	139	1340	1480
3-yr rotation, legume N only (10,11,12)	103	78	1180	870

2005 YIELDS ON THE CULLARS ROTATION (CIRCA 1911)

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

The Cullars Rotation is the oldest, continuous soil fertility experiment in the southern United States and the second oldest experiment in the world that includes cotton. It was placed on the National Register of Historical Places in 2003. It continues to document the long-term yield trends of five crops in a three-year rotation with 14 soil fertility variables. Each fertility treatment is replicated three times.

The 2005 growing season was characterized by a wet summer and very dry fall. On the Marvyn loamy sand where the Cullars Rotation is located, the wet season resulted in very good yields of corn and cotton (see table). All corn and cotton plots received 120 pounds total N per acre in split applications except on plots A, B, and C. The complete fertilizer plus micronutrient treatment produced almost the equivalent of three bales of cotton per acre. In spite of the dry fall, soybean yields were generally higher than the irrigated soybean yields on the nearby Old Rotation experiment. The 2005 yields continue a trend of high yields that seem to have begun about the time this experiment was converted from conventional tillage to conservation tillage in 1997. Conservation tillage includes either in-row subsoiling or paratilling prior to planting cotton and corn.

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

2005 CULLARS ROTATION YIELDS

Plot	Description	Clover dry matter *lb/ac*	Wheat *bu/ac*	Corn Non-irr. *bu/ac*	Cotton Non-irr. *lint/ac*	Soybean Non-irr. *bu/ac*
A	no N/+legume	2540	9.9	28	920	49.0
B	no N/no legume	—	10.9	27	750	52.0
C	nothing	0	0	0	0	0
1	no legume	—	33.4	109	1310	56.1
2	no P	1230	14.4	26	1290	0
3	complete	3990	40.8	151	1440	55.7
4	4/3 K	4210	26.7	148	1190	53.7
5	rock P	5710	41.1	144	1090	58.8
6	no K	2370	31.7	33	0	12.6
7	2/3 K	5640	45.8	172	1040	51.3
8	no lime	3560	7.5	26	70	0
9	no S	5620	39.1	144	1170	52.5
10	complete+ micros	4870	40.6	154	1490	53.8
11	1/3 K	4270	37.0	128	380	47.0

Comparison of Roundup Ready, Liberty-Link, and Conventional Weed Management Systems in Cotton, 2005

M. G. Patterson

Cotton trials were conducted in 2005 to compare Roundup Ready, Liberty Link, and conventional non-transgenic cotton weed management programs in both full till and no till systems. Trials were conducted at the Tennessee Valley Research and Extension Center, Belle Mina, Alabama, and the Wiregrass Research and Extension Center, Headland, Alabama.

A small grain cover crop was planted across each trial in the fall of 2004. Burndown herbicides (Roundup + 2, 4-D) were applied across the entire trial area in the spring of 2005. Land was prepared for planting at Belle Mina and at Headland during the month of March. Lime and fertilizer were applied to each experimental area for optimum cotton production. Roundup Ready (FM 960RR), Liberty-Link (FM 966 LL), and conventional (FM 966) cotton varieties were planted April 20 and May 5 at Belle Mina and Headland, respectively. Prowl was applied over the entire trial area prior to planting. Conventional tillage plots were tilled prior to planting all plots. Cotoran at 1.25 pounds per acre was applied preemergence to the conventional variety plots only. All three weed management systems were compared in both full till and reduced till culture. Roundup Original Max, Ignite, and Staple were applied to RR, LL, and conventional variety plots, respectively in mid May at Belle Mina, and late May at Headland. Envoke was applied over the entire trial at Headland in mid June and Poast was applied over the entire trial in late July. Envoke was applied to conventional plots only at Belle Mina. Layby treatments were applied in early July at both locations. The layby treatment at Belle Mina consisted of Layby Pro at 2 pints per acre plus MSMA at 2 pints per acre. The layby treatment at Headland consisted of Valor at 1.5 oz per acre plus Roundup Original Max at 22 fluid ounces per acre. Insect and disease control was maintained for optimum cotton production by Alabama Agricultural Experiment Station personnel at both research sites. Cotton was defoliated and harvested on October 5 at Belle Mina and on October 26 at Headland.

Late season weed control was equal and excellent for all six treatments at Belle Mina in 2005. No differences in seed cotton yield (trial average 2471 pounds per acre) were observed between any variety or tillage system (Table 1). Micronaire varied from 3.0 to 3.9 units. Strength was greater for FM 966 LL and FM 966 (> 32.3 g/tx) than for FM 960RR (average 30.6 gtx). Length varied from 1.06 to 1.11 inch. No differences in color grade were observed (avg 20.6). Leaf averaged 2.79.

Late season weed control was good for all treatments at Headland in 2005 (Table 2); however, annual grass control in RR treatments was slightly better than conventional herbicide treatments (94 vs. 90-91). Seed cotton yields averaged 3532 pounds per acre over the entire trial. Yield was lower for the conventional herb/full till treatment (3238 pounds per acre) than for the RR/no till treatment (3841 pounds per acre). Micronaire varied from 4.1 to 4.6 units. Strength was higher for FM 966 (avg 35.4 g/tx) than for FM 966 LL or FM 960RR (avg 32.6 g/tx). Length varied from 1.11 to 1.16 inch. Color grade averaged 23.5. Leaf averaged 3.08.

Table 1. Comparison of Roundup Ready, Liberty Link, and Conventional Weed Treatment Systems in Cotton, TVREC

Trt. no.	Treatment name	Grass control	Broadleaf control	Seed cotton	Mic.	Strength
		pct	*pct*	*lb/ac*	*units*	*g/tex*
		—Aug. 3, 2005—		*Oct. 5, 2005*	*—Dec. 16, 2005—*	
1	Roundup Ready No till	98	97	2501	3.0	30.8
2	Roundup Ready Full till	98	98	2644	3.4	30.5
3	Liberty-Link No till	98	98	2347	3.8	32.5
4	Liberty-Link Full till	98	98	2539	3.6	32.3
5	Conventional herb No till	98	98	2331	3.9	33.1
6	Conventional herb Full till	98	98	2463	3.7	33.3
LSD (P=.05)		**0.0**	**0.9**	**268.3**	**0.36**	**1.61**
Standard Deviation		**0.0**	**0.6**	**178.0**	**0.24**	**1.07**
CV		**0.0**	**0.63**	**7.2**	**6.76**	**3.33**

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

TABLE 2. COMPARISON OF ROUNDUP READY, LIBERTY LINK, AND CONVENTIONAL WEED TREATMENT SYSTEMS IN COTTON, WGREC

Trt. no.	Treatment name	Grass control	Broadleaf control	Seed cotton	Mic.	Strength
		pct	*pct*	*lb/ac*	*units*	*g/tex*
		—Aug. 3, 2005—		*Oct. 5, 2005*	*—Dec. 16, 2005—*	
1	Roundup Ready No till	94	94	3841	4.3	32.4
2	Roundup Ready Full till	94	94	3463	4.1	32.6
3	Liberty-Link No till	92	91	3554	4.5	32.2
4	Liberty-Link Full till	93	89	3557	4.6	33.3
5	Conventional herb No till	90	93	3543	4.6	35.7
6	Conventional herb Full till	91	94	3238	4.4	35.1
LSD (P=.05)		**3.6**	**5.8**	**498.5**	**0.36**	**1.75**
Standard Deviation		**2.3**	**3.8**	**330.8**	**0.24**	**1.16**
CV		**2.54**	**4.15**	**9.36**	**5.43**	**3.46**

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Tarnished Plant Bug Control in Cotton

B. L. Freeman

This trial compares the efficacy of numerous insecticides from several classes against tarnished plant bugs infesting cotton. The trial was conducted on the Tennessee Valley Research and Extension Center in Limestone County, Alabama. Cotton, ST 5242BR, was planted on April 19. Each treatment was replicated four times and plots were eight rows by 30 feet. The test area was under irrigation.

Plant bugs and their damage were regularly monitored by whole field visual and drop cloth samples until a decision to treat was made. Insecticides were applied on July 27 via ground equipment delivering 10 gallons per acre of finished spray solution. Control treatment populations of tarnished plant bugs and stink bugs were estimated on August 9 by making 6-foot drop cloth samples in each of the four plots. On August 25 a survey of all aged bolls was conducted to estimate the percentage of bolls with internal bug damage. At least 25 consecutive bolls were examined from each plot, but, in an effort to avoid spatial bias, the rest of the bolls from the plant containing the 25th boll were also sampled making the average sample size ca. 30 per plot. Worm-damaged bolls were also recorded from this sample. Seed cotton yields were determined on September 28 by mechanically harvesting the four center rows of each plot.

The test area was typical of most of north Alabama in that plant bug populations were slow in developing in 2005. The result was a mixed population of plant bug nymphs of all ages by the time threshold levels were reached. Plant bugs averaged 122 bugs per 100 row feet on July 28. August 9 samples from the control plots averaged 167 plant bugs and 21 stink bugs per 100 row feet.

Insecticide treatments reduced end-of-season levels of bug damaged bolls by 0 to 57 percent (see table). The Diamond + Orthene, Bidrin, Diamond, Orthene, Mustang Max, and Karate Z treatments all possessed less than 10 percent damage while the Centric, Venom, Carbine, Vydate, and Trimax treatments contained 11 to 14.41 percent damage (see table).

Seed Cotton Yield and Percent of Bug- and Worm-Damaged Bolls in Cotton, 2005

Insecticide	Rate	Bug-damaged bolls	Worm-damaged bolls	Seed cotton
	lb ai/ac	*pct*	*pct*	*lb/ac*
Diamond .83 EC +	0.039 +	6.14	7.02	4092
Orthene 97	0.33			
Bidrin 8 WM	0.25	7.14	1.59	4393
Diamond .83 EC	0.039	8.33	4.63	4099
Orthene 97	0.5	9.17	10.09	4228
Mustang Max .8 EC	0.0225	9.35	0.93	4126
Karate Z 2.09 CS	0.028	9.43	0.94	4224
Centric 40 WG	0.047	11.00	12.00	4358
Venom 20 W	0.13	11.30	6.09	3852
Carbine 50 WP	0.072	11.93	3.67	4198
Vydate 3.77 LV	0.33	12.96	1.85	3886
Control	—	14.29	5.88	3936
Trimax 4 SC	0.047	14.41	3.60	4076

Seed cotton yields are presented in the table and likely were impacted by bollworm damage. The percent of worm-damaged bolls, is also presented in the table. Despite considerable variation among treatments, only the two pyrethroids could have been expected to substantially reduce the bollworm population.

Plant bug damage to cotton has proven difficult to eliminate with insecticides, but a number of compounds that provide the necessary suppression for good yields are available.

SPIDER MITE CONTROL IN COTTON

B. L. Freeman

The two-spotted spider mite continues to be a troublesome pest for many cotton producers in north Alabama. Issues with acaracide resistance make product selection somewhat of a moving target. This trial was designed to compare the efficacy of several acaracides against the two-spotted spider mite on cotton.

The trial was conducted on the Tennessee Valley Regional Extension Center in Limestone County, Alabama. Treatments were applied to eight rows by 200 feet strips of cotton via ground equipment delivering 10 gallons of spray solution per acre. Applications were made on June 29. Mites were sampled by counting the number of mites in 1 square inch of lower leaf surface from an upper fully expanded leaf exhibiting moderate mite injury. Whole field pretreatment mite populations were estimated on June 29 by sampling 50 leaves. Post-treatment populations were estimated on July 5 and 8. A developing fungal epizootic prevented further post-treatment sampling.

The mite population on the day of application averaged 19.35 mites per square inch and the infestation was widespread. Some phytotoxicity was observed after the treatments of Comite II and Curacron. Post-treatment mite populations are presented in the table. Though Curacron and bifenthrin provided initial suppression of mites, only the Kelthane and Zeal treatments demonstrated acceptable suppression at six and nine days after treatment.

SPIDER MITES PER SQUARE INCH (PERCENT REDUCTION FROM CONTROL)

Treatment	Rate *lb ai/ac*	July 5 *no (pct)*	July 8 *no (pct)*
Kelthane 4F	1.0	0.07 (99.65)	1.00 (93.64)
Zeal 72 WP	0.045	2.67 (86.70)	1.00 (93.64)
Curacron 8E	0.75	1.33 (93.37)	8.00 (49.15)
Bifenthrin 2EC	0.1	4.40 (78.08)	15.13 (3.81)
Comite II 6EC	1.5	9.73 (51.52)	10.07 (36.02)
Lorsban 4 EC	0.5	15.60 (22.27)	13.53 (13.98)
Dimethoate 4 EC	0.5	19.33 (3.69)	12.07 (23.31)
Control	—	20.07 (—)	15.73 (—)

PRODUCTION AND CHARACTERIZATION OF BT RESISTANCE IN COTTON BOLLWORM, *HELICOVERPA ZEA*

W. J. Moar

Insecticide Resistance Management (IRM) strategies are preregistration requirements for Bt cotton. These strategies and recommendations are based, at least partly, on research results from Bt resistant insects. Although there has been substantial information arising from research dealing with Bt resistant tobacco budworm (TBW) and pink bollworm (PBW), little information has come from Bt resistant cotton bollworm (CBW). This lack of data from CBW is due, to a large extent, on the fact that there is no stable, highly Bt Cry1Ac-resistant CBW colony in the United States, although several labs, including our own, have tried for many years. The inability to establish a highly Cry1Ac-resistant and stable CBW population is thought to be caused primarily by inbreeding, although other factors are possible. One such factor could be that when insects are selected with Cry1Ac using the formulation MVPII containing only 19.1 percent AI, more than 80 percent of the selection against CBW using MVPII are non-Bt toxin components. Not only could selection be difficult to achieve, but resistant mechanisms arising from selection may not be resistant mechanisms specific to Bt. Additionally, because the Bt (Cry1Ac) that is present in Bollgard (Bt) cotton is not in the same form as that found in MVPII, laboratory selection using MVPII is not indicative of what is occurring in the field. The objective of this proposal is to use the form of Bt Cry1Ac found in Bollgard (Bt) cotton to select for Bt resistance, and to compare these results to a colony selected using MVPII.

A susceptible laboratory strain of CBW was established from a Monsanto laboratory colony. The baseline susceptibility of this strain to MVP II and Cry1Ac toxin was 24µg/g and 9µg/g diet, respectively representing about a 2.7-fold difference in susceptibility Subsequently, two Cry1Ac-resistant strains of CBW were selected using MVP II (MR) or activated Cry1Ac toxin (AR). Larvae that molted into second instar within seven days of selection were reared until pupation on regular diet (containing no Cry1Ac). Current resistant ratios for MR and AR strains are 12.6 and 35.9 fold after seven generations of selection, respectively. Selection studies indicated approximately three times quicker resistance development in the AR compared to the MR strain. Additionally, there were higher fitness costs in terms of fertility and fecundity in the MR compared to the AR strain.

This research demonstrates that CBW can develop resistance to Cry1Ac insecticidal proteins quicker (three times faster) when selected using activated toxin (more representative of Bt cotton) compared to MVP II. Resistance development in the MR strain was slower and did not increase beyond 16-fold even after selecting for three more generations at higher concentrations. The fitness of this strain was adversely affected in terms of both fecundity and fertility. We believe that the 80.9 percent inert ingredients in the MVP II formulation might have an effect with the fitness of this strain, especially when selecting at 1 mg/g of Cry1Ac concentration. Therefore, our results suggest that using Cry1Ac toxin instead of MVPII is a more appropriate and realistic option for developing a table and highly resistant CBW colony.

Developing Treatment Thresholds for Stink Bugs in Cotton

R. H. Smith

Cotton grown in Alabama is commonly infested by a complex of sucking bugs *(Hemiptera)* that feed on many parts, especially developing bolls. This bug complex consists of several species of plant bugs and stink bugs. Stink bugs prefer to feed on bolls during early stages of boll development causing boll abortion, internal boll rot, and hard locked cotton. Treatment thresholds are not well understood and are static, not reflecting the maturity of the cotton. Sampling techniques are poorly defined and time consuming for scouts and consultants.

The objectives of this test were to validate scouting techniques and further develop treatment thresholds for stink bugs in cotton. This test was conducted at the Wiregrass Research and Extension Center, Headland, Alabama. Eight rows of DPL 543BGII/RR cotton were planted through the middle of a peanut field. This test was located near peanuts in order to insure a steady supply of stink bug migration throughout the boll development period. Beginning the third week of bloom, (July 19), weekly surveys were conducted until the youngest bolls were over 25 days old (September 6). Three thresholds were utilized: an untreated, a 20 percent damage level (University threshold), and a stink bug free plot. Treatments were eight rows, 90 feet long and were replicated four times. Counts were made weekly for live stink bugs (drop cloth technique) and stink bug damaged bolls (quarter diameter bolls crushed and examined for internal injury). Stink bug controls were applied based on the pre-established thresholds. Seven applications were made to the stink bug-free treatment while five applications were required in the 20 percent damage threshold plots. Bidrin, at 0.38 pound ai per acre was used on three treatment dates and a combination of Bidrin 0.38 + Karate 0.0325 pound ai. was used on the remaining treatment dates.

The average boll damage across all sample dates in the untreated control, as presented in Figures 1 and 2, was 91 percent. The average number of bugs found was 8.1 per 12 row feet. In the 20 percent threshold treatment, the average damage found was 30 percent, with an average number of bugs being 2.5 per 12 row feet. Plots that were sprayed seven times in an attempt to be stink bug free still had an average of 16 percent boll damage, but only 0.2 of a stink bug per 12 row feet. Based on this test, it appears that utilizing boll damage is a superior survey tool in making stink bug treatment decisions. In many ways this test may have presented a worst-case scenario for stink bugs. However, since stink bugs appear to migrate weekly from peanuts to cotton, it may reflect the real world situation to all cotton field borders adjacent to peanuts. Based on this test, it appears that some level (5 to 15 percent) of stink bug injury to bolls may occur before they can be detected in the field by the drop cloth sampling technique. Furthermore, one might conclude that using a 20 percent threshold is not adequate to prevent economic damage to cotton field borders adjoining peanuts. Utilizing a 10 percent threshold for stink bugs on field borders may be advisable during the boll development season between the third and seventh week of bloom.

Yields from this test (Figure 3) support the fact that stink bugs may cause heavy economic damage to cotton, especially on field borders adjacent to alternate host crops such as peanuts. The untreated check only yielded 263 pounds of lint per acre while the University threshold (20 percent), receiving five applications, yielded 1375 pounds. The stink bug free treatment, receiving seven applications for stink bug control, yielded 1714 pounds of lint. Under the conditions of this test, it would have been most profitable for growers to use the stink bug free threshold. With cotton valued at $0.50 per pound, the stink bug free threshold returned approximately $170 per acre over the 20 percent University threshold. If the cost of each insecticide plus application was valued at $10 each, the stink bug free threshold would have been most profitable to growers.

Figure 1. Wiregrass stink bug threshold test, percent of bolls damaged, Headland, Alabama, 2005.

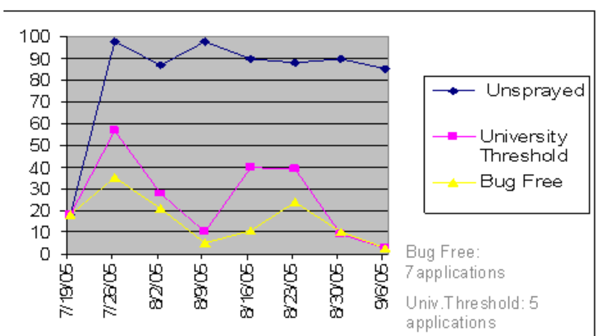


Figure 2. Wiregrass stink bug threshold test, number of stink bugs/12 row feet, Headland, Alabama, 2005

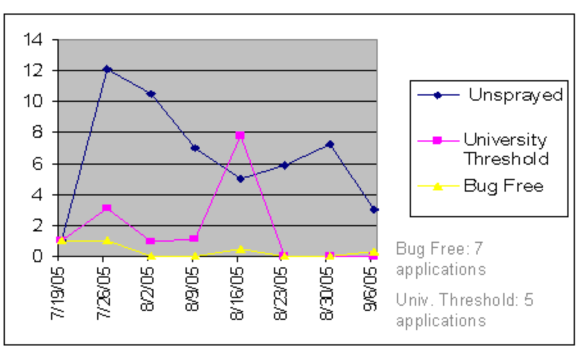
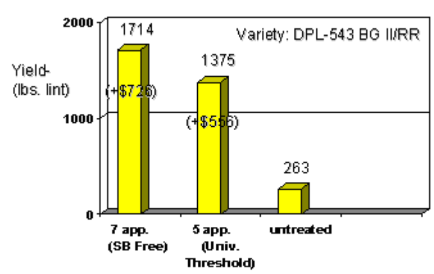


Figure 3. Stink bug threshold test, Headland, Alabama, 2005.



NEMATICIDES

Evaluation of Experimental Seed Treatments for Management of the Reniform Nematode in North Alabama, 2005

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

Gaucho and Temik 15G were compared to two experimental seed treatments for the management of the reniform nematode *(Rotylenchulus reniformis)* in a naturally infested field adjacent to the Auburn University, Tennessee Valley Research and Extension Center, Belle Mina, Alabama. The field had a history of reniform nematode infestation and the soil type was a Decatur silt loam. Gaucho and the experimental seed treatments were applied to the seed by the manufacturer. Temik 15G (5.0 pounds per acre) was applied at planting on April 27 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of two rows, 25 feet long, with a 40-inch 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 production practices as recommended by the Alabama Cooperative Extension System.

Population densities of the reniform nematode were determined at monthly intervals through out the season. Ten soil cores, 1-inch in diameter and 8 inches deep, were collected from the two rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 10. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode and seedling disease pressure was high to moderate in 2005. The Gaucho Exp600003BFS SC seed application increased cotton stand ($P \leq 0.05$) as compared to the Gaucho FS. The skip index indicated cotton stand uniformity was not affected by any treatment as compared to the control. Reniform nematode numbers increased slowly throughout the season with the highest numbers observed in August at 120 days after planting (DAP), which corresponds with the maximum plant growth stage. At 60 DAP the Gaucho experimentals L1489A FS EC at both rates and 600003BFS SC at the low rate reduced reniform numbers as compared to the control. No treatment reduced nematode numbers consistently at all sample dates. Seed cotton yields varied by 688 pounds per acre; however, differences were not significant ($P \leq 0.05$). The Gaucho L1489A FS EC and 600003BFS SC experimentals increased seed cotton yields by an average of 191 and 430 pounds per acre, respectively, as compared to the untreated control.

Table 1. Effect of Experimental Seed Treatments on Cotton Stand, Skip Index, and Yield in North Alabama

Treatment	Rate	Applied	Stand 25 ft row	Skip index[1]	Seed cotton *lb/ac*
Untreated			44.6 ab	7.4 abc	2504
Gaucho FS[3]	500g/100 kg	seed	33.8 b	10.8 ab	3192
Gaucho L1489A FS EC	500 + 100g/100 kg	seed	42.0 ab	5.6 c	2753
Gaucho L1489A FS EC	500 + 0.15 mg/seed	seed	48.4 ab	5.8 c	2446
Gaucho Exp600003BFS SC	500 + 500g/100 kg	seed	40.4 ab	11.0 a	2701
Gaucho Exp600003BFS SC	500 + 750g/100 kg	seed	51.8 a	8.8 abc	3166
Temik 15G[3]	840 g/ha	in furrow	42.2 ab	6.4 bc	2815
LSD P≤0.05			**15.2**	**4.6**	**785**

[1] Plant skip index was based on the number of 12 inch spaces between cotton seedlings in 25 feet of row.
Means within columns followed by different letters are significantly different according to Fisher's LSD (P ≤

Table 2. Effect of Experimental Seed Treatments on Reniform Populations in North Alabama

			R. reniformis per 150 cc soil				
Treatment	Rate	Applied	30 DAP[1]	60 DAP	90 DAP	120 DAP	150 DAP
Untreated			1622.3 ab	1133.0 a	3924	5747 ab	556.2
Gaucho FS[3]	500g/100 kg	seed	1854.0 ab	942.5 ab	4913	5480 ab	927.0
Gaucho L1489A FS EC	500 + 100g/100 kg	seed	957.9 ab	463.5b c	4388	6798 a	1112.4
Gaucho L1489A FS EC	500 + 0.15 mg/seed	seed	1993.1 a	602.6 bc	5552	2364 b	849.8
Gaucho Exp600003BFS SC	500 + 500g/100 kg	seed	1406.0 ab	370.8 c	3554	4388 ab	880.7
Gaucho Exp600003BFS SC	500 + 750g/100 kg	seed	618.0 b	633.5 abc	3847	3662 ab	849.8
Temik 15G[3]	840 g/ha	in furrow	803.4 ab	324.5 c	1715	7298 a	757.1
LSD P≤0.05			**1294**	**507**	**3976**	**3681**	**583**

[1] DAP = days after planting.
Means within columns followed by different letters are significantly different according to Fisher's LSD (P ≤ 0.05).

Evaluation of Experimental Seed Treatments for Management of the Reniform Nematode in South Alabama, 2005

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

Gaucho and Temik 15G were compared to two experimental seed treatments for the management of the reniform nematode *(Rotylenchulus reniformis)* in a naturally infested producer's field near Huxford, Alabama. The field had a history of reniform nematode infestation and the soil type was a loam. Seed treatments were applied to the seed by the manufacturer. Temik 15G (5.0 pounds per acre) was applied at planting on May 10 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of two rows, 25 feet long, with a 36 inch wide row spacing and were arranged in a randomized complete block design with six replications. Blocks were separated by a 15-foot alley. All plots were maintained throughout the season with standard production practices as recommended by the Alabama Cooperative Extension System.

Population densities of the reniform nematode were determined at monthly intervals through out the season. Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the two rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 17. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode pressure was high to moderate in 2005. Cotton stand was not affected by any of the seed treatments or Temik 15G. The skip index indicated cotton stand uniformity was also unaffected by any treatment as compared to the control. Reniform nematode numbers increased slowly throughout the season with the highest numbers observed in August at 90 days after planting (DAP), which corresponds with the maximum plant growth stage. At 60 DAP, the Gaucho experimental 600003BFS SC at the low rate reduced reniform numbers as compared to the control. No treatment reduced nematode numbers consistently at all sample dates as compared to the control. Seed cotton yields varied by 437 pounds per acre; however, differences were not significant ($P \leq 0.05$). The Gaucho L1489A FS EC and 600003BFS SC experimentals averaged over both rates increased seed cotton yields by 225 and 390 pounds per acre, respectively, as compared to the untreated control.

Table 1. Effect of Experimental Seed Treatments on Cotton Stand, Skip Index, and Yield in South Alabama

Treatment	Rate	Applied	Stand 25 ft. row	Skip index[1]	Seed cotton *lb/ac*
Untreated			86.67 a	2.5 a	1741
Gaucho FS[3]	500g/100 kg	seed	70.83 a	2.7 a	2118
Gaucho L1489A FS EC	500 + 100g/100 kg	seed	54.50 a	4.8 a	1934
Gaucho L1489A FS EC	500 + 0.15 mg/seed	seed	58.67 a	4.8 a	1998
Gaucho Exp600003BFS SC	500 + 500g/100 kg	seed	71.17 a	4.0 a	2084
Gaucho Exp600003BFS SC	500 + 750g/100 kg	seed	68.33 a	2.7 a	2179
Temik 15G	840 g/ha (5.0 lb/ac)	in furrow	56 a	6.0 a	1826
LSD P≤0.05			**32.8**	**3.6**	**301**

[1] Plant skip index was based on the number of 12 inch spaces between cotton seedlings in 25 feet of row.
Means within columns followed by different letters are significantly different according to Fisher's LSD (P ≤

Table 2. Effect of Experimental Seed Treatments on Reniform Populations in South Alabama

			R. reniformis per 150 cc soil			
Treatment	Rate	Applied	30 DAP[1]	60 DAP	90 DAP	120 DAP
Untreated			1287.5 a	1377.6 a	1699.5 cd	630.9 ab
Gaucho FS[3]	500g/100 kg	seed	1094.4 ab	1467.8 a	2655.3 abc	424.9 b
Gaucho L1489A FS EC	500 + 100g/100 kg	seed	879.8 ab	1158.8 a	2008.5 bcd	609.4 ab
Gaucho L1489A FS EC	500 + 0.15 mg/seed	seed	965.6 ab	888.4 a	3321.8 abc	875.5 a
Gaucho Exp600003BFS SC	500 + 500g/100 kg	seed	708.1 b	1905.5 a	1236.0 d	399.1 b
Gaucho Exp600003BFS SC	500 + 750g/100 kg	seed	785.4 ab	1570.8 a	3605.0 abc	424.9 b
Temik 15G	840 g/ha (5.0 lb/ac)	in furrow	785.4 ab	1274.6 a	2111.5 bcd	643.8 ab
LSD P≤0.05			**553**	**1264**	**688**	**393**

[1] DAP = days after planting.
Means within columns followed by different letters are significantly different according to Fisher's LSD (P ≤ 0.05).

Evaluation of Avicta, Vydate CLV, and Temik 15G Combinations for Reniform Nematode Management in Cotton in South Alabama, 2005

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

Avicta, Vydate CLV, and Temik 15G were evaluated for the management of the reniform nematode *(Rotylenchulus reniformis)* in a naturally infested field producer's field near Huxford, Alabama. The field had a history of reniform nematode infestation and the soil type was a loam. Avicta was applied to the seed by the manufacturer. Temik 15G (5.0 pounds per acre) was applied at planting on May 10 in the seed furrow and as a side dress application at pinhead square with chemical granular applicators. Vydate C-LV was applied as a foliar spray at the four to sixth true leaf plant growth stage with a two-row CO_2 charged back pack sprayer. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of four rows, 25 feet long, with a 36-inch wide row spacing and were arranged in a randomized complete block design with six replications. Blocks were separated by a 15-foot alley. All plots were maintained throughout the season with standard production practices as recommended by the Alabama Cooperative Extension System.

Population densities of the reniform nematode were determined at monthly intervals through out the season. Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the two rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 17. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode and seedling disease pressure was moderate in 2005; however, hurricane winds reduced the cotton yields. Reniform nematode numbers increased throughout the season from the initial 580 vermiform per 150 cc of soil. At 30 and 60 days after planting (DAP) no differences in nematode numbers were observed between the nematicide treatments and the Dynasty CST 125 + Cruiser 5 FS control. By 90 DAP the combination of Dynasty CST 125 + Crusiser 5 FS + Avicta B + Temik 15 G and the Dynasty CST 125 FS + Temik 15G + Temik 15 G sidedress application both had lower nematode counts ($P \leq 0.05$) than the Dynasty CST 125 + Cruiser 5 FS + Avicta B and the Dynasty CST 125 FS + Temik 15G treatments. The total reniform population throughout the season was lower ($P \leq 0.05$) in the Dynasty CST 125 + Cruiser 5 FS + Avicta B + Temik 15 G treatment as compared to the Dynasty CST 125 + Cruiser 5 FS + Avicta B and Dynasty CST 125 FS + Temik 15G treatments. No differences ($P \leq 0.05$) in the amount of seed cotton production was observed between treatments. Wind damage from hurricanes Dennis, Katrina, and Rita damaged plants and removed bolls.

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

			R. reniformis per 150cc soil					
Treatment/Product	Product/a.i. rate	Product/a.i. rate unit	30 DAP[1]	60 DAP	90 DAP	120 DAP	Season total	Seed cotton *lb/ac*
Dynasty CST 125 + Cruiser 5 FS	32 + 0.34	g/100kg seed + mg/seed	940 ab	798	1789.6 ab	657	4751 bc	2512
Dynasty CST 125 + Cruiser 5 FS + Avicta B	32 + 0.34 + 0.15	g/100kg seed + mg/seed + mg/seed	863 ab	1262	2665 a	502	5858 ab	2254
Dynasty CST 125 FS + Temik 15G	32 + 5.6	g/100kg seed + kg/ha	1172 a	1468	2639 a	734	6579 a	2501
Dynasty CST 125 + Cruiser 5 FS + Avicta B + Temik 15 G	32 + 0.34 + 0.15 + 5.6	g/100kg seed + mg/seed + mg/seed + kg/ha	631 ab	1094	1210 b	515	4017 c	2488
Dynasty CST 125 FS + Temik 15G + Temik 15 G	32 + 5.6	g/100kg seed + kg/ha	567 b	1429	1275 b	476	4313 bc	2364
Dynasty CST 125 + Cruiser 5 FS + Avicta B + Vydate	32 + 0.34 + 0.15 + 561	g/100kg seed + mg/seed + mg/seed + gal/ha	888 ab	863	2330 ab	669	5317 abc	2437
Dynasty CST 125 FS + Temik 15G + Vydate	32 + 5.6 + 561	g/100kg seed + kg/ha + gal/ha	914 ab	1068	2086 ab	656	5305 abc	2274
Dynasty CST 125 + Cruiser 5 FS + Vydate	32 + 0.34 + 561	g/100kg seed + mg/seed + gal/ha	760 ab	1545	1506 ab	576	4957 abc	2538
LSD P≤0.05			**597**	**909**	**1233**	**333**	**1817**	**343**

[1] DAP = days after planting.

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

Evaluation of Avicta Formulations as Compared to Temik 15G for Reniform Nematode Management in Cotton in North Alabama, 2005

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

Avicta formulations A, B, C, and D were compared to Temik 15G for the management of the reniform nematode *(Rotylenchulus reniformis)* in a naturally infested field adjacent to the Auburn University, Tennessee Valley Research and Extension Center, Belle Mina, Alabama. The field had a history of reniform nematode infestation and the soil type was a Decatur silt loam. Avicta was applied to the seed by the manufacturer. Temik 15G (5.0 pounds per acre) was applied at planting on April 29 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of two rows, 25 feet long, with a 40 inch 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 monthly intervals through out the season. Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the two rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 5. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode and seedling disease pressure was high to moderate in 2005. The stand ranged from 32 to 47 percent of the number of seed planted with no differences between treatments at 28 days after planting (DAP). The skip index indicating uniformity in the seedling spacing was similar between all of the treatments. The plant vigor ratings were greater ($P \leq 0.05$) for the seed treatment combinations of Dynasty CST 125 + Cruiser 5 FS + Avicta formulations B, C, and D as compared to Dynasty CST 125 + Cruiser 5 FS treatment with or without Temik 15 G. Reniform nematode numbers increased throughout the season. At 30 DAP reniform numbers were low with no differences between treatments; however, by 60 DAP all nematicide treatments reduced reniform numbers as compared to the Dynasty CST 125 + Cruiser 5 FS treatment. Reniform numbers increased through harvest with no consistent differences between treatments. The total of the monthly reniform populations across the season were not different between treatments. No differences in seed cotton yields were observed between the seed treatments, Temik 15 G, and the non-treated control.

Table 1. Effect of Avicta formulations on Cotton Stand, Skip Index, and Yield

Treatment	Rate	Stand 25 ft row[1]	Skip index[2]	Plant vigor[3]	Seed cotton *lb/ac*
Dynasty CST125 FS + Cruiser 5FS	32.0 + 0.34 g/100 kg seed	43	11.4	2.9 bc	3352
Dynasty CST125 FS + Cruiser 5FS + Avicta 500FS	32 + 21 + g/100kg seed + 0.15 mg/seed	45	9.8	3.2 abc	3023
Dynasty CST125 FS + Cruiser 5FS + Avicta A500FS	32 + 21 + g/100kg seed + 0.15 mg/seed	32	11.8	3.4 ab	3195
Dynasty CST125 FS + Cruiser 5FS + Avicta B500FS	32 + 21 + g/100kg seed + 0.15 mg/seed	43	10.2	3.6 a	3336
Dynasty CST125 FS + Cruiser 5FS + Avicta C500FS	32 + 21 + g/100kg seed + 0.15 mg/seed	36	12.4	3.5 a	2823
Dynasty CST125 FS + Cruiser 5FS + Avicta D500FS	32 + 21 + g/100kg seed + 0.15 mg/seed	47	7.4	3.5 a	3377
AllegianceFL + RTUBaytan-Thiram 1.76FS + Temik15G	315 + 41 g/100kg seed + 5.0 lb/ac	37	11.8	2.77 c	2828
Dynasty CST1.04 FS + Temik 15 G	32.0 g/100 kg seed + 7.0 lb/ac	37	10.4	2.8 c	3165
LSD ($P \leq 0.05$)		**16.2**	**6.1**	**0.56**	**744**

[1] Plant stand was based on number of seedlings per 25 feet of row.
[2] Plant skip index was based on the number of 12 inch spaces between cotton seedlings in 25 feet of row.
[3] Plant vigor was based on a visual assessment of plant development on a 1 to 5 scale, with 5 representing the largest plants and 1 the smallest. Ratings were based on five plants per plot.
Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

TABLE 2. EFFECT OF AVICTA FORMULATIONS ON RENIFORM POPULATIONS

		R. reniformis per 150 cc soil					
Treatment	Rate	30 DAP[1]	60 DAP	90 DAP	120 DAP	150 DAP	Season total
Dynasty CST125 FS + Cruiser 5FS	32.0 + 0.34 g/100 kg seed	880	2795 a	2539 a	1761	1777 c	13339
Dynasty CST125 FS + Cruiser 5FS + Avicta 500FS	32 + 21 + g/100kg seed + 0.15 mg/seed	1545	2533 b	2194 ab	2626	1900 bc	14415
Dynasty CST125 FS + Cruiser 5FS + Avicta A500FS	32 + 21 + g/100kg seed + 0.15 mg/seed	803	1390 bc	1004 c	2796	2905 abc	12505
Dynasty CST125 FS + Cruiser 5FS + Avicta B500FS	32 + 21 + g/100kg seed + 0.15 mg/seed	726	664 c	1746 abc	1761	2735 abc	11248
Dynasty CST125 FS + Cruiser 5FS + Avicta C500FS	32 + 21 + g/100kg seed + 0.15 mg/seed	1251	1035 c	1266 bc	1838	2673 abc	11680
Dynasty CST125 FS + Cruiser 5FS + Avicta D500FS	32 + 21 + g/100kg seed + 0.15 mg/seed	587	1328 c	1792 abc	1637	3878 ab	12839
AllegianceFL + RTUBaytan-Thiram 1.76FS + Temik15G	315 + 41 g/100kg seed + 7.0 lb/ac	1560	1035 c	1916 abc	2101	4172 a	14399
Dynasty CST1.04 FS + Temik 15 G	32.0 g/100 kg seed + 7.0 lb/ac	1375	1684 bc	1468 abc	1838	3739 abc	13720
LSD ($P \leq 0.05$)		**1399**	**1167**	**1147**	**1425**	**2084**	**4120**

[1] DAP = days after planting.
Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

EVALUATION OF AVICTA FORMULATIONS FOR SEEDLING DISEASE AND RENIFORM NEMATODE MANAGEMENT IN COTTON IN NORTH ALABAMA, 2005

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

Avicta variants A, B, C, and D were evaluated for the management of seedling disease and reniform nematodes in a naturally infested field adjacent to the Auburn University, Tennessee Valley Research and Extension Center, Belle Mina, Alabama. The field had a history of reniform nematode infestation and the soil type was a Decatur silt loam. Avicta was applied to the seed by the manufacturer. Temik 15G (5.0 pounds per acre) was applied at planting on April 29 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of two rows, 25 feet long, with a 40-inch 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 monthly intervals through out the season. Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the two rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 5. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode and seedling disease pressure was high to moderate in 2005. Cotton seedling stand was increased ($P \leq 0.05$) by four fungicide treatments as compared to the Cruiser control. Variants B, C, and D performed similarly to the RTU Baytan-Thiram Allegiance FL + Temik 15G standard. The skip index was similar between all of the treatments indicating a standard uniformity in the seedling spacing. Plant vigor was greater ($P \leq 0.05$) for the seed treatment combinations of Dynasty CST 125 + Cruiser 5 FS + Avicta 4.17 and Variant B as compared to the Cruiser control. Reniform nematode numbers increased throughout the season. At 30 day after planting (DAP) reniform numbers were low with no differences between treatments; however, by 60 DAP the Dynasty CST125 + Cruiser 5FS + Avicta 4.17 had higher reniform number as compared to all the variant treatments. Reniform numbers increased through harvest with no consistent differences between treatments. The total of the monthly reniform populations across the season was not different between treatments. Seed cotton yields varied by 956.2 pounds per acre, with an average of all nematicides increasing yields by 671 pounds per acre over the Cruiser control. The Avicta treatments combined increased yields by 606 pounds per acre as compared to Cruiser alone. The two Temik 15G treatments were not different ($P \leq 0.05$) from the Avicta seed treatments.

Table 1. Effect of Avicta Variants on Cotton Stand, Skip Index, Plant Vigor, and Yield

Treatment	Rate	Stand 25 ft row[1]	Skip index[2]	Plant vigor[3]	Seed cotton *lb/ac*
Cruiser 5 FS	0.34 mg/seed	29 d	9.8	3.3 b	2460 b
Cruiser 5FS + Dynasty1.04FS + Systhane 40WSP	0.34+ 0.03 mg/seed+ 32 g/100kg seed	45.2 abc	4.2	3.7 ab	3416 a
Cruiser 5FS + Dynasty1.04FS + Avicta 4.17	0.34+ 0.03 +0.15 mg/seed	39.2 bcd	8	4 a	2865 ab
Variant A		32.6 cd	10.4	3.8 ab	3136 a
Variant B		42 abcd	6.4	4 a	3153 a
Variant C		42.6 abcd	8.6	3.8 ab	2925 ab
Variant D		47.8 ab	7.4	3.8 ab	3251 a
RTU Baytan-Thiram 1.76FS Allegiance FL + Curiser 5FS	4315 + 41 g/100kg seed + 0.34 mg/seed	41 bcd	9	3.8 ab	3114 a
Dynasty 1.04 FS + Temik 15G	0.03 mg/seed + 7.0 lb/ac	45 abc	6.2	3.4 ab	3007 ab
RTU Baytan-Thiram 1.76FS Allegiance FL + Temik 15G	4315 + 41 g/100kg seed + 7.0 lb/ac	56.2 a	5.4	3.6 ab	3311 a
LSD ($P \leq 0.05$)		**14.6**	**6.9**	**0.6**	**641**

[1] Plant stand was based on number of seedlings per 25 feet of row.
[2] Plant skip index was based on the number of 12 inch spaces between cotton seedlings in 25 feet of row.
[3] Plant vigor was based on a visual assessment of plant development on a 1 to 5 scale, with 5 representing the largest plants and 1 the smallest. Ratings were based on five plants per plot.
Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

Table 2. Effect of Avicta Variants on Reniform Populations

		R. reniformis per 150 cc soil					
Treatment	Rate	30 DAP[1]	60 DAP	90 DAP	120 DAP	150 DAP	Season total
Cruiser 5 FS	0.34 mg/seed	710.7	540.8 ab	947.6	1406	417.2 b	4022
Cruiser 5FS + Dynasty1.04FS + Systhane 40WSP	0.34 + 0.03 mg/seed+ 32 g/100kg seed	262.7	339.9 b	648.9	1251	1143.3 ab	3646
Cruiser 5FS + Dynasty1.04FS + Avicta 4.17	0.34 + 0.03 + 0.15 mg/seed	566.5	1004.3 a	664.4	2688	1730.4 ab	6654
Variant A		556.2	386.3 b	726.2	2302	695.3 ab	4666
Variant B		200.9	386.3 b	679.8	1452	453.2 b	3172
Variant C		494.4	324.5 b	957.9	1128	757.1 ab	3662
Variant D		278.1	216.3 b	571.7	1885	741.6 ab	3693
RTU Baytan-Thiram 1.76FS Allegiance FL+ Cruiser 5FS	4315 + 41 g/100kg seed + 0.34 mg/seed	803.4	463.5 ab	1158.8	1581	587.1 b	4594
Dynasty 1.04 FS + Temik 15G	0.03 mg/seed + 7.0 lb/ac	540.8	571.7 ab	1205.1	2750	1220.6 ab	6288
RTU Baytan-Thiram 1.76FS Allegiance FL+Temik 15G	4315 + 41 g/100kg seed + 7.0 lb/ac	370.8	278.1 b	973.4	2766	2024 a	6412
LSD ($P \leq 0.05$)		**757**	**581**	**985**	**2300**	**1388**	**3928**

[1] DAP = days after planting.
Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

Evaluation of the Avicta Seed Treatment and Temik 15G for Reniform Nematode Management in North Alabama, 2005

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

Avicta and Temik 15G were evaluated for the management of the reniform nematode *(Rotylenchulus reniformis)* in a naturally infested field adjacent to the Auburn University, Tennessee Valley Research and Extension Center, Belle Mina, Alabama. The field had a history of reniform nematode infestation and the soil type was a Decatur silt loam. Avicta was applied to the seed by the manufacturer. Temik 15G [5.0 pounds (5.6 kg) per acre] was applied at planting on April 27 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of two rows, 25 feet long, with a 40 inch 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 production practices as recommended by the Alabama Cooperative Extension System.

Population densities of the reniform nematode were determined at monthly intervals through out the season. Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the two rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 10. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode and seedling disease pressure was high to moderate in 2005. The Dynasty CST 125 + Cruiser 5 FS + Avicta seed application increased cotton stand ($P \leq 0.05$) as compared to the Allegiance FL + RTU Baytan-Thiram 1.76 FS + Temik 15 G combination treatment, although the uniformity of the stand was not affected by any treatment. Plant vigor ratings were not affected by treatment. Reniform nematode numbers increased slowly throughout the season with the highest numbers observed in August at 120 days after planting (DAP), which corresponds with the maximum plant growth stage. Both nematicides increased seed cotton yields only numerically as compared to the Dynasty CST 125 + Cruiser 5 FS control. The addition of Avicta to the Dynasty CST 125 + Cruiser 5 FS treatment increased seed cotton yields 163 pounds. The addition of Temik 15 G to the Dynasty CST 125 seed treatment increased seed cotton yields by an average of 172.5 pounds as compared to the Dynasty CST 125 + Cruiser 5 FS treatment. The addition of either nematicide, Avicta or Temik 15G, increased seed cotton yields by 140 pounds per acre.

Table 1. Effect of Avicta and Temik 15G on Cotton Stand, Skip Index, Plant Vigor, and Yield in North Alabama

Treatment/Product	Product/a.i. rate	Product/a.i. rate unit	Applic.	Applic. timing	Stand 25 ft row[1]	Skip index[2]	Plant vigor[3]	Seed cotton *lb/ac*
Dynasty CST 125 + Cruiser 5 FS	32 + 0.34	g/100kg seed + mg/seed	seed	plant	36.4 ab	10.4	3.6	3315
Dynasty CST 125 + Cruiser 5 FS + Avicta	32 + 0.34 + 0.15	g/100kg seed + mg/seed + mg/seed	seed	plant	41.0 a	5.6	3.6	3478
Dynasty CST 125 + Temik 15 G	32 + 5.6	g/100kg seed + kg/ha	seed + infurrow	plant	39.4 ab	8.2	3.3	3428
Dynasty CST 125 + Temik 15 G	32 + 7.8	g/100kg seed + kg/ha	seed + infurrow	plant + side dress	39.4 ab	9.4	3.6	3547
Allegiance FL + RTU Baytan-Thiram 1.76 FS + Temik 15 G	15 + 41+ 5.6	g/100kg seed + kg/ha	seed + infurrow	plant + side dress	31.4 b	11.0	3.5	3368
LSD (P≤0.05)					**9.1**	**5.1**	**0.5**	**458**

[1] Plant stand was based on number of seedlings per 25 feet of row. [2] Plant skip index was based on the number of 12 inch spaces between cotton seedlings in 25 feet of row. [3] Plant vigor was based on a visual assessment of plant development on a 1 to 5 scale, with 5 representing the largest plants and 1 the smallest. Ratings were based on five plants per plot. Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

Table 2. Effect of Avicta and Temik 15G on Reniform Populations in North Alabama

			R. reniformis per 150 cc soil					
Treatment/Product	Product/a.i. rate	Product/a.i. rate unit	30 DAP[1]	60 DAP	90 DAP	120 DAP	150 DAP	Season total
Dynasty CST 125 + Cruiser 5 FS	32 + 0.34 mg/seed	g/100kg seed +	2101	757	1586	4295	819	11629
Dynasty CST 125 + Cruiser 5 FS + Avicta	32 + 0.34 + 0.15	g/100kg seed + mg/seed + mg/seed	1035	726	896	3476	1514	9718
Dynasty CST 125 + Temik 15 G	32 + 5.6	g/100kg seed + kg/ha	2518	525	1391	3337	572	10413
Dynasty CST 125 + Temik 15 G	32 + 7.8	g/100kg seed + kg/ha	2086	355	788	3414	881	10511
Allegiance FL + RTU Baytan-Thiram 1.76 FS + Temik 15 G	15 + 41+ 5.6	g/100kg seed + kg/ha	1221	1272	1138	3245	479	8508
LSD (P≤0.05)			**2416**	**793**	**1002**	**2510**	**708**	**3843**

[1] DAP = days after planting.
Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

COMPARISON OF AVICTA AND TEMIK 15G FOR RENIFORM NEMATODE MANAGEMENT IN COTTON IN SOUTH ALABAMA, 2005

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

Avicta and Temik 15G were evaluated for the management of the reniform nematode *(Rotylenchulus reniformis)* in a naturally infested producer's field near Huxford, Alabama. The field had a history of reniform nematode infestation and the soil type was a loam. Avicta was applied to the seed by the manufacturer. Temik 15G [5.0 pounds (5.6 kg) per acre] was applied at planting on May 10 in the seed furrow with chemical granular applicators attached to the planter. Orthene 90S at 0.3 pound per acre was applied to all plots as needed for thrips control. Plots consisted of two rows, 25 feet long, with a 36-inch wide row spacing and were arranged in a randomized complete block design with six replications. Blocks were separated by a 15-foot alley. All plots were maintained throughout the season with standard production practices as recommended by the Alabama Cooperative Extension System.

Population densities of the reniform nematode were determined at monthly intervals through out the season. Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the two rows of each plot in a systematic sampling pattern. Nematodes were extracted using the gravity sieving and sucrose centrifugation technique. Plots were harvested on October 17. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Reniform nematode and seedling disease pressure was moderate in 2005. The Dynasty CST 125 + Cruiser 5 FS seed application with and without Avicta increased cotton stand ($P \leq 0.05$) as compared to the Allegiance FL + RTU Baytan-Thiram 1.76 FS + Temik 15 G combination treatment. The uniformity of the stand was also increased ($P \leq 0.05$) by these treatments. Reniform nematode numbers increased slowly throughout the season with the highest numbers observed in August at 90 days after planting (DAP),which corresponds with the maximum plant growth stage. Neither Avicta nor Temik 15 G consistently reduced nematode numbers across the season. Avicta in combination with Dynasty CST 125 + Cruiser 5 FS produced the greatest yield. The addition of Avicta to the Dynasty CST 125 + Cruiser 5 FS treatment increased seed cotton yields 55 pounds per acre. The addition of Temik 15 G to the Dynasty CST 125 seed treatment or the Allegiance FL + RTU Baytan-Thiram 1.76 FS seed treatment did not increased seed cotton yields as compared to the Dynasty CST 125 + Cruiser 5 FS treatment.

TABLE 1. EFFECT OF AVICTA AND TEMIK 15G ON COTTON STAND, SKIP INDEX, AND YIELD IN SOUTH ALABAMA

Treatment/Product	Product/a.i. rate	Product/a.i. rate unit	Applic.	Applic. timing	Stand 25 ft row[1]	Skip index[2]	Seed cotton *lb/ac*
Dynasty CST 125 + Cruiser 5 FS MgA/Seed	32 + 0.34	g/100kg seed +	seed	plant	65.7 a	2.5 c	1852 ab
Dynasty CST 125 + Cruiser 5 FS + Avicta	32 + 0.34 + 0.15	g/100kg seed + mg/seed + mg/seed	seed	plant	60.3 a	2.5 c	1907 a
Dynasty CST 125 + Temik 15 G	32 + 5.6	g/100kg seed + kg/ha	seed + infurrow	plant	48.8 b	4.7 bc	1740 abc
Dynasty CST 125 + Temik 15 G	32 + 7.8 kg/ha	g/100kg seed + infurrow	seed + side dress	plant +	35.3 c	9.2 a	1514 c
Allegiance FL + RTU Baytan-Thiram 1.76 FS + Temik 15 G	15 + 41+ 5.6	g/100kg seed + kg/ha	seed + infurrow	plant + side dress	41.5 bc	8.7 ab	1658 bc
LSD (P≤0.05)					**8.9**	**4.3**	**234**

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

TABLE 2. EFFECT OF AVICTA AND TEMIK 15G ON RENIFORM POPULATIONS IN SOUTH ALABAMA

Treatment/Product	Product/a.i. rate	Product/a.i. rate unit	*R. reniformis* per 150 cc soil				
			30 DAP[1]	60 DAP	90 DAP	120 DAP	Season total
Dynasty CST 125 + Cruiser 5 FS	32 + 0.34	g/100kg seed + mg/seed	644 ab	970 ab	2575 ab	1352	6120
Dynasty CST 125 + Cruiser 5 FS + Avicta	32 + 0.34 + 0.15	g/100kg seed + mg/seed+ mg/seed	343 b	1288 a	2124 ab	1069	5433
Dynasty CST 125 + Temik 15 G	32 + 5.6	g/100kg seed + kg/ha	386 b	811 b	2910 a	1532	6219
Dynasty CST 125 + Temik 15 G	32 + 7.8	g/100kg seed + kg/ha	592 ab	862 ab	1429 b	734	4197
Allegiance FL + RTU Baytan-Thiram 1.76 FS + Temik 15 G	15 + 41+ 5.6	g/100kg seed + kg/ha	747 a	1017 ab	1622 ab	901	4867
LSD (P≤0.05)			**337**	**470**	**1403**	**1045**	**2075**

[1] DAP = days after planting.
Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.05$).

2005 On-Farm Reniform Nematode Trials in Northern and Central Alabama

C. H. Burmester, K. S. Lawrence, B. F. Freeman, D. Derrick, W. Griffith, M. Hall, L. Kuykendall, and H. Potter

A total of nine on-farm tests for reniform nematodes were conducted in northern and central Alabama during 2005. Plots were four to twelve rows wide and at least 1,000 feet long. Three treatments (Temik, Cruiser, and Avicta) were replicated three times across the field. Temik was applied in-furrow at a rate of five pounds per acre to all sites except at the Leavelle site in Tuscaloosa County, which received 7 pounds per acre. The Cruiser and Avicta were both seed treatments. Cotton varieties planted were either Stoneville 5599BR or Deltapine 444BG/RR depending on grower preference. All seed contained the Dynasty seed treatment and the Avicta treatment included Cruiser. Soil samples for Temik (adicarb) degradation evaluation were collected at planting. Early season thrips counts were also made from all plots. Vydate at 17 ounces per acre was over-sprayed on each test during squaring. Nematode levels were monitored through the season and yields were determined by picking the whole plot area and weighing on a boll buggy.

The reniform nematode numbers varied greatly between samplings (Table 1). Nematode variability was so great that in most cases differences in nematode populations due to treatments were not statistically significant. These data demonstrate the difficulty in establishing critical nematode threshold levels for control recommendations. Even preplant soil nematode samples taken in February and March correlated poorly with reniform nematode levels at planting. The Whitehead and Leavelle fields had very high reniform levels preplant (10,000 and 20,000 per pint) but populations dropped to 5,000 per pint at planting. In the Shaw and Thorton fields, pre-plant reniform levels were 5-7,000 per pint but jumped to about 20,000 at planting.

The Hamilton and Whitehead sites had very low yields. Hamilton's low yields were mainly due to extremely dry weather and a month delay in getting a stand. Whitehead's cotton cut-out shortly after Katrina and did not develop a top crop at all. Since ST 5599 is a late maturing variety its yields were more severely effected.

Two other sites that were disappointing were Shaw and Leavelle. The Temik treatment was noticeably weak in the Shaw test. Avicta also did not show any increase in yields compared to Cruiser in the Shaw test. The Shaw site overall had the highest nematode levels through the season and apparently these

Table 1. Reniform Nematode Levels in On-Farm Tests, 2005

	———*R. reniformis* per 500 cc soil———								
Site	Lee	Hargrave	Shaw	Thorton	Hamilton	Jenning	Murphy	Whitehead	Leavelle
Variety	ST5599	ST5599	DP444	ST5599	DP444	DP444	DP444	ST 5599	ST5599
Tillage	no-till	tillage	tillage	no-till	no-till	no-till	tillage	no-till	tillage
County	Law.	Lim.	Lim.	Law.	Law.	Chero.	Lim.	Fayette	Tusca.
Trt				Preplant					
Temik	700	4400	4600	6700	5100	4600	5700	10800	20600
Cruiser	700	4400	4600	6700	5100	4600	5700	10800	20600
Avicta	700	4400	4600	6700	5100	4600	5700	10800	20600
				Planting					
Temik	2380	5850	23740	25800	5760	6110	5680	5760	2750
Cruiser	9370	14790	18060	17630	2920	8400	4640	4900	5250
Avicta	1290	9460	18580	16770	2580	4300	3870	3180	4730
				June					
Temik	455	6690	12520	7800	3540	5350	6090	770	3260
Cruiser	850	7370	13030	5320	3770	4670	11460	710	3690
Avicta	570	8400	11320	8400	5230	6630	18430	2710	5830
				July					
Temik	1080	5920	5830	4290	4370	5310	770	4030	7970
Cruiser	4200	6860	4800	6600	6690	10630	710	2230	4970
Avicta	510	9690	6770	9690	5570	6170	2710	5400	6000
				Harvest					
Temik	740	9060	14600	3370	5000	2510	3090	770	6170
Cruiser	1890	4830	15580	1430	5230	5740	4000	460	5490
Avicta	50	5000	8740	1830	4750	4630	1400	910	5970

Table 2. Average Seed Cotton Yields Across Locations, 2005

				——Average yields (lb/ac in north Alabama nematode trials——						
Trt	Shaw	Murphy	Hargrave	Thorton	Hamilton	Lee	Jenning	Leavelle	Whitehead	Avg.
Temik	1537	2490	2270	2103	1300	2650	2247	1727	1437	1973
Cruiser	1773	2260	1917	1910	1270	2540	2000	1660	1633	1884
Avicta	1803	2473	2083	2010	1360	2850	2267	1683	1563	2010
LSD(.1)	**426**	**318**	**263**	**145**	**171**	**334**	**444**	**128**	**27 2**	

nematodes overwhelmed all treatments. The Leavelle site also showed no increase due to Temik (7 pounds per acre) or the Avicta treatment on the very sandy soil in Tuscaloosa county.

The remaining sites produced higher yields and generally bigger differences between treatments. However, most of these differences were not statistically significant (Table 2). The Murphy and Jenning sites produced a 200-pound seed cotton increase when Temik and Avicta were compared to Cruiser. The Thorton and Hargrave sites showed a slight advantage to Temik compared to the Avicta seed treatment, while the Lee site showed a slight advantage to Avicta seed treatment compared to Temik. Spider mites were an early season problem at the Thorton site and the Cruiser and Avicta cotton plots were more severely affected than the Temik-treated cotton plots. Kelthane was applied for control across the test. The Lee field had the lowest reniform numbers with only a few hot spots in the field. It produced the highest yields even though it had very dry weather in August and September.

Aldicarb degradation analysis was conducted at Auburn University. The results of the aldicarb degradation samples are presented in Figure 1. Half the soil was sterilized and half remained natural. Aldicarb was added to all soils and after ten days the amount of aldicarb and its metabolites remaining were determined. The Hargrave, Lee, Murphy, and Thorton sites had no detectable aldicarb remaining after ten days with the natural soil (Figure 1). All sterilized soils contained aldicarb. These data do not seem to correspond well with yields since the Shaw site performed so poorly with Temik. An earlier soil sample indicated aldicarb degradation at the Shaw site so soil microbial variability may be one of the problems. The Hargrave, Lee, and Murphy sites indicated no thrips control problems with Temik (Table 3). The thrips counts did confirm possible Temik problems at the Shaw site, with much higher larva thrips counts averaged during the three, four, and five week samplings after planting.

Figure 1. Aldicarb degradation across on-farm tests, after 10 days.

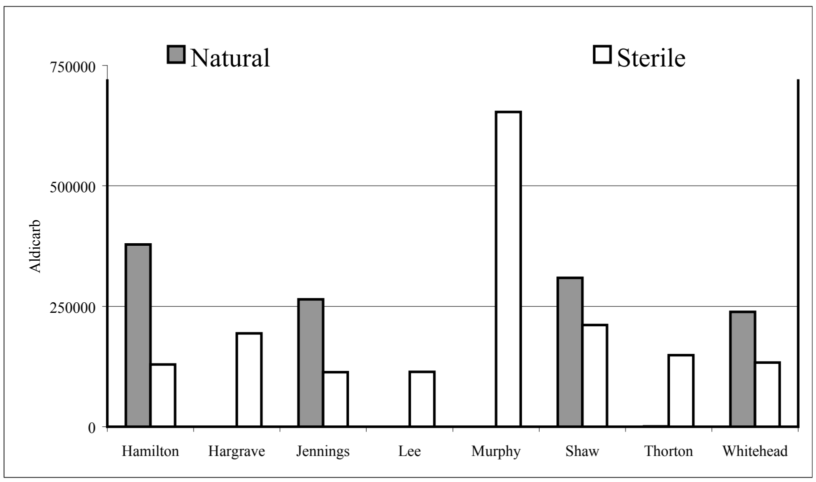


Table 3. Average Larval Thrips per Five Plants from Counts Taken Three, Four, and Five Weeks after Planting

Farmer	Temik	Cruiser	Avicta
Jennings	1.67	9.78	7.56
Hargrave	0.89	0.78	0.33
Hamilton	1.11	1.00	1.78
Murphy	0.44	14.89	10.89
Lee	1.67	1.56	0.89
Whitehead	2.11	3.44	4.11
Thorton	4.89	12.00	6.44
Shaw	13.00	9.22	3.22
Average	3.22	6.58	4.40

EFFECT OF GAUCHO GRANDE COTTON SEED TREATMENT ON RENIFORM NEMATODE CONTROL

W. S. Gazaway and J. R. Akridge

Temik has historically been the most popular nematicide used by Alabama cotton producers to manage reniform nematodes. Each year new prospective pesticides are evaluated to determine if any have nematicide activity. The object of this test is to determine if Gaucho Grande has any effect on reniform nematodes in cotton.

A field belonging to Larry Ward near Huxford, Alabama, was selected for the test. The field, a sandy loam (56 percent sand, 29 percent silt, and 15 percent clay), was infested with high reniform nematode populations. Cotton yields have been reduced substantially as a result of this nematode. Gaucho Grande seed treatment was evaluated for its ability to manage reniform nematodes in cotton. Temik 15G, the standard recommended nematicide treatment, was used as a positive check. Plots were 25 feet long and four rows wide. Row spacing was 36 inches. Treatments were arranged in a randomized complete block design and replicated six times.

Cotton seeds, DPL-555BG/RR variety, were planted on raised seed beds on May 11, 2005. In-furrow treatments of Temik were applied at planting to designated plots. Gaucho Grande-treated seeds were planted the same day (Table 1). Post-plant Temik applications were side dressed in a furrow 6 inches to the side of cotton plants on July 22, 2005. A composite soil sample was taken for a nematode analysis just prior to planting and nematicide treatment on that same day. Soil samples for a nematode analysis were also taken from the two center rows of each plot on June 6 and August 12, 2005. Cotton was harvested from the two center rows of each plot on October 14, 2005.

All cultural practices, weed control, and insect control was according to Auburn University recommendations.

There were no statistical differences in nematode populations among treatments. However, treatments containing Temik 15G had lower reniform nematode populations than Gaucho Grande (Table 2). Likewise, there were no differences in cotton yields between treatments. Good to excellent yields in all treatments in this test indicate that the high reniform nematode populations did little damage to cotton this season. Frequent rains throughout the 2005 growing season provided excellent growing conditions for cotton. Under such conditions, reniform nematodes, which are stress pathogens, do not affect cotton yields significantly.

TABLE 1. TREATMENTS FOR RENIFORM NEMATODE MANAGEMENT IN COTTON

	Pestcide	Rate	Application
1	Gaucho Grande	0.375 mg/ac/seed	Seed treatment
2	Temik 15G	5 lb/ac	In furrow at planting
3	Gaucho Grande +	0.375 mg/ac/seed +	Seed treatment
	Temik 15G	5 lb/ac	In furrow at planting
4	Gaucho Grande +	0.375 mg/ac/seed +	Seed treatment
	Temik 15G	5 lb/ac	Side dress at pinhead square
5	Temik 15G +	5 lb/ac +	In furrow at planting
	Temik 15G	5 lb/ac	Side dress at pinhead square

TABLE 2. EFFECT OF TREATMENTS ON RENIFORM NEMATODE POPULATIONS AND COTTON YIELD

		———Reniform/100 cc soil———			Seed cotton
	Treatment[1]	May 11[2]	June 9	Aug 12	*lb/ac*
1	Gaucho Grande (seed trt)	250	782 a	4007 a	2170
2	Temik 15G (in furrow at plant)	250	995 a	3523 a	2253
3	Gaucho Grande (seed trt) + Temik 15G (in furrow at plant)	250	935 a	3350 a	1963
4	Gaucho Grande (seed trt) + Temik 15G (in furrow at plant)	250	946 a	3242 a	2189
5	Temik 15G + (in furrow at plant) Temik 15G (side dress)	250	918 a	2636 a	2169

[1] trt = seed treatment; in furrow = in the seed furrow; side dress = side dressed post plant at pinhead square.

[2] One composite soil sample for nematode analysis was taken from the entire plot prior to planting.

BAND APPLICATIONS OF TEMIK 15G VERSUS RECOMMENDED TEMIK APPLICATIONS ON RENIORM NEMATODE ON COTTON PRODUCTION IN RENIFORM-INFESTED FIELDS

W. S. Gazaway and J. R. Akridge

Field tests conducted in heavily reniform nematode infested cotton fields in the early 1990s indicated that Temik lightly incorporated in a 6-inch band over the center of the row provided the best cotton yield responses. Temik rates up to 13 pounds per acre were the most effective in these tests. No phytotoxicity of cotton was observed in those tests. Due to safety concerns, the in-furrow application method for Temik was adopted and is currently recommended. The purpose of this test is to revisit the banded application of Temik 15G to determine if the band application method is superior to the current in-furrow application.

A field belonging to Larry Ward near Huxford, Alabama, was selected for the test. This field, a sandy loam (56 percent sand, 29 percent silt, and 15 percent clay), contained high reniform nematode populations and has a history of severe reniform damage to cotton. Three banded rates of Temik 15G were compared to the recommended 5 pounds per acre rate of Temik in-the-furrow and to an in-furrow Temik plus post-plant Temik application (Table 1). Plots were 25 feet long and four rows wide. Row spacing was 36 inches. Treatments were arranged in a randomized complete block design and replicated six times.

Cotton seeds, DPL-555BG/RR variety, were planted on raised seed beds on May 11, 2005. In the furrow treatments of Temik were applied at planting to designated plots. Di-syston 15G (7 pounds per acre) was applied in the seed furrow and used as a check. Banded rates of Temik were applied to designated plots on top of and over the center of the row on a six inch band immediately after the seed had been planted. Temik bands were incorporated into the soil with ½ inch of water using a water wagon. Post-plant Temik applications were side dressed in a furrow 6 inches to the side of cotton plants on July 22, 2005. A composite soil sample was taken for a nematode analysis just prior to planting and nematicide treatment on that same day. Soil samples for a nematode analysis were also taken from the two center rows of each plot on June 6 and August 12, 2005. Cotton was harvested from the two center rows of each plot on October 14, 2005.

All cultural practices, weed control, and insect control was according to Auburn University Recommendations.

No statistical differences in reniform populations or cotton yield could be discerned among treatments (Table 2). However, cotton yields in all Temik treatments produced slightly higher yields than Di-syston 15G treatments. Overall, cotton yields were very good, considering the high infestation of reniform nematodes in the field. Cotton received timely rains and under went very little stress during the 2005 growing season. Under these conditions, reniform nematodes cause relatively little damage to cotton production. Therefore, it is not surprising that Temik had little effect on cotton production in this test in 2005.

TABLE 1. TEMIK 15G APPLICATION METHODS

	Nematicide/ Insecticide	Rate *lb/ac*	Application[1]	Time of application
1	Di-Syston 15G	7	In furrow	At planting
2	Temik 15G	5	In furrow	At planting
3	Temik 15G +	5	In furrow	At planting
	Temik 15G	5	In furrow	Side dress at pinhead square
4	Temik 15G	5	6 inch band	Immediately after planting
5	Temik 15G	10	6 inch band	Immediately after planting
6	Temik 15G	15	6 inch band	Immediately after planting

[1] Banded rates of Temik 15G were applied on a 6-inch band over the center of the row after seed furrow had been closed. Temik was incorporated with ½ inch of water supplied by a water wagon. Side dress applications of Temik were made in an open furrow 6 inches to the side of cotton plants when cotton was at pinhead square.

TABLE 2. EFFECT OF APPLICATION ON RENIFORM NEMATODE POPULATIONS AND COTTON YIELD

		Reniform/100 cc soil			Seed cotton
	Nematicide[1]	May 11[2]	June 9	Aug 12	Oct. 14 (*lb/ac*)
1	Di-Syston	280	697	2578	1946
2	Temik 5 lb (in furrow)	280	360	2677	2067
3	Temik 5 lb (in furrow) + Temik 5 lb (side dress)	280	442	2403	2037
4	Temik 5 lb (band)	280	536	2158	2087
5	Temik 10 lb (band)	280	519	2620	1984
6	Temik 15 lb (band)	280	570	2386	2133

[1] in furrow = nematicide/insecticide applied in the seed furrow at planting; side dress = nematicide/insecticide applied in furrow 6 inches to the side of the cotton plants. Temik applied post-plant at pinhead square; band = Temik applied in a 6-inch band over the center of a raised seed bed and incorporated with ½ inch of water using a water wagon.

FUNGICIDES

Evaluation of Quadris 2.08SC for Management of Cotton Boll Rot Disease in South Alabama, 2005

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

A Quadris 2.08SC fungicide trial was conducted at the Auburn University, Gulf Coast Research and Extension Center, Fairhope, Alabama. The soil type was a Malbis fine sandy loam. Plots consisted of four rows, 25 feet long, with a between-row spacing of 38 inches. Plots were arranged in a randomized complete-block design with five replications. A 20-foot alley separated blocks. Deltapine DP 555 BG/RR, a full season variety, was planted on April 29. All fungicides applications were applied as a foliar spray using a back pack CO_2 system with a two-row boom calibrated to deliver 20 GPA at 25 PSI. Cotton boll rot was evaluated by recording the number of healthy bolls and diseased bolls from a 0.001 acre section within each plot. Disease index (number of diseased bolls / total number of healthy counted) × 100 was calculated for each variety on September 16. Plots were harvested on September 20. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Data were statistically analyzed using PROC GLM, and means were compared with Fisher's protected least significant difference test ($P \leq 0.05$).

Cotton boll rot disease incidence was relatively high in 2005 due to the high rainfall. The disease index taken on September 16 found that all Quadris 2.08SC treatments reduced ($P \leq 0.05$) cotton boll rot compared to the Pix treatment alone. Hard lock incidence was also higher ($P \leq 0.05$) for the Pix treatment alone as compared to the Quadris 2.08SC treatments. Seed cotton yields varied by 451 pounds per acre between Quadris 2.08SC applied at 6.2 or 9.2 fluid ounces per acre and the Pix treatment. Either rate of fungicide reduced cotton boll rot and hard lock and increased yield. The combination of Pix with Quadris 2.08SC numerically reduced yield compared to the Quadris 2.08SC treatments alone but did not affect boll rot.

Effect of Quadris on Cotton Boll Rot, Hard Lock, and Yield

Fungicide	Rate	Timing	Disease index[1] Sept. 16	Hard lock index[2] Sept. 16	Seed cotton *lb/ac* Sept. 20
Quadris 2.08SC	6.2 fl oz/ac	First bloom + 14 days	9.7 b	7.9 b	2707 a
Quadris 2.08SC+ Pix	6.2 + 10 fl oz/ac	First bloom + 14 days	7.7 b	6.3 b	2453 ab
Pix	10 fl oz/ac	First bloom + 14 days	25.1 a	19.4 a	2255 b
Quadris 2.08SC	9.2 fl oz/ac	First bloom + 14 days	11.5 b	9.1 b	2707 a
Quadris 2.08SC+ Pix	9.2 + 10 fl oz/ac	First bloom + 14 days	10.5 b	8.3 b	2552 ab
LSD P≤0.05			**11.5**	**9.7**	**389**

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

EVALUATION OF TOPSIN M FOR MANAGEMENT OF COTTON BOLL ROT DISEASE IN SOUTH ALABAMA, 2005

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

A Topsin M fungicide trial was conducted at the Auburn University, Gulf Coast Research and Extension Center, Fairhope, Alabama. The soil type was a Malbis fine sandy loam. Plots consisted of four rows, 25 feet long, with a between-row spacing of 38 inches. Plots were arranged in a randomized complete-block design with five replications. A 20-foot alley separated blocks. Deltapine DP 555 BG/RR, a full season variety, was planted on April 29. All fungicides applications were applied as a foliar spray with a CO_2 charged back pack system using a two-row, four-nozzle boom calibrated to deliver 10 gallons per acre at 25 psi. Cotton boll rot was evaluated by recording the number of healthy bolls and diseased bolls from a 0.001 acre section within each plot. Disease index (number of diseased bolls / total number of healthy counted) × 100 was calculated for each variety on September 16. Plots were harvested on September 20. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Data were statistically analyzed using PROC GLM, and means were compared with Fisher's protected least significant difference test ($P \leq 0.05$).

Cotton boll rot disease incidence was relatively high in 2005 due to the high rainfall. The disease index taken on September 16 found all Topsin M treatments applied two and four times reduced ($P \leq 0.10$) cotton boll rot compared to the control treatment. Hard lock incidence was also numerically higher for the control treatment as compared to the Topsin M treatments. Seed cotton yields varied by 616 pounds per acre between Topsin M applied four times as compared to the control treatment. The Topsin M treatments applied two, three, and four times biweekly increased yield ($P \leq 0.10$) as compared to the control.

EFFECT OF TOPSIN M ON COTTON BOLL ROT, HARD LOCK, AND YIELD

Fungicide	Rate	Timing	Disease index[1] Sept. 16	Hard lock index[2] Sept. 16	Seed cotton *lb/ac*
Control			18.0 a	11.6	2212 b
Topsin M	16 fl oz/ac	50% bloom + 14 days	10.6 b	6.2	2784 a
Topsin M	16 fl oz/ac	50% bloom + 14 days + 14 days	11.6 ab	7.6	2696 a
Topsin M	16 fl oz/ac	50% bloom + 14 days + 14 days + 14 days	10.2 b	6.8	2828 a
LSD ($P \leq 0.10$)			**6.5**	**5.5**	**397**

[1] Disease index = (number of diseased bolls / total number of healthy bolls) × 100.
[2] Hard lock index = (number of hard lock bolls / total number of healthy bolls) × 100.
Means within columns followed by different letters are significantly different according to Fisher's LSD ($P \leq 0.10$).

Evaluation of Selected Seed Treatment Fungicides for Cotton Seedling Disease Management in Central Alabama, 2005

K. S. Lawrence and B. Durbin

This cotton fungicide test was planted on April 18 at the Auburn University, E. V. Smith Research Center in Shorter, Alabama. The field had a history of cotton seedling disease and the soil type was a sandy loam. Soil temperature was 61°F at a 4-inch depth at 10 a. m. with adequate moisture at planting. Fungicides were applied as a seed treatment or as an in-furrow granular application at planting. Seed treatments were applied to the seed by the manufacturer. In-furrow granular applications were applied with chemical granular applicators attached to the planter. 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 10-foot alley. The nematicide Temik 15G (5 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 on September 21. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test index ($P \leq 0.05$).

Cotton seedling disease incidence was high in 2005 due to cold wet weather. In the high disease incidence plots, differences ($P \leq 0.05$) in seedling stand were observed. At two weeks after planting, Allegiance FL + RTU Baytan-Thiram 1.76 FS combined with TSX 18.8G and three of the experimentals A14911B, C, and D seed treatments increased stand compared to the con-

Effect of Fungicide Seed Treatments on Cotton Stand, Skip Index, and Yield

Treatment	Rate	—Stand 25 ft. row[1]— 14 DAP[1]	28 DAP	Skip index	Seed cotton *lb/ac*
		High disease pressure			
Untreated control		11.5 c	6.75 d	20.2 abc	480 d
Allegiance FL + RTU Baytan-Thiram 1.76 FS	15 + 41 g/100kg/seed	22.2 bc	15.2 bcd	22.7 a	1084 c
Dynasty CST 125 FS + Systane 40 WP	32 + 18 g/100kg/seed	27.0 bc	23.0 a-d	15.5 b-e	1218 bc
Allegiance FL + RTU Baytan-Thiram 1.76 FS + Dynasty CST 125 FS + Systane 40 WP	15 + 41 + 32 + 18g/100kg/seed	23.0 bc	30.2 abc	18.2 a-d	1470 abc
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911A	15 + 41 g/100kg/seed + 0.045	27.0 bc	17.5 bcd	17.7 a-d	1555 abc
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911B	15 + 41 g/100kg/seed + 0.045	35.2 b	20.2 a-d	15.0 cde	1673 ab
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911C	15 + 41 g/100kg/seed + 0.045	37.5 b	33.0 ab	14.2 de	1829 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911D	15 + 41 g/100kg/seed + 0.045	37.2 b	31.7 abc	16.0 b-e	1653 ab
Allegiance FL + RTU Baytan-Thiram 1.76 FS	15 + 41 g/100kg/seed	26.0bc	14.5 cd	20.5 ab	1248 bc
Allegiance FL + RTU Baytan-Thiram 1.76 FS + TSX 18.8G	15 + 41 g/100kg/seed + 5.5 lb/ac	54.7 a	37.2 a	11.7 e	1630 abc
LSD P≤(0.05)		**16**	**18.3**	**5.3**	**484**
		Low disease pressure			
Untreated control		41.2	24.7 c	13.7 a	1395 b
Allegiance FL + RTU Baytan-Thiram 1.76 FS	15 + 41 g/100kg/seed	47.7	34.2 ab	9.5 ab	1970 a
Dynasty CST 125 FS + Systane 40 WP	32 + 18 g/100kg/seed	44.2	29.2 bc	11.7 ab	2022 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS + Dynasty CST 125 FS + Systane 40 WP	15 + 41 + 32 + 18g/100kg/seed	47.0	29.5 bc	9.5 ab	1980 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911A	15 + 41 g/100kg/seed + 0.045	49.0	35.7 ab	9.5 ab	2074 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911B	15 + 41 g/100kg/seed + 0.045	43.7	37.0 ab	9.0 b	1921 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911C	15 + 41 g/100kg/seed + 0.045	50.0	30.0 abc	11.5 ab	2022 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911D	15 + 41 g/100kg/seed + 0.045	50.2	34.7 ab	8.7 b	2048 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS	15 + 41 g/100kg/seed	48.2	35.5 ab	9.0 b	1829 ab
Allegiance FL + RTU Baytan-Thiram 1.76 FS + TSX 18.8G	15 + 41 g/100kg/seed + 5.5 lb/ac	49.2	40.2 a	10.0 ab	2058 a
LSD (P≤ 0.05)		**17.5**	**10.3**	**4.6**	**556**

[1] DAP = days after planting.

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

trol. The Allegiance FL + RTU Baytan-Thiram 1.76 FS + TSX 18.8G and the combination with the experimentals C and D continued to protect the seedling producing a greater stand as compared to the control at four weeks. A lower skip index ($P \leq 0.05$) indicating a more evenly spaced seedling stand was observed in these seed treatments as well. All of the fungicide treatments increased yields over the control ($P \leq 0.05$). Averaging all fungicide treatment yields together produced an increase of 1004 pounds of seed cotton per acre compared to the untreated control. Under low disease pressure, at two weeks after planting, no fungicide treatment increased stands as compared to the control. The Allegiance FL + RTU Baytan-Thiram 1.76 FS alone or in combination with A14911 A, B, and D or TSX 18.8G increased stands compared to the control at four weeks after planting. However, no differences were observed between any treatments as measured by the skip index at four weeks after planting under low disease pressure. Eight of the nine seed treatment fungicides increased yields over the control ($P \leq 0.05$). Yield was increased by 597 pounds of seed cotton per acre as compared to the control under low disease pressure.

EVALUATION OF MYCONATE® FOR COTTON SEEDLING DISEASE MANAGEMENT IN THE TENNESSEE VALLEY REGION OF ALABAMA, 2005

K. S. Lawrence and B. E. Norris

This cotton fungicide test was planted on April 10 at the Auburn University, Tennessee Valley Research and Extension Center, Belle Mina, Alabama. The field had a history of cotton seedling disease and the soil type was a Decatur silty loam. Soil was 68°F at a 4-inch depth at 10 a. m. with adequate moisture at planting. Fungicides were applied as a seed treatment or as an in-furrow granular application at planting. Myconate® seed treatments were applied to the seed by the manufacturer while the Catapult seed treatment was added to the control seed just before planting. In-furrow granular applications were applied with chemical granular applicators attached to the planter. 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 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, four, and six weeks after planting to determine the percent seedling loss and stand density due to cotton seedling disease. Plots were harvested on September 29. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Cotton seedling disease incidence was high in 2005 due to cold, wet weather. In the high disease incidence plots, differences ($P \leq 0.05$) in seedling stand were observed. At two, four, and six weeks after planting, Terraclor Super X increased stand ($P \leq 0.05$) compared to the seed treatments and the control. A lower skip index ($P \leq 0.05$) indicating a more evenly spaced seedling stand was observed in the Terraclor Super X treatment as compared to the Myconate® and control treatments. The Catapult seed treatment increased yield ($P \leq 0.05$) as compared to all other seed treatments under high disease pressure. Under low disease pressure, none of the fungicide treatments increase stands at two, four, and six weeks after planting as compared to the control. However, Terraclor Super X did have a lower skip index, indicating this treatment had an evenly spaced cotton stand as compared to the control. None of the fungicide treatments increased yields over the control ($P \leq 0.05$) under low disease pressure; however, yield was numerically increased by 102 pounds of seed cotton per acre over all as compared to the control under low disease pressure.

FUNGICIDE EFFECTS ON COTTON STAND, SKIP INDEX, AND YIELD

Treatment	Rate	Stand 25 ft. row 14 DAP[2]	Stand 25 ft. row 28 DAP	Stand 25 ft. row 42 DAP	Skip index[1] 42 DAP	Seed cotton *lb/ac*
High disease pressure						
Control		18.2 b	14.2 b	8.2 b	18.8 a	1957 b
Myconate®	0.5 mg/seed	16.4 b	14 b	9.6 b	18.6 ab	1997 b
Myconate®	1.0 mg/seed	17.2 b	13.0 b	9.6 b	19.0 a	1833 b
Catapult	11.75 fl oz/cwt	26.8 ab	22.2 ab	15.4 ab	13.8 bc	2797 a
Terraclor Super X	5.5 lb/ac	32.6 a	30.6 a	22.4 a	12.6 c	2560 ab
LSD (P=0.05)		**14**	**12.3**	**10.7**	**4.8**	**789**
Low disease pressure						
Control		47.8 ab	48.4	47.0 ab	6.0 a	3786
Myconate®	0.5 mg/seed	45.8 b	53	47.0 ab	6.2 a	3853
Myconate®	1.0 mg/seed	44.2 b	46.6	42.2 b	5.4 ab	3934
Catapult	11.75 fl oz/cwt	46.2 ab	49	45.2 ab	4.4 ab	3849
Terraclor Super X	5.5 lb/ac	58.0 a	61.4	57.6 a	2.4 b	3919
LSD (P=0.05)		**12**	**15.9**	**12.6**	**3.1**	**371**

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

[2] DAP = days after planting.

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

Evaluation of Selected Seed Treatment Fungicides for Cotton Seedling Disease Management in the Tennessee Valley Region of Alabama, 2005

K. S. Lawrence and B. E. Norris

This cotton fungicide test was planted on April 10 at the Auburn University, Tennessee Valley Research and Extension Center, Belle Mina, Alabama. The field had a history of cotton seedling disease and the soil type was a Decatur silty loam. Soil was 68°F at a 4-inch depth at 10 a. m. with adequate moisture at planting. Fungicides were applied as a seed treatment or as an in-furrow granular application at planting. Seed treatments were applied to the seed by the manufacturer. In-furrow granular applications were applied with chemical granular applicators attached to the planter. 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 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

Effect of Seed Treatment Fungicides on Cotton Stant, Skip Index, and Yield

Treatment	Rate	Stand 25 ft. row 14 DAP[2]	Stand 25 ft. row 28 DAP	Stand 25 ft. row 42 DAP	Skip index[1] 42 DAP	Seed cotton *lb/ac*
High disease pressure						
Untreated control		11.8 e	6.6 f	4.4 e	22.2 a	1087 c
Allegiance FL + RTU Baytan-Thiram 1.76 FS	15 + 41 g/100kg/seed	24.0 d	22.8 e	15.6 d	18.0 ab	2501 b
Dynasty CST 125 FS + Systane 40 WP	32 + 18 g/100kg/seed	29.8 cd	29.8 cde	29.2 bc	10.2 de	3579 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS + Dynasty CST 125 FS + Systane 40 WP	15 + 41 + 32 + 18g/100kg/seed	30.0 bcd	33.0 b-e	35.0 ab	16.4 bc	3703 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911A	15 + 41 g/100kg/seed + 0.045	40.6 abc	41.4 ab	41.4 a	7.6 e	3804 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911B	15 + 41 g/100kg/seed + 0.045	45.2 a	44.6 a	43.8 a	7.2 e	3757 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911C	15 + 41 g/100kg/seed + 0.045	37.8 abc	38.4 abc	39.0 ab	10.0 de	3773 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911D	15 + 41 g/100kg/seed + 0.045	35.4 a-d	41.4 ab	43.0 a	11.4 cde	3826 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS	15 + 41 g/100kg/seed	41.4 ab	35.2 a-d	29.8 bc	13.0 bcd	3478 a
Allegiance FL + RTU Baytan-T hiram 1.76 FS + TSX 18.8G	15 + 41 g/100kg/seed + 5.5 lb/ac	33.8 a-d	24.2 de	23.2 cd	10.4 de	3458 a
LSD (P≤ 0.05)		**11.4**	**11.5**	**11.1**	**5.1**	**505**
Low disease pressure						
Untreated control		45.2 abc	43.2 b	41.6 c	7.2	3649 c
Allegiance FL + RTU Baytan-Thiram 1.76 FS	15 + 41 g/100kg/seed	54.0 ab	59.0 a	54.6 ab	5.2	4104 ab
Dynasty CST 125 FS + Systane 40 WP	32 + 18 g/100kg/seed	49.0 abc	52.2 ab	51.6 abc	5.2	4182 a
Allegiance FL + RTU Baytan-Thiram 1.76 FS + Dynasty CST 125 FS + Systane 40 WP	15 + 41 + 32 + 18g/100kg/seed	57.8 a	59.6 a	55 ab	3.8	4145 ab
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911A	15 + 41 g/100kg/seed + 0.045	44.4 abc	50.6 ab	53.4 ab	3.8	4006 ab
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911B	15 + 41 g/100kg/seed + 0.045	52.0 ab	50.2 ab	54.8 ab	3.0	4100 ab
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911C	15 + 41 g/100kg/seed + 0.045	41.4 abc	41.0 b	44.6 bc	6.4	3640 c
Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911D	15 + 41 g/100kg/seed + 0.045	53.0 ab	56.2 a	57.2 a	4.4	4158 ab
Allegiance FL + RTU Baytan-Thiram 1.76 FS	15 + 41 g/100kg/seed	38.0 bc	47.4 ab	51 abc	6.8	3813 bc
Allegiance FL + RTU Baytan-Thiram 1.76 FS + TSX 18.8G	15 + 41 g/100kg/seed + 5.5 lb/ac	34.6 c	39.8 b	46.2 bc	5.8	4125 ab
LSD (P≤ 0.05)		**16.4**	**12.9**	**10.9**	**5**	**349.1**

[1] Skip index rating is equal to the footage of row greater than 1 foot not occupied by seedling.
[2] DAP = days after planting.
Means within columns followed by different letters are significantly different according to Fisher's LSD (P ≤ 0.05).

by the Alabama Cooperative Extension System. Stand counts and skip index ratings were recorded at two, four, and six weeks after planting to determine the percent seedling loss and stand density due to cotton seedling disease. Plots were harvested on September 29. Data were statistically analyzed by GLM and means compared using Fisher's protected least significant difference test ($P \leq 0.05$).

Cotton seedling disease incidence was high in 2005 due to cold wet weather. In the high disease incidence plots, differences ($P \leq 0.05$) in seedling stand were observed. At two, four, and six weeks after planting, all fungicide seed treatments increased stand compared to the control. The Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911 A, B, C, and D consistently produced greater stands than the Allegiance FL + RTU Baytan-Thiram 1.76 FS treatment alone. A lower skip index ($P \leq 0.05$), indicating a more evenly spaced seedling stand, was observed in four Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911 A, B, C, and D combinations and TSX treatments as compared to the control at six weeks after planting. Eight of the seed treatment fungicides increased yields over the control ($P \leq 0.05$). Averaging all fungicide treatment yields together produced an increase of 2455 pounds of seed cotton per acre compared to the untreated control. Under low disease pressure, at two weeks after planting, no fungicide treatment increased stands as compared to the control. All four Allegiance FL + RTU Baytan-Thiram 1.76 FS + A14911 A, B, C, and D combinations increased stands compared to the control at six weeks after planting. However, no differences were observed between any treatments as measured by the skip index at six weeks after planting under low disease pressure. Seven of the seed treatment fungicides increased yields over the control ($P \leq 0.05$). Yield was increased by 381 pounds of seed cotton per acre as compared to the control under low disease pressure.

COTTON BREEDING

BREEDING COTTON FOR YIELD AND QUALITY IN ALABAMA

D. B. Weaver

A cotton breeding project was initiated at Auburn University in 2001 to make crosses among several well-adapted cotton cultivars and germplasms. The overall objectives were several: (1) to develop cotton germplasm with improved lint yield and fiber quality traits adapted to Alabama, (2) to study the genetic variability and heritability of various quantitative traits in cotton in early and late generations of inbreeding, and (3) to determine the effects of various inbreeding methods on the variance and heritability of those same traits. Traits of particular interest were lint yield, lint percentage, fiber weight per seed, earliness, and AFIS (Advance Fiber Information Systems) fiber quality traits, particularly those related to length, length uniformity, short fiber content, fiber maturity, and neps.

During 2002, six F2 populations, along with their parents and F1 progeny were grown in the field and more than 1500 individual plants were sampled and fiber analyzed by AFIS. During 2003, approximately 1300 progeny rows were grown from these individual F2 plants (F2:3 lines) (pedigree method), and single plant progenies were also grown 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. In 2004, single-plant progenies were grown from a random sample of the sampled F3 plants (about 2000 F3:4 rows) primarily for the purpose of producing seed for yield-testing of lines in 2005. Two hundred F3:4 lines derived by single-seed decent were also grown for the purpose of comparing the two inbreeding methods.

Based on fiber data from individual F3 plants collected the previous year, a selection index was applied to the pedigree lines based on upper quartile length (UQL) of fibers (inches, by fiber weight), short fiber content (SFC) (count), and lint weight per seed (LWS). From each population the best 50 F4 rows from F3 plants with the highest UQL, lowest SFC, and highest LWS were selected. One hundred ninety-five F4 lines derived from the single-seed descent populations were also harvested without selection. Thus a minimum of 300 lines were derived by pedigree and 195 lines by single-seed decent for future evaluation.

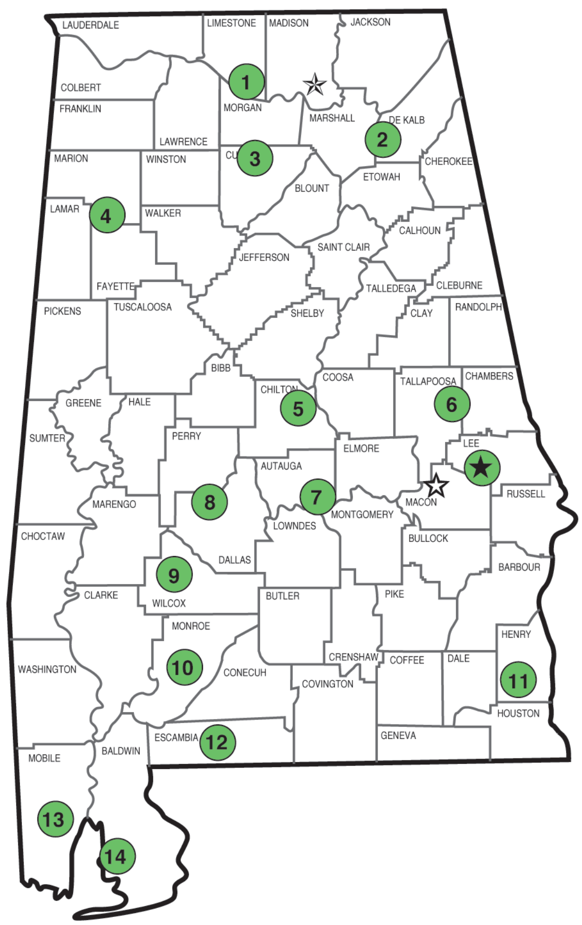
During 2005, at the Plant Breeding Unit at Tallassee, 108 lines derived from pedigree and 92 lines derived by single-seed decent were evaluated, for a total of 200 lines evaluated from the six populations Also evaluated were 48 pedigree-derived lines from one population at Prattville. Each population was evaluated in a different test. Plots were two rows, 20 feet long, with a spacing of 36 inches between rows, replicated three times. Data were collected by sampling 50 bolls from each plot for determining lint percentage, boll size, lint weight per seed, and fiber quality. The entire plot was spindle-harvested to determine seed and lint yield.

The growing season in 2005 was excellent. Yields were high, usually averaging more than 1200 pounds of lint per acre; however results at this stage are very preliminary. Fiber analysis is still being conducted, so fiber quality data are not available. Meaningful yield data will take at least another year to obtain, and these lines will have to be grown for another year before lines can be selected for more intensive evaluation at multiple locations.

Contributors Index

Alabama's Agricultural Experiment Station
AUBURN UNIVERSITY

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



Research Unit Identification

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

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