2000 COTTON RESEARCH REPORT

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Confidential Report

VARIETY TRIALS

CHEROKEE COUNTY COTTON VARIETY TRIAL

Charles Burmester and David Derrick

Cherokee County is a large cotton growing area in northeast Alabama with unique soil types that are not represented in the state cotton variety trials. Each year an Extension cotton variety trial is conducted in the area for farmers to use as a guide in conjunction with results from the Alabama Cotton Variety Tests.

In 2000 the trial 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 cover crop of wheat on May 3 and consisted of eight rows of each variety planted the length of the field.

A total of ten cotton varieties were planted. All varieties were genetically modified and contained the Roundup Ready gene that allows weed control applications with Roundup Ultra until the 4th leaf stage. The cotton variety Paymaster 1218 BG/RR was used as a check variety between each plot to reduce field variability.

Cotton growing conditions were very dry in 2000 but the deep soil still produced good yields (Table 1). Insect numbers were very low and only minimal control measures were required. All varieties were spindled picked, and seed cotton was weighed in a boll buggy. A seed cotton sample from each variety was ginned on a table top gin for lint percentage. Final lint yield results are presented in the table.

CHEROKEE COUNTY COTTON YIELD RESULTS

Variety	Seed cotton yield *lbs/ac*	Lint *%*	Lint *lbs/ac*
Paymaster 1218 BGRR	2620	42	1095
SureGrow 501 Bt/RR	2710	38	1016
SureGrow 521 RR	2480	39	977
Deltapine 420 RR	2540	38	968
Stoneville 4793 RR	2250	41	911
Stoneville 4892 Bt/RR	2300	39	902
Deltapine 458 Bt/RR	2440	37	895
Deltapine 436 RR	2530	35	891
Deltapine 451 Bt/RR	2420	36	878
SureGrow 125 Bt/RR	2360	37	878

VARIETY EVALUATION IN ULTRA NARROW ROW COTTON AT E.V. SMITH

Dennis P. Delaney, Kathy Glass, C. Dale Monks, Bobby Durbin, and James Bannon

Variety selection is one of the most important decisions a cotton producer must make, and little information is available about how different cultivars perform in an Ultra Narrow Row production system. The objective of this test was to compare the suitability of several picker type cotton varieties for use in this type of system.

Twenty selected varieties were planted at the E.V. Smith Field Crops Unit on May 19 with a small plot drill. Approximately 180,000 seed per acre were planted in 7-inch rows in plots 10.5 feet wide by 25 feet long. Weeds were controlled with conventional soil-applied herbicides, and insects were controlled with foliar materials. A total of 100 pounds per acre of nitrogen was applied at planting, with other fertilizers applied according to soil test. A total of 6.35 inches of irrigation was applied during an extremely dry season.

One application of five ounces per acre Pix® was applied at the matchhead square stage. Initial defoliation was on September 14; a second boll opener and defoliant was applied on September 20, and a desiccant on September 26. The center 7 feet by 25 feet of each plot was harvested on September 29 with a broadcast header. Grab samples were ginned on a mini-gin, and lint was analyzed by HVI.

Due to the dry weather, all varieties grew less than 30 inches in height (see table). Lint yields ranged from approximately 850 to nearly 1400 pounds per acre; however, most varieties were not statistically different in yield, except at the extremes. Lint turnout from grab samples ranged from 31 to 40%, and there were several statistical differences in lint quality.

LINT YIELDS AND QUALITY DATA OF ULTRA-NARROW ROW COTTON VARIETIES

Variety	Lint yield *lbs/ac*	Turnout *%*	Height *in*	Mic *units*	Length *in*	Uniformity *%*	Strength *g/tex*
SureGrow 747	1391	37	20	51	1.12	86	27.1
Stoneville ST 4892BR	1379	38	24	50	1.07	84	29.3
Paymaster 1218BG/RR	1375	38	22	51	1.09	86	27.9
SureGrow 501B/R	1363	36	22	47	1.07	85	29.4
SureGrow 125B/R	1301	35	22	43	1.07	84	28.4
Stoneville ST4793R	1298	38	21	48	1.09	87	29.7
Deltapine DP20B	1278	37	18	44	1.08	83	25.7
Deltapine NuCotn 33B	1276	34	20	47	1.14	86	29.8
FiberMax 832	1253	35	23	42	1.12	82	30.5
Phytogen PSC 355	228	37	19	47	1.09	85	29.2
Stoneville ST474	1214	38	21	53	1.07	85	26.2
Paymaster 1560BG/RR	1189	37	21	46	1.08	83	28.3
FiberMax 989	1174	36	20	44	1.15	85	31.1
Deltapine DP458B/RR	1167	35	22	48	1.13	86	30.8
Stoneville BXN47	1153	39	19	48	1.10	88	29.7
FiberMax 819	1148	40	19	45	1.14	86	30.7
SureGrow 105	1112	35	19	48	1.12	86	29.6
Deltapine DP655B/RR	1046	36	19	41	1.06	82	28.9
AgriPro HS44	928	36	16	48	1.08	83	29.7
Phytogen PSC 952	849	31	17	46	1.05	81	27.9
LSD (P=.10)	**268**	**2**	**4**	**5**	**0.05**	**4**	**3.7**

COTTON VARIETY RESPONSE TO THE RENIFORM NEMATODE

Kathy S. McLean, William S. Gazaway, Aaron Palmateer, and J. R. Akridge

Twenty cotton varieties were evaluated for their response to the reniform nematode (*Rotylenchulus reniformis*) in Huxford, Alabama. The test was conduced in a field naturally infested with the reniform nematode and monocultured in cotton. The soil was a silty loam.

Cotton varieties were planted in two-row plots, 25 feet long with a 36-inch row spacing. In one row of the plots, Temik 15G was applied at planting in the seed furrow with chemical granular applicators attached to the planter. In the other row, Di-Syston 8EC was applied as a directed spray in the seed furrow at 10 gallons per acre applied through 8002E flat fan nozzles.

All plots were arranged in a randomized complete block design with six replications. Blocks were separated by a 20-foot alley. Each row was planted with 125 cotton seed. All plots were maintained with standard production practices recommended by the Alabama Extension System commonly used in the area. Plots were not irrigated.

Cotton seedling stand was recorded at 28 days after planting. Population densities of reniform nematode were determined at planting and just before harvest on October 13. Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the two center rows of each plot in a systematic sampling pattern. Nematodes were extracted using gravity sieving and sucrose centrifugation technique. Plots were harvested October 30.

The drought severely affected cotton growth and yield. Reniform nematode populations increased from the initial 3000 per 150 cc of soil to an average of 4,577 and 3,587 per 150 cc of soil for the Temik 15G and Di-Syston treatments, respectively (see table). Temik 15G increased seed cotton yield in half of the varieties compared to Di-Syston. In those ten varieties the final reniform population was lower in the Temik 15G plots compared to the Di-Syston plots. No difference in yield was observed between plots in Delta Pine 458 B/RR, Delta Pearl, SureGrow 747, and Fiber Max 989, indicating possible tolerance to the reniform nematode.

Effect of Reniform Nematode on Yield of Selected Cotton Varieties

Treatment	Reniform count *no./150 cc of soil* Di-Syston	Temik	Seed cotton yield *lbs/ac* Di-Syston	Temik
Stoneville X9905	3493	7184	472	428
Stoneville 6M045	3476	3553	721	891
Stoneville 4892BR	4557	3296	692	893
Stoneville X9903	5948	4171	728	699
Stoneville 4691B	4351	3167	668	779
Stoneville BXN4	6128	2806	627	707
Delta Pine 451 B/RR	4969	4918	820	685
Delta Pine 458 B/RR	5381	2987	687	682
Delta Pine 565	3708	5201	772	641
Delta Pine X9084	3115	2394	651	726
Delta Pearl	2291	5330	900	905
SureGrow 501 B/R	4841	3013	849	731
SureGrow 747	5124	3527	1007	944
Paymaster 1560 BG/RR	4609	2214	540	409
Paymaster 1218 BG/RR	3656	1776	385	303
Stoneville 474	7184	2549	699	581
Phytopen 355	4095	3115	813	985
FiberMax 989	5227	3141	816	828
LSD (0.05)	**3115**	**5201**	**193**	**189**

BIOLOGICAL CONTROLS

THE EFFECTS OF RED IMPORTED FIRE ANTS ON INSECT PESTS AND BENEFICIAL ARTHROPODS IN ALABAMA COTTON

Micky D. Eubanks

Red imported fire ants, *Solenopsis invicta*, are usually considered serious pests. Fire ants are voracious predators and evidence suggests they are important natural enemies of insect pests. Fire ant workers, however, are indiscrete, generalist predators and probably attack beneficial arthropods as well as economic pests. Fire ants could indirectly cause pest outbreaks if their impact is greater on beneficial arthropods than pests.

Surprisingly few studies have attempted to definitively determine the net effect of fire ants on agricultural pests. As a result, it is unclear whether fire ants have a net positive or net negative effect on the biological control of important cotton pests. The goal of this study was to quantify the effects of red imported fire ants on populations of insect pests and beneficial arthropods. The relationship between fire ant and arthropod abundance was estimated from sampling data and greenhouse and field experiments were used to quantify the effect of fire ants on the survival and population sizes of specific pests and beneficials.

Four large cotton fields at E.V. Smith Research Center were sampled throughout the 2000 growing season for fire ants, insect pests, and beneficial arthropods. Three fields were planted with Stoneville BXN47 and one field was planted with Paymaster 1218 BG/RR. Densities of *S. invicta* workers were negatively associated with all 17 species of insect herbivores sampled in cotton, including bollworms, loopers, and tarnished plant bugs. The abundance of fire ants, however, was also negatively correlated with the densities of 22 of 24 natural enemy species collected in cotton.

Fire ants suppressed the densities of some of the most important natural enemies in cotton included ladybird beetles, spiders, green lacewings, and big-eyed bugs. Path analysis of the sampling data suggested that the indirect effects of fire ants on pests was often complex because fire ants not only suppressed populations of beneficial natural enemies (i.e., natural enemies like ladybeetles that primarily consumed pests), but also natural enemies that interfered with biological control (i.e., predators like spiders that seemed to primarily consume beneficials instead of pests). The results of 2000 were very similar to 1999 results.

The results of greenhouse experiments mirrored the field data to a large extent. Red imported fire ants reduced the survival of bollworm caterpillars by 90%, bollworm eggs by 75%, and tarnished plant bugs by 70% on caged cotton plants. These data provide further evidence that fire ants are important predators of important cotton pests and that fire ants attack multiple stages of moth pests. Unfortunately, fire ants reduced ladybird beetle survival by 50% and green lacewing survival by 38% in similar greenhouse experiments. Surprisingly, foraging fire ant workers did not reduce the survival of spiders in greenhouse experiments suggesting that the negative impact of fire ants on spiders in the field may not be due to direct consumption of spiders.

Sampling data and greenhouse experiments strongly suggest that fire ants are the most important predators in cotton and that fire ants have a huge impact on pests and natural enemies. With these data, however, it is difficult to determine the net effect of fire ants on pests. That is, does the suppression of pests by fire ants outweigh the loss of biological control as a result of fire ant predation on other natural enemies? Is overall pest suppression higher with or without fire ants?

To answer these questions, fire ant populations were reduced in cotton fields with fire ant baits and pest populations were compared between fields with high fire ant densities and low densities of other natural enemies and fields with low fire ant densities but high densities of other natural enemies. Baits are excellent tools for this type of experiment because they are composed of an inert, pregelled corn "grit" carrier and soybean oil that is very attractive to foraging fire ant workers but ignored by other insects. A toxicant (either a slow-acting insecticide or an insect growth regulator) is incorporated into the oil so that when foragers find the bait and carry it back to the colony the toxicant is spread throughout the mound and all members of the colony are affected. Broadcast baits, therefore, are specific to ants and do not poison other arthropods.

Fire ants populations were suppressed in four cotton fields at E.V. Smith and four additional fields were untreated and used as controls. Baits were very effective at reducing fire ant populations. Fire ant populations were 72% larger in untreated fields (high fire ant fields) than in treated fields (low fire ant fields).

Caterpillar populations were 41% smaller in high fire ant fields than in low fire ant fields and tarnished plant bug densities were 76% lower in high fire ant fields than in low fire ant fields. This pest reduction was even more impressive given the huge impact fire ants had on other natural enemies. Big-eyed bug populations were 26% smaller in cotton fields with high fire ant densities than in fields with low fire ant densities, hooded beetle populations were 43% smaller, ladybeetle populations were 46% smaller, spider populations were 50% smaller, lacewing populations were 75% smaller, and damsel bugs populations were 82% smaller in cotton fields with high fire ant densities.

These results indicate that even though fire ants decimate populations of other natural enemies, fire ants are still incredibly effective at suppressing pest populations. The net effect of fire ants on biological control in cotton, therefore, is positive.

EVALUATION OF RECHARGE™ (AZOSPIRILLUM) AND PGPR FOR SEEDLING DISEASE CONTROL AND GROWTH PROMOTION OF COTTON

M. S. Reddy, S. P. Nightengale, J. W. Kloepper, and J. Doyle

This experiment was conducted at the Plant Breeding Unit of E. V. Smith Research Station, Tallassee, Alabama. The test was planted on May 25 at a seeding rate of five seeds per foot of row. The field has a history of continuous cropping to cotton. The treatments were mixed with water and applied as an in-furrow spray at planting in an open furrow at 17 fluid ounces per 25 feet of row with a CO_2 backpack sprayer. Rows were manually closed immediately after application of treatments with a Planet Junior™ planter.

Plots consisted of four rows 25 feet long with a between row spacing of 3.2 feet. Plots were arranged in a randomized complete block design with six replications. A 20-foot alley separated blocks. 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 were recorded two and four weeks after planting to determine the percent seedling loss due to cotton seedling disease. Seedling shoot height, stem caliper (stem diameter), and shoot and root fresh weights were measured at four weeks after planting. Plots were harvested on November 6. Data were analyzed using ANOVA and means were compared using Fisher's protected LSD.

Significant differences in stands among treatments were observed two and four weeks after planting. Two weeks after planting, Recharge + PGPR strain S8-G6 and Recharge + PGPR strain IN-26 significantly increased stands compared to the untreated control.

Four weeks after planting, Recharge + PGPR strain 89B61 and Recharge + PGPR strain 90-166 significantly increased stands compared to the control. Four weeks after planting, the treatments containing the four PGPR strains showed significantly increased height and caliper, and strains 90-166, IN-26 and S8-G6 significantly increased root fresh weight compared to the untreated control. There were no significant differences in shoot fresh weight among treatments.

Recharge + PGPR strain 89B61, Recharge + PGPR strain S8-G6, and Recharge + PGPR strain IN-26 significantly increased yields compared to the untreated control.

INFLUENCE OF VARIOUS BIOLOGICAL TREATMENTS ON HEALTHY STAND, GROWTH PROMOTION, AND YIELD OF COTTON

Treatment (rate/ha)	Stand (*plants/25 ft*)		Seedling growth four weeks after planting				Seed cotton yield
	June 9	June 23	Height *(in)*	Caliper[1] *(in)*	SFWT[2] *(g)*	RFWT[3] *(g)*	*(lbs/ac)*
Recharge 159 fl oz	95.8	82.3	9.37	0.11	3.75	0.405	1269
Recharge 159 fl oz + PGPR 89B61 1.7 X 10[7] CFU[4]/ml	91.0	90.4	9.48	0.11	3.88	0.405	1408
Recharge 159 fl oz + PGPR 90-166 1.7 X 10[7] CFU/ml	74.7	91.3	9.53	0.11	3.46	0.483	1408
Recharge 159 fl oz + PGPR S8-G6 1.7 X 10[7] CFU/ml	101.7	78.2	9.69	0.12	3.87	0.444	1743
Recharge 159 fl oz + PGPR IN-26 1.7 X 10[7] CFU/ml	111.5	79.7	10.16	0.12	4.11	0.539	1773
Untreated control	83.7	72.3	8.85	0.10	3.69	0.381	1018
LSD (0.05)	**21.6**	**14.3**	**0.63**	**0.009**	**0.66**	**0.065**	**598**
LSD (0.10)	**17.9**	**11.9**	**0.51**	**0.007**	**0.55**	**0.054**	**497**

[1] Caliper = stem diameter.
[2] SFWT = shoot fresh weight.
[3] RFWT = root fresh weight.
[4] CFU = colony-forming units.

EVALUATION OF ASCEND DC™, RECHARGE™, AND PGPR 89B61 FOR SEEDLING DISEASE CONTROL AND GROWTH PROMOTION OF COTTON

M. S. Reddy, S. P. Nightengale, J. W. Kloepper, and J. Doyle

This experiment was conducted at the Plant Breeding Unit of E. V. Smith Research Station, Tallassee, Alabama. The test was planted on May 24 at a seeding rate of 16 seeds per meter of row. The field had a history of cotton seedling disease and the soil type was a sandy loam. The treatments were mixed with water and applied as an in-furrow spray at planting in an open furrow at 17 fluid ounces per 25 feet of row with a CO_2 backpack sprayer. Rows were manually closed immediately after application of treatments with a Planet Junior™ planter.

Plots consisted of four rows 25 feet long with a between row spacing of 3.2 feet. Plots were arranged in a randomized complete block design with six replications. A 20-foot alley separated blocks. Plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Stand counts were recorded two and four weeks after planting to determine the percent seedling loss due to cotton seedling disease. Seedling shoot height, stem caliper (stem diameter), and shoot and root fresh weights were measured four weeks after planting. Plots were harvested on November 6. Data were analyzed using ANOVA and means were compared using Fisher's protected LSD.

Significant differences in stand among treatments were observed two and four weeks after planting. Two weeks after planting, use of Recharge, Ascend at 350 g/ha and Recharge + Ascend + PGPR resulted in significantly greater stands than the untreated control. Ascend at 84 g/ha was significant. Four weeks after planting, only the Recharge + Ascend + PGPR treatment produced a significantly better stand than the control.

All treatments significantly increased seedling height except Ascend 84g. The PGPR alone or combined with Recharge and Ascend significantly increased caliper compared to the control. There were no significant differences for shoot fresh weight. The high rate of Ascend and the Recharge + Ascend + PGPR significantly increased root fresh compared to the control.

All treatments produced significantly greater yields compared to the control. Yield for the Recharge + Ascend + PGPR treatment was significantly higher than the Recharge, both rates of Ascend, or PGPR alone.

INFLUENCE OF VARIOUS BIOLOGICAL TREATMENTS ON HEALTHY STAND, GROWTH PROMOTION, AND YIELD OF COTTON

Treatment (rate/ha)	Stand *(plants/25 ft)*		Seedling growth four weeks after planting				Seed cotton yield
	June 9	June 23	Height *(in)*	Caliper[1] *(in)*	SFWT[2](g)	RFWT[3](g)	*(lbs/ac)*
Recharge 159 fl oz	104.0	76.0	8.98	0.13	5.14	0.409	3467
Ascend DC 350 g	91.3	86.3	9.72	0.13	5.31	0.464	3552
Ascend DC 84 g	88.7	73.9	9.09	0.12	4.78	0.402	3612
PGPR strain 89B61 1.7 X 10^7 CFU[4]/ml	83.5	85.8	9.29	0.13	5.17	0.422	3654
Recharge 159 fl oz+ Ascend 350 g + PGPR strain 89B61 1.7 X 10^7 CFU/ml	93.2	101.3	9.21	0.13	5.24	0.459	4049
Untreated	75.7	82.0	8.23	0.12	4.76	0.387	3168
LSD (0.05)	**15.6**	**17.2**	**0.66**	**0.007**	**0.76**	**0.065**	**264**
LSD (0.10)	**12.9**	**14.3**	**0.55**	**0.006**	**0.63**	**0.054**	**216**

[1] Caliper = stem diameter.
[2] SFWT = shoot fresh weight.
[3] RFWT = root fresh weight.
[4] CFU = colony-forming units.

CROP PRODUCTION

TILLAGE, COVER CROPPING, AND POULTRY LITTER EFFECTS ON COTTON

K. C. Reddy, E. Z. Nyakatawa, and D. A. Mays

The development of conservation tillage systems capable of reducing soil erosion and improving soil quality while increasing yields and profits remains a challenge for cotton producers in the Southeast. They are hesitant to adopt conservation tillage practices because of the typically inadequate and less vigorous crop stand.

Since 1996, researchers have been evaluating the effects of tillage (conventional till, mulch-till, and no-till), cropping systems (cotton alone or cotton in summer and rye in winter), and nitrogen sources and rates (ammonium nitrate and poultry litter at 0, 90, 180 pounds of nitrogen per acre) on cotton germination and yield at Belle Mina, Alabama. The purpose of this article is to present results from that research.

Cotton seedling counts under no-till were 40 to150% greater than those under conventional till at one and two days during seedling emergence. Cotton in summer and rye in winter cropping system had 14 to 50% greater seedling counts than cotton alone treatment during the first four days of emergence in 1998. Similarly, the poultry litter source of nitrogen increased seedling emergence by 17 to 50% in 1998 compared to the ammonium nitrate source. In all these cases, the differences progressively narrowed by the fourth day of seedling emergence. These seedling counts correlated significantly to cotton lint yield especially in 1998 when the season was much drier and the conservation tillage and poultry litter application treatments were able to conserve more moisture.

Cotton lint yields under no-till were greater by 7 to 24% than that under conventional till and mulch-till systems. Poultry litter source of nitrogen produced similar cotton lint yield as ammonium nitrate (Table 1).

The combination of (1) no-till, (2) cotton-in-summer-and-rye-in-winter cropping system, and (3) surface application of 180 pounds of nitrogen per acre through poultry litter conserved soil moisture in the top 7centimeters of the soil (Table 2). This resulted in early seedling emergence, high seedling vigor, good plant growth, and high lint yields of cotton. These treatments would be appropriate for use in the Southeast where soil erosion is a problem and plenty of poultry litter is available each year from the poultry industry.

TABLE 1. COTTON LINT YIELD AS INFLUENCED BY TILLAGE, CROPPING SYSTEM, AND SOURCE OF NITROGEN

Treatment	Lint yield *(lbs/ac)* 1997	Lint yield *(lbs/ac)* 1998
Conventional vs mulch-till	980 vs 1030 (NS)	1205 vs 1270 (NS)
Conventional vs no-till	980 vs 1215 *	1205 vs 1285 *
Cotton alone vs cotton-rye	1090 vs 1100 (NS)	1210 vs 1270 (NS)
Ammonium nitrate vs poultry litter	1170 vs 1035 (NS)	1355 vs 1205 (NS)

NS = Treatment differences are non-significant; * = Treatment differences are significant.

TABLE 2. VOLUMETRIC SOIL WATER CONTENT (M^3 M^{-3}) IN THE TOP 7 CM OF THE SOIL IN COTTON PLOTS

Days of seedling emergence: 1		2		3		4	
CT[1]	NT	CT	NT	CT	NT	CT	NT
1997							
0.21	0.275*	0.185	0.245*	0.175	0.205*	0.165	0.205*
1998							
0.215	0.255*	0.165	0.205*	0.13	0.175*	0.11	0.155*

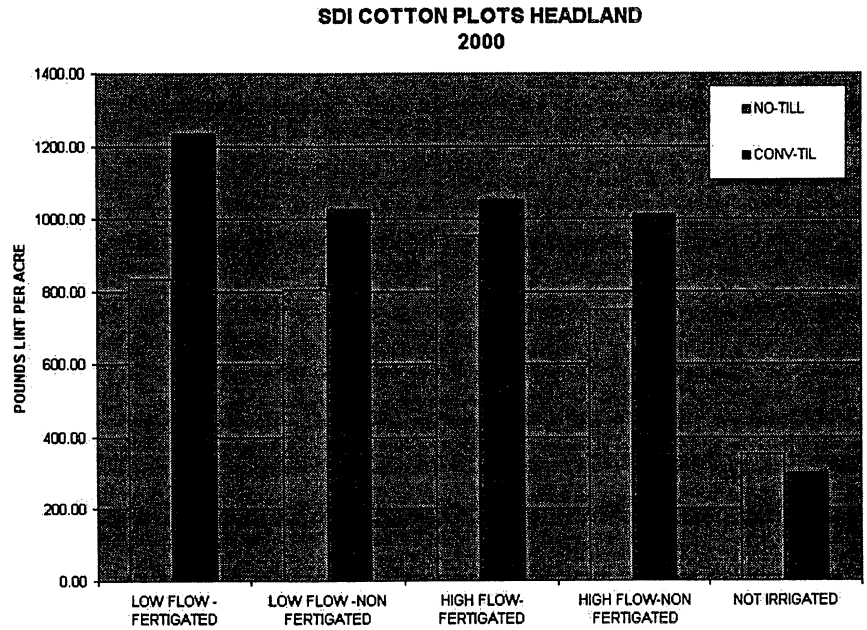
*= Treatment differences are significant
[1] CT = conventional till; NT = no till.

EVALUATION OF SUBSURFACE DRIP IRRIGATION IN THE WIREGRASS

Larry M. Curtis, William C. Birdsong, and Jim Baier

Subsurface drip irrigation was evaluated for the second year at the Wiregrass Regional Research and Extension Center. The center received record low rainfall during the 2000 growing season, resulting in tremendous difficulties in germination. The research plot area was irrigated with an overhead sprinkler system to initiate germination. No-till plots had less germination, resulting in reduced yields compared to conventional till. Future plans called for evaluating the potential for germination (if needed) using subsurface drip irrigation rather than sprinkler irrigation.

The subsurface drip irrigation tape was installed in 1999 between every other row, 15 inches deep and with emitters located every 2 feet along the tape. Treatments included the following: no-till and conventional till, fertigation through the system and conventional fertilizer, high flow and low flow tape, and nonirrigated plots. The 2000 yield results for these treatments are indicated in the chart below.



EVALUATION OF AN AG LEADER™ COTTON YIELD MONITOR

Charles H. Burmester, Randy Raper, and Eric Schwab

An Ag Leader™ PF 3000 cotton yield monitor was evaluated in normal cotton field situations and in harvesting large research plots at the Tennessee Valley Research and Extension Center at Belle Mina, Alabama, in 2000.

The yield monitor was installed on a John Deere model 9920 two-row cotton picker. This picker has four cotton chutes that deliver cotton to the basket. Cotton flow sensors were installed on all four chutes. Other sensors installed were a fan speed sensor and a header height sensor. Ground speed was determined through a Trimble™ GPS system installed on the picker. The objectives of this study were to determine (1) picker modification and user knowledge needed to operate the Ag Leader cotton yield monitor, (2) accuracy of the Ag Leader monitor in farm cotton field conditions, and (3) feasibility of the Ag Leader monitor in cotton research plot areas.

Installation of the yield monitor was fairly straightforward. The most difficult task was cutting each side of the cotton chutes for installation of the flow sensors. This picker had two curved chutes, which made alignment more difficult. Technical support in installation and trouble shooting problems was excellent.

Early season evaluations were done in large fields located on the Research and Extension Center. Yield predictions by the Ag Leader system were compared to weights measured by dumping into a boll buggy equipped with scales. In most cases, early season yield predictions by the Ag Leader system were 1 to 6% greater than actual weights measured. This variance increased as more baskets were picked. The problem was due to cotton stringers developing over the flow sensors in the curved chute. Very little cotton stringer development was found in the straight chutes. A quick brushing of the sensors in the curved chutes after each

Table 1. Seed Cotton Yield Predictions Using the Ag Leader™ Yield Monitor in a Large Field

Actual weight *lbs*	Monitor prediction *lbs*	Variation %
1915	1930	+0.8
1786	1854	+3.8
1651	1627	-3.8
2689	2630	-2.2
2680	2846	+6.2
2636	2723	+3.3
2570	2654	+3.2

Table 2. Seed Cotton Yield Prediction Using the Ag Leader™ Yield Monitor in a Small Plot Area

Actual weight *lbs*	Monitor prediction *lbs*	Variation %
1366	1398	+2.3
1324	1333	+0.6
1353	1385	+2.4
1322	1340	+1.4
1398	1409	+0.8
1346	1383	+2.7
1365	1407	+3.1
1367	1371	+0.2
592	586	-1.0
1212	1268	+4.1

dumping eliminated the problem. After this, predicted yields measured by the Ag Leader system became more consistent and were generally within 5% of measured yield (Table 1).

The yield monitor was also evaluated in a drip irrigation test area with plots that measured two rows wide and 340 feet long. Each plot was picked, and the weight of the cotton was measured in a boll buggy. This weight was compared to that predicted by the yield monitor. Measured weights ranged from 77 to 208 pounds per plot. In this test, the Ag Leader system very accurately predicted yields. Measured yield and Ag Leader predicted yields varied only from –1.0 to +4.1 percent (Table 2).

Overall evaluations of the Ag Leader PF 3000 cotton yield monitor were very favorable. With only limited knowledge of the system, we were able to install and operate the system with minimal difficulties. Yield prediction by the Ag Leader system were generally within 5% both in field and large plot situations.

INSECTICIDE APPLICATIONS

EVALUATION OF INSECTICIDES FOR CONTROL OF DETRIMENTAL SPECIES AND SELECTIVITY AGAINST BENEFICIAL SPECIES IN BT COTTON

Ron Smith

Approximately 65% of Alabama's cotton acreage has been planted to Bollgard™ Bt varieties during the past five seasons. This trend is expected to continue. Insects that are occurring most often at damaging levels in Bollgard fields are the plant bug complex, escape bollworms, fall armyworms, and stink bugs.

Beneficial insects may be used to a greater degree in Bollgard cotton where no boll weevils are present. However, when beneficials are maintained further into the season, economic damage from subthresholds of one, or combinations of, damaging insects often occur. Insecticides that can selectively remove damaging insects without suppressing beneficials would be highly desirable.

Tests were conducted in 2000 to determine the efficacy and selectivity of several insecticides on the plant bug complex, stink bugs, and beneficials.

Field trials were held at the Wiregrass Research and Extension Center and Prattville Experiment Field. Cotton was planted using customary production practices and monitored at regular intervals. Tests were initiated when uniform natural threshold populations were detected. Plots were of various sizes, but were generally eight or more rows wide by several hundred feet in length. (Larger plots must used for mobile pests such as plant bugs and stink bugs.) Multiple samples were taken within each treated area by either sweep net or drop cloth. Treatments were made by traditional hiboy application techniques with standard nozzles, volumes, and pressure. Evaluations were made one, three to five, and seven days post treatment.

The first test at Prattville Experiment Field was targeted towards a primarily nymphal population of tarnished plant bugs on June 26. At one day post treatment all chemicals gave some suppression when compared to the untreated check. However, a wide range of control was found between the different treatments. Centric at 0.062 pound active ingredient (a.i.) per acre, Assail at 0.05 pound a.i. per acre, and Lorsban at 0.2 pound a.i. per acre gave the best control after 24 hours. At 10 days post treatment Centric at 0.047 and 0.062 pound a.i. per acre, Orthene at 0.2 pound a.i. per acre, Assail at 0.05 pound a.i. per acre, and Bidrin at 0.2 pound a.i. per acre gave the best plant bug suppression. Lorsban at 0.2 pound a.i. per acre was the most selective. Centric, Orthene, Assail, and Ammo showed little selectivity against the minute pirate bug and lady beetles.

The second test at Prattville Experiment Field was also targeted towards a nymphal plant bug population on July 10. Bidrin at 0.2 pound a.i. per acre, Asana at 0.032 pound a.i. per acre, Centric at 0.047 pound a.i. per acre, Steward at 0.09 pound a.i. per acre, and Assail at 0.05 pound a.i. per acre gave superior plant bug suppression at three days post treatment. Steward, Assail, and Baythroid gave the greatest selectivity towards big eyed bugs while Leverage, Bidrin, and Centric were the least selective. Steward was distinctly the most selective on minute pirate bugs while Centric, Bidrin, and Assail were the least selective. All treatments gave excellent control of the cotton fleahopper species.

The test at the Wiregrass Research and Extension Center was conducted under an extremely heavy nymphal stink bug population (3 x threshold). At 24 hours post treatment Ammo at 0.06 pound a.i. per acre, Bidrin at 0.33 and 0.5 pound a.i. per acre, Baythroid at 0.03 pound a.i. per acre, Decis at 0.02 pound a.i. per acre, Vydate at 0.25 and 0.5 pound a.i. per acre, Centric at 0.047 and 0.62 pound a.i. per acre, Capture at 0.05 pound a.i. per acre, Leverage at 0.038 + 0.026 pound a.i. per acre, and Orthene at 0.8 pound a.i. per acre, all gave good control of the nymphal stage of the southern green stink bug. Steward at 0.11 pound a.i. per acre and Dibrome at 0.94 pound a.i. per acre gave approximately 50% suppression. Due to the maturity of cotton (bolls beginning to open) and late date (September 26) few beneficials were present.

THRIPS CONTROL IN COTTON

Barry L. Freeman

This trial compares Adage, a promising seed treatment, to Temik, a standard in-furrow granular insecticide, for control of thrips on seedling cotton.

Cotton (SG 125RR) was planted on the Tennessee Valley Research and Extension Center in Belle Mina, Alabama, on April 26, 2000. Plots were four rows by 25 feet and were replicated four times. The test area was under irrigation. Although nematodes are not known to be a problem on this test site, a high rate of Temik treatment was added because this rate is commonly used for management of reniform nematodes.

Thrips were sampled by rinsing five random plants per plot in 75% ethyl alcohol, filtering the contents, and counting both adult and larval thrips using a stereoscope. Samples were taken on May 15, May 22, and May 30. A visual rating of thrips injury was also made for each plot on these same dates. Plots were rated from 0-5 with 0 indicating no thrips injury and 5 representing extreme injury.

Plant populations were estimated on June 20 by counting all living plants in the center two rows of each plot.

Cotton yields were determined by mechanically harvesting the center two rows of each plot on September 12.

Thrips populations were very high, averaging more than 30 thrips per plant in some treatments (Table 1). The tobacco thrips, *Frankliniella fusca*, was the predominant species on the first sample date and remained common on the last two sample dates. The flower thrips, *F. tritici*, became common on the second sample date and was the most common species on the last sample date. The Western flower thrips, *F. occidentalis*, was present in fair numbers on the last two sampling dates, but was overshadowed by the two previously mentioned species. An occasional soybean thrips, *Neohydatothrips variabilis*, was observed throughout the test period. No difference in species composition was noted among treatments.

The control plots revealed very high numbers of thrips throughout the test period, and there was a corresponding amount of damage (Table 1 and 2). The Adage treatment averaged around two larval thrips per plant on the first sample date and a little more than 13 larvae per plant on the second date. By the third sample date, the thrips population exceeded that of the control treatment (Table 1). The Adage treatment thrips populations ran somewhat contrary to the damage ratings. There was a moderate increase in damage to the Adage-treated plots over the course of the sample period (Table 2), but in no way did the amount of damage reflect the numbers of thrips sampled. The damage to the Adage plots reflected in Table 2 was primarily crinkled leaves, but overall, the plants were growing vigorously.

The Temik treatments contained the fewest numbers of thrips, and the higher rate had considerably fewer thrips than did the standard Temik treatment (Table 1). Considerable thrips reproduction was revealed on the last two sample dates in the standard Temik treatment (Table 1). Damage ratings of the Temik treatments were low (Table 2).

All treatments lost fewer plants than the control (Table 2). Among the treatments, the highest plant population was found in the Adage treatment, followed by the standard rate of Temik, which was slightly better than the nematicidal rate of Temik (Table 2).

All yields in the treated plots were much better than those of the control treatment, with increases ranging from 36 to 46% (Table 2).

TABLE 1. NUMBERS OF THRIPS PER FIVE PLANTS

	—May 15—		—May 22—		—May 30—		—Seasonal average—		
Treatment	A[1]	L	A	L	A	L	A	L	T
Temik 7 lbs. a.i./ac.	1.50	1.50	15.50	10.75	6.50	9.00	7.83	7.08	14.92
Temik 5 lbs. a.i./ac.	1.75	4.25	21.75	28.25	29.75	112.25	17.75	48.25	66.00
Adage 0.3 lbs./cwt	6.50	9.00	35.00	68.25	50.25	324.25	30.58	133.83	164.42
Control	11.50	107.50	38.00	162.50	34.00	133.00	27.83	134.33	162.17

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

TABLE 2. THRIPS DAMAGE RATINGS, PLANT POPULATION, AND YIELD

	Damage ratings				Plants	Seed cotton
Treatment	May 15	May 22	May 30	Average	*no/row ft*	*lbs/ac*
Temik 7 lbs. a.i./ac.	1.00	1.00	1.00	1.00	2.80	3512
Temik 5 lbs. a.i./ac.	1.00	1.00	1.75	1.25	3.04	3597
Adage 0.3 lbs. a.i./cwt	1.00	2.00	2.75	1.92	3.24	3773
Control	3.25	4.25	4.75	4.08	2.56	2581

THRIPS CONTROL FOR ULTRA NARROW ROW COTTON

Dennis P. Delaney, C. Dale Monks, Bobby Durbin, and Don P. Moore

Ultra Narrow Row (UNR) cotton acreage has become widely adopted in the last few years in Alabama. Many management practices may need to be modified to suit the needs of this system, including early season thrips control.

Growers of wide row cotton often use in-furrow insecticides at planting, but the labeled rates per foot of row would be prohibitively expensive, because of the increased number of rows with UNR. Systemic seed treatment can also be very expensive, due the large number of seed planted, while foliar applications have the potential to kill beneficial insects and increase other pest populations. The objective of this research was to determine the optimum method of controlling early season insects in UNR cotton.

The experimental design was a randomized complete block with four replications with plots 10.5 feet wide by 30 feet long. Deltapine 458 BR seed was planted on April 11 at the E.V. Smith Field Crops Unit and April 17 at Prattville Experiment Field. A cone type plot drill was used to plant 180,000 seed per acre in 7-inch rows. Gaucho was applied to seed as a treatment before counting, while Temik 15G was weighed for the respective rates and placed in envelopes with the seed to drop in-furrow. Orthene was foliar applied as soon as thrips or damage was noted, and then applied weekly as long as the infestation persisted (three applications).

Damage ratings were taken at the 3-leaf stage, and then weekly until the rating no longer changed. Cotyledon-to-terminal heights were taken at the matchhead square stage, and open and closed boll counts were made at maturity. Yield was harvested from the center 7- by 25-foot section of each plot with a broadcast header.

Thrips pressure was extremely heavy in 2000 on these tests, particularly at Prattville. The untreated plots had a silvery tint from thrips damage, and many of these plants died. In plots with severe damage, the remaining plants branched out, which would cause problems to producers while harvesting and contribute to bark discounts.

The low rate of Temik (three pounds per acre) reduced damage surprisingly well, given the small amount per foot of row. The low rate of Temik also had the numerically highest yield at both locations, although this was not significantly different from most other treatments (see Tables 1 and 2). Higher rates of Temik (six to nine pounds per acre) were needed to suppress damage throughout the early growing season, and to contribute to earliness. Orthene foliar sprays controlled damage at E. V. Smith, but cotton at Prattville was damaged very early, with control increasing through the season. Gaucho seed treatment allowed more thrips damage, but this was not reflected in the final lint yield at either location.

TABLE 1. TEMIK AND THRIPS CONTROL FOR ULTRA NARROW ROW COTTON, E. V. SMITH FIELD CROPS UNIT, 2000

Treatment	Leaf injury[1]			Height *cm*	Open bolls *%*	Lint *lbs/ac*
	May 10	May 18	May 26	June 2	Aug. 9	Sept. 18
Untreated check	7.5	9.0	8.0	10.3	25	648
Temik, 3 lbs/ac	5.0	5.0	3.3	15.7	25	907
Temik, 6 lbs/ac	3.0	3.5	2.5	16.8	38	785
Temik, 9 lbs/ac	3.5	2.8	2.3	15.8	42	776
Temik, 12 lbs/ac	2.0	3.0	2.0	15.9	38	770
Gaucho 8 oz/cwt	5.5	6.0	5.5	14.7	33	775
Orthene,0.25 lb/ac	3.0	3.0	2.3	15.4	29	712
LSD (0.10)	**1.0**	**0.9**	**0.9**	**2.3**	**19**	**157**

[1] Injury scale: 0 = no injury; 10 = dead.

TABLE 2. TEMIK AND THRIPS CONTROL FOR ULTRA NARROW ROW COTTON, PRATTVILLE EXPERIMENT FIELD, 2000

Treatment	Leaf injury[1]			Height *cm*	Open bolls *%*	Lint *lbs/ac*
	May 10	May 18	May 26	June 2	Aug. 9	Sept. 18
Untreated check	7.8	8.8	9.5	3.3	8	484
Temik, 3 lbs/ac	4.3	6.0	6.5	14.8	34	779
Temik, 6 lbs/ac	3.3	4.5	4.8	15.3	45	647
Temik, 9 lbs/ac	2.8	4.0	4.5	16.7	60	752
Temik, 12 lbs/ac	2.0	5.0	4.8	14.3	44	768
Gaucho 8 oz/cwt	5.0	6.3	7.5	10.4	30	742
Orthene, 0.25 lb/ac	5.3	4.3	3.5	15.3	44	682
LSD (010)	**1.1**	**1.1**	**0.8**	**2.9**	**20**	**1 09**

[1] Injury scale: 0 = no injury; 10 = dead.

NEMATICIDE APPLICATIONS

EFFICACY OF ANHYDROUS AMMONIA FOR MANAGEMENT OF THE RENIFORM NEMATODE IN COTTON

Kathy S. McLean, William S. Gazaway, Aaron Palmateer, and James R. Akridge

The objective of this research was to determine the efficacy and economics of anhydrous ammonia for the management of reniform nematodes and its effect on cotton growth, development, and yield. The test was conducted in a field naturally infested with the reniform nematode and continuously cultured with cotton in Escambia County, Alabama. Anhydrous ammonia was compared to the fertilizer standard ammonium nitrate and to the nematicide standards Temik 15G and Telone II.

Anhydrous ammonia was injected with a modified ripper bedder. Anhydrous ammonia gas was propelled through flow regulators mounted on stainless steel delivery tubes attached to the trailing edge of the forward-swept chisels. The gas was injected 8 inches deep with one chisel per row. Rows were immediately hipped and bedded to seal and prevent rapid loss of the gas. All remaining rows were sub-soiled, hipped and bedded without applying the anhydrous ammonia.

Ammonium nitrate was applied over the row using a hand held granular applicator. Temik 15G, the standard recommenced nematicide, was applied at planting using granular chemical applicators attached to the planter. Telone II was applied using the same methods as the anhydrous ammonia. Di-Syston was included for early season insect control in the fertilizer treatments.

The experimental design was a randomized complete block with five replications. Plots consisted of four rows 25 feet long with a 40 inch row spacing. Replications were separated by a 20-foot border. All plots were maintained with standard production practices recommended by the Alabama Cooperative Extension System commonly used in the area.

Nematode population development was determined at monthly intervals throughout the season. Ten soil cores, 1-inch in diameter and 8 inches deep were collected from the two center rows of each plot in a randomized, systematic sampling pattern. Nematodes were extracted using a combination of gravity screening and sucrose centrifugation. Plots were rated at 28 days after planting to determine seedling emergence, stand uniformity, and plant vigor. Cotton was harvested utilizing a one-row cotton picker to determine the effects of the treatments on cotton yields.

Severe drought impacted cotton growth and development during the 2000 season. Reniform nematode numbers were low throughout the season due to the severely dry condition of the soil. However, the average nematode population over the entire season was numerically lower in the anhydrous ammonia and Telone II plots compared to the ammonium nitrate and Temik 15G (see table). Yields followed the same trend with the highest yield produced in the Telone II treatment followed by anhydrous ammonia at 90 and 120 units respectively.

EFFECT OF ANHYDROUS AMMONIA ON RENIFORM NEMATODE POPULATIONS AND SEED COTTON YIELD, ESCAMBIA COUNTY, ALABAMA

Treatment and rate	Reniform/150 cc of soil						Yield
	June 2	July 5	Aug. 2	Sept. 6	Oct. 3	Ave	*lbs/ac*
Anhydrous ammonia* 120 units/ac - preplant	196.8	71.5	142.2	51.3	70.5	106.46	1283
Anhydrous ammonia* 90 units/ac - preplant	135.3	66.0	60.2	59.5	145.2	93.24	1401
Ammonium nitrate* 90 units/ac - at plant	228.5	101.7	115.7	102.3	166.5	142.94	1150
Temik 15G 7 lb/ac - at plant + Ammonium nitrate 90 units/ac - at plant	226.0	82.8	107.3	83.5	139.8	127.88	1012
Telone II* 3 gal/ac - at plant + Ammonium nitrate 90 units/ac - at plant	132.8	45.8	70.3	79.3	196.2	104.88	1779
Deny* 1 pt/ac at plant + Ammonium nitrate 90 units/ac - at plant	207.5	98.2	161.8	68.2	264.2	159.98	1084
LSD (0.05)	**116.05**	**65.10**	**75.35**	**60.70**	**90.8**		**240**

Note: planting rate at 10 pounds per acre (five seed per foot of row); four rows 25 feet long with a 40 inch row spacing.

*Disyston (7 pounds per acre at planting) added in all treatments except the treatment consisting of Temik 15G 7 lb/ac - at plant + Ammonium nitrate 90 units/ac - at plant.

EFFECT OF POST-PLANT NEMATICIDES ON COTTON PRODUCTION IN RENIFORM NEMATODE INFESTED FIELDS

William S. Gazaway, James R. Akridge, and Don P. Moore

Previous studies in north Alabama showed significant cotton yield improvement in fields infested with reniform nematodes when post-plant nematicides were applied to plots that had been treated with a nematicide at planting. Both Temik 15G and Vydate increased yields significantly when applied to cotton at pinhead square. The purpose of these tests is to determine if post-plant applications of Temik 15G will produce similar results in central and south Alabama when applied to plots treated with either Temik 15G applied at planting or with Telone II (pre-plant fumigation).

Tests were conducted in two fields. A cotton field near Huxford, Escambia County, belonging to the Ward Brothers was selected in south Alabama. Cotton yields in this field have been drastically reduced as a result of heavy reniform nematode damage. A second field with a similar history of reniform nematode damage was selected in central Alabama on the Avant farm near Prattville. Henceforth, the south Alabama field will be referred to as the *Ward field* and the central Alabama field as the *Avant field.*

In the Avant field, plots were 25 feet long 36 inches wide and consisted of four rows, separated on each end by five-foot alleys. Plots were arranged in a randomized complete block design with six replications. Treatments are summarized in Table 1.

All plots were ripped and bedded up prior to fumigation. Telone was injected via a subsoil shank 18 inches deep to designated plots on April 27, 2000. On May 27, the cotton variety SureGrow 125 BG/RR was planted at a rate of five seed per foot. Specified rates of Temik 15G were applied in the seed furrow to designated plots at planting. Temik side dress applications were applied using a coulter to designated plots at pinhead square on June 27. Soil samples for nematode analyses were taken just prior to fumigation and approximately six weeks after seedling emergence. Appropriate insecticides were applied as needed for early season insect control. All other cultural practices were followed according to Auburn University recommendations.

In the Ward field, plots were 70 feet long and 36 inches wide and consisted of four rows, separated by five-foot alleys. Plots were arranged in a randomized complete block design with three replications. Treatments were like those in the Avant field except for treatment 3 (Temik 15G at 3.5 pounds per acre was applied instead of Telone II at five gallons per acre) and treatment 7 (Di-Syston 15G was applied in the furrow at planting instead of using the seed treatment *Adage* for early season insect control). Treatments are summarized in Table 2.

Plots were ripped and bedded up on April 18. Telone II was applied to designated plots on the same day. On May 31, the cotton variety DPL-655 BG/RR was planted at a rate of five seed per foot. Plots not receiving Temik 15G at planting were treated in the seed furrow with Di-Syston 15G at a rate of seven pounds per acre for early season insect control. Nematode soil samples were taken just prior to fumigation, approximately six weeks after seedling emergence, and at harvest.

Results for the Avant field test are summarized in Table 3. All nematicide treatments significantly increased cotton yields. However, there appeared to be no additional yield benefits from the side dress application of Temik 15G to either Temik at-plant treated plots or to Telone fumigated plots. Failure of the post-plant application of Temik to elicit a yield response could be due its inability to activate under extremely dry soil conditions that persisted at the time of and following application. The extremely low cotton yields in the test must be attributed to the exceedingly dry conditions that prevailed during most of the growing season. There appeared to be no correlation between yield response and nematode numbers.

Results for south Alabama (Ward Brothers farm) are summarized in Table 4. The higher rate of Temik 15G (seven pounds

TABLE 1. SUMMARY OF TREATMENTS IN THE AVANT FIELD

Treatment	Rate	Time of application
1. Telone II	3 gal/ acre	pre-plant fumigation
2. Telone II +	3 gal/ acre	pre-plant fumigation *plus*
Temik 15G	7 lb/ acre	side dress at pin head square
3. Telone II	5 gal/ acre	pre-plant fumigation
4. Temik 15G	5 lb/ acre	at planting
5. Temik 15G +	5 lb/ acre	at planting *plus*
Temik 15G	7 lb/ acre	side dress at pin head square
6. Temik 15G	7 lb/ acre	at planting
7. Adage		seed treatment

TABLE 2. SUMMARY OF TREATMENTS IN THE WARD FIELD

Treatment	Rate	Time of application
1. Telone II	3 gal/ acre	pre-plant fumigation
2. Telone II +	3 gal/ acre	pre-plant fumigation *plus*
Temik 15G	7 lb/ acre	side dress at pin head square
3. Temik 15G	3.5 lb/ acre	at planting
4. Temik 15G	5 lb/ acre	at planting
5. Temik 15G +	5 lb/ acre	at planting *plus*
Temik 15G	7 lb/ acre	side dress at pin head square
6. Temik 15G	7 lb/ acre	at planting
7. DiSyston 15G	7 lb/ acre	at planting

TABLE 3. RENIFORM POPULATION AND YIELD RESPONSE TO SIDE DRESS NEMATICIDE TREATMENTS IN CENTRAL ALABAMA[1]

Treatment, rate and time of application	Reniform per 100 cc soil April 27	July 10	Seed cotton *lbs/ac*
Telone 3 gal/ac, pre-plant	1227a	1971a	686a
Telone + Temik* 3 gal+7 lb/ac	2429a	1368a	653a
Telone 5 gal/ac, pre-plant	1766a	1523a	657a
Temik 5 lb/ac, at plant	1665a	2513a	597ab
Temik + Temik* 5 lb+ 7 lb/ac	2239a	1530a	698a
Temik 7 lb/ac, at plant	2128a	1832a	682a
Adage seed treatment	1747a	2510a	484b

[1]Avant Farm, Prattville, AL.
Means followed by the same letter do not significantly differ.

per acre) at planting and Telone treatments provided the highest cotton yields. Temik 15G side dress applications at pinhead square did not appear to improve cotton yield. Lack of activity from post-plant Temik applications could be due to the extremely dry weather conditions that prevailed throughout the season. All nematicide treatments produced greater yields than the untreated control.

Dry weather had more of an impact on cotton production than reniform nematode damage. Although some differences could be detected among nematicide treatments, these differences were slight when compared to the impact of dry weather on cotton production. More tests need to be conducted under better growing conditions to assess the real value of post-plant nematicide applications in cotton.

TABLE 4. RENIFORM POPULATION AND YIELD RESPONSE TO SIDE DRESS NEMATICIDE TREATMENTS IN SOUTH ALABAMA[1]

Treatment, rate and time of application	—Reniform per 100 cc soil— April 18	July 25	Nov. 7	Seed cotton *lbs/ac*
Telone 3 gal/ac, pre-plant	1443a	469b	1154a	1347a
Telone + Temik* 3 gal+7 lb/ac	1324a	228b	1203a	1293a
Temik 3.5 lb/ac, at plant	1206a	778ab	1038a	1241ab
Temik 5 lb/ac, at plant	975a	823ab	1333a	1075ab
Temik + Temik* 5 lb+ 7 lb/ac	1617a	1320a	1285a	1199ab
Temik 7 lb/ac, at plant	1059a	1353a	1292a	1319a
Di-Syston 7 lb/ac, at plant	1061a	1251a	2595a	1008b

[1]Ward Brothers Field- Huxford, AL.
Means followed by the same letter do not significantly differ.

FALL FUMIGATION VERSUS SPRING FUMIGATION FOR RENIFORM NEMATODE CONTROL IN HEAVILY INFESTED COTTON FIELDS

William S. Gazaway

Telone II has been shown to be an effective nematicide when applied under proper soil conditions. Unlike previous fumigants, Telone II is most effective when applied to drier soil at warmer temperatures. It does not perform adequately when applied to overly wet and cooler soils–conditions that are often present in the spring when much of the cotton planting is done. The purpose of this experiment is to compare an application of Telone II made in the fall when the conditions are more favorable for the fumigant to (1) a Telone application and (2) the conventional Temik application in the spring.

Plots contained four rows and were 50 feet long. Treatments were arranged in a randomized complete block design and replicated five times. The entire test area of the field was disked and subsoiled on November 16, 1998. At the same time two rates of Telone II (three and five gallons per acre, respectively) were injected in assigned plots. The following spring, Telone was applied on May 11 1999. Temik was applied in-furrow when cotton (DPL 655BG/RR) was planted on May 22. Nematode samples were pulled on November 1 1998, February 10 1999, May 11, July 22, and October 21. The two center rows of each plot were harvested on October 21.

The same test was repeated in the fall 1999-2000 growing season. The Telone fall application rates were applied on November 16 1999 and the spring rate was applied April 4 2000. Temik 15G and Di-Syston 15G were not applied until May 29 during planting due to very dry soils. Nematode soil samples were taken on October 5 1999, April 18 2000, July 25, and November 7. Plots were harvested on November 7.

In 1999, all nematicides outproduced the untreated plots (Table 1). The Telone fall and spring applications outperformed Temik by a slight margin. This could be due to the fact that Temik was applied to a rather dry soil on May 21, 1999 and may not have been activated properly. The field remained dry until June 2. In addition, the untreated plots yielded reasonably well, indicating that growing conditions for cotton for the remainder of the season were rather good. Without stress on the cotton, reniform damage was most likely kept at a minimum.

In the 2000 season, yields were reduced in all treatments due to extremely dry conditions throughout the growing season. Temik did not activate due to extremely dry conditions at planting. Telone II fall and spring applications produced the higher yields (Table 1).

TABLE 1. FALL AND SPRING FUMIGATION IMPACT ON COTTON YIELD IN RENIFORM INFESTED FIELDS (1999 AND 2000)

Nematicide	Rate/ac	Time of application	Seed cotton yield — lbs/ac — 1999	2000
Telone II	3 gal.	Fall	2312a	1711a
Telone II	5 gal.	Fall	2313a	1666a
Telone II	3 gal.	Spring	2193a	1663a
Temik 15G	7 lb.	At-planting	2095ab	1110b
Di-Syston 15G	7 lb.	At-planting	1961b	1077b
LSD(0.05)			**205**	**344**

Means followed by the same letter do not significantly differ.

HERBICIDE APPLICATIONS

EVALUATION OF CGA 362622 FOR WEED CONTROL IN COTTON

Michael G. Patterson and Wilson H. Faircloth

A new herbicide (CGA 362622) developed by Syngenta (formerly Novartis) is being tested for postemergence weed control in cotton around the country. This product is a new generation herbicide and active use rates are about 100 times lower than older herbicides developed in the 1960s and 1970s. The proposed common name is trifloxysulfuron, and its mode of action is similar to other sulfonylurea herbicides like Staple and Classic. The product controls primarily broadleaf weeds; however, 362622 has activity on nutsedge as well.

This product was evaluated for weed control in cotton at several sites in Alabama in 1999 and 2000. Data obtained in most trials included visual crop injury and weed control ratings. The activity of 362622 at two rates was compared to Staple and Roundup Ultra on weeds approximately 4 to 5 inches tall in Roundup Ready cotton (see table). Crop injury was minimal and transient in all trials.

The labeled use rate for CGA 362622 has not been determined, but would likely fall in the range shown in the table. Smaller weeds are controlled to a higher degree than indicated in the table. CGA 362622 may fit in a tank mix with either Staple or Roundup to increase weed efficacy in certain situations. One advantage of this product is that it could be used on all cotton varieties.

EFFICACY OF CGA 362622 FOR WEED CONTROL IN ROUNDUP READY COTTON, TENNESSEE VALLEY RESEARCH AND EXTENSION CENTER, BELLE MINA, ALABAMA, 2000

Treatment	Rate *lbs ai/ac*	Velvet-leaf	Entireleaf morningglory	Sickle-pod
			%	
Untreated	—	0	0	0
CGA 362	0.0045	48	46	47
CGA 362	0.0067	37	40	62
Staple	0.063	65	46	8
Roundup Ultra	0.75	56	52	80

POTENTIAL FOR WEED SPECIES SHIFTS IN ROUNDUP READY COTTON

Michael G. Patterson and Wilson H. Faircloth

Field trials partially supported by cotton checkoff funds were conducted at the Tennessee Valley Research and Extension Center (TVREC) and the E. V. Smith Research Center (EVSRC) to evaluate a series of treatments for their potential to increase weed tolerance to glyphosate herbicide. The dominate weed species at TVREC was pitted morningglory while the dominate species at EVSRC was sicklepod.

At both TVREC and EVSRC, plot size was four rows by 25 feet. Initial morningglory populations in the test area at TVREC exceeded 100 plants per plot while initial sicklepod populations at EVSRC exceeded 200 plants per plot. Data obtained were visual weed control and counts, following herbicide applications, and seed cotton yield. SureGrow 125 B/R was planted at TVREC, and SureGrow 501 B/R cotton was planted at EVSRC.

Following soil-applied herbicide treatments at planting, foliar applications were applied either at cotton growth stages of 1st leaf, 4th leaf, 8th leaf, 12th leaf, or combinations thereof. Herbicides were applied over the top at 1st leaf and 4th leaf timings and post directed at 8th leaf and 12th leaf timings. A hand hoed weedfree treatment was also included for comparison.

Data from TVREC shows Roundup-only treatments at either one pint or two pints per application provided late-season morningglory control and seed cotton yields equal to the hand-hoed control or treatments containing herbicides with different modes of action (see Table 1). First year data indicate that Roundup-only systems are performing as well as systems containing other herbicides. Although not shown, higher weed counts following initial applications at the low Roundup rate were subsequently decreased with followup applications.

Initial sicklepod populations at EVSRC were approximately twice the level of morningglory populations observed at TVREC (see Table 2). Both Roundup-only systems resulted in higher weed counts at late season than the systems that included alternative herbicides. However, sicklepod plants remaining in the plots at this time were not large enough to cause yield loss. They will, however, provide more seed for next year's study.

In summary, sicklepod appears to be the most difficult of these two species to manage with a Roundup-only system. Subsequent years results may provide insight into the effect of uncontrolled weeds on seed buildup.

TABLE 1. MORNINGGLORY CONTROL, WEED COUNTS, AND SEED COTTON YIELDS, TENNESSEE VALLEY RESEARCH AND EXTENSION CENTER, BELLE MINA, ALABAMA[1]

Treatment	Control *%*	Weeds *no/plot*	Yield *lbs/plot*
Roundup 1.0pt at 1lf, 4lf, and 12lf	94	6	1638
Roundup 2.0pt at 1lf, 4lf, and 12 lf	96	4	1630
Roundup 1pt + Staple 0.8oz at 1lf Roundup 1.5pt at lf Roundup 1 pt at 12lf	99	1	1546
Meturon 3 pt pre Roundup 1 pt + Staple 0.8oz at 4lf Roundup 1pt at 12lf	94	4	1660
Hand hoed	96	4	1682

[1]Data were collected on August 4, 2000.

TABLE 2. MORNINGGLORY CONTROL, WEED COUNTS, AND SEED COTTON YIELDS, E.V.SMITH RESEARCH CENTER, SHORTER, ALABAMA[1]

Treatment	Control *%*	Weeds *no/plot*	Yield *lbs/plot*
Roundup 1.0pt at 1lf, 4lf, and 12lf	86	25	1802
Roundup 2.0pt at 1lf, 4lf, and 12 lf	88	21	1910
Roundup 1pt + Staple 0.8oz at 1lf Roundup 1.5pt at lf Roundup 1 pt at 12lf	94	10	1788
Meturon 3 pt pre Roundup 1 pt + Staple 0.8oz at 4lf Roundup 1pt at 12lf	97	4	1560
Hand hoed	88	21	1423

[1]Data were collected on August 15, 2000.

FUNGICIDE APPLICATIONS

EVALUATION OF EXPERIMENTAL SEED TREATMENTS FOR CONTROL OF SEEDLING DISEASE OF COTTON

Kathy S. McLean, H. L. Campbell, Aaron Palmateer, and Bobby E. Norris

The objective of this research was to evaluate experimental seed treatment fungicides for control of seedling disease of cotton. Two tests were planted April 20 at the 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. All fungicides were applied to the seed as seed treatments before planting. Test one was infested with millet seed colonized with *Pythium* spp. and *Rhizoctonia solani* and test two was left naturally infested.

In both tests, 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 six replications. Blocks were separated by a 20-foot alley. The nematicide Temik 15G (at five 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, skip index, and vigor ratings were recorded at two, four, and six weeks after planting to determine the percent seedling loss, stand density, and seedling vigor due to cotton seedling disease. The number of open bolls were counted August 30 to indicate plant maturity. Plots were harvested September 19.

Cotton seedling disease pressure was moderate in the *Pythium* spp. and *R. solani* infested test. Significant differences in seedling stand were observed only at four weeks after planting (Table 1). At four weeks after planting, Delta Coat Ad + Nu-Flow M + PGE 143 + PGE 146 and Apron TL + Nu-Flow T + Nu-Flow M produced significantly greater stands than the Apron TL + Nu-Flow T + Nu-Flow M + PGE 143 + PGE 146 seed treatment. No seed treatment produced a significantly lower skip index, indicating a more evenly spaced seedling stand than the control at six weeks after planting. No significant differences were observed in the number of open bolls on five plants per plot. Seed cotton yields varied 310 pounds per acre in the Apron TL + Nu-Flow T + Nu-Flow M + PGE 143 + PGE 144 and the Apron TL + Nu-Flow T + Nu-Flow M + PGE 143 + PGE 146 seed treatments, respectively. The average yield of seed cotton from the fungicide-treated plots was not greater than the yield of the untreated control.

Cotton seedling disease incidence was light in the naturally infested test. Significant differences in seedling stand were observed at two, four, and six weeks after planting (Table 2). At two weeks after planting, Apron TL + Nu-Flow T + Nu-Flow M + PGE

TABLE 1. EFFICACY OF EXPERIMENTAL SEED TREATMENT FUNGICIDES ON COTTON SEEDLING DISEASE ENHANCED WITH *PYTHIUM* SPP. AND *RHIZOCTONIA SOLANI*, TENNESSEE VALLEY RESEARCH AND EXTENSION CENTER, BELLE MINA, ALABAMA

Treatment[1]	Rate formulated product *fl oz/cwt*	Stand[2] May 2	Stand[2] May 17	Stand[2] May 31	Skip index[3] May 31	Seed cotton *lbs/ac* Sept. 19
Untreated control	—	44	80	78	2.5	3790
RTU Baytan-Thiram + Apron FL	3.0 + 0.75	45	84	81	2.3	3659
Delta Coat AD + NU-Flow M	11.75 + 1.25	41	88	86	0.7	3738
Delta Coat AD + Nu-Flow M + PGE 143 + PGE 144	11.75 + 1.25 +0.035 +0.035	46	83	80	1.8	3581
Delta Coat AD + Nu-Flow M + PGE 143 + PGE 146	11.75 + 1.25 +0.035 +0.035	39	90	84	1.7	3738
Apron TL + Nu-Flow T + Nu-Flow M	2.0 + 2.25 + 1.25	44	90	85	1.5	3581
Apron TL + Nu-Flow T + Nu-Flow M + PGE 143 + PGE 144	2.0 + 2.25 +1.25 +0.035 + 0.035	43	83	80	1.7	3836
Apron TL + Nu-Flow T + Nu-Flow M + PGE 143 + PGE 146	2.0 + 2.25 +1.25 +0.035 + 0.035	37	79	77	2.8	3526
LSD (0.05)		**15**	**10**	**9**	**2.3**	**225**

[1] All treatments were applied to seeds.
[2] Number of live seedlings per 25 feet of row; all rows received 125 seed of 'DPL 33B'.
[3] Skip index ratings based on 25 feet of row. Ratings correspond to distance of skipped plants; for example: 1 = 1-foot gap; 2 = 2-foot gap; and so on to 25 = no plants.
Means compared using Fisher's protected least significant difference test (P=0.05).

143 + PGE 144 produced significantly greater stands than the untreated control. However, by four and six weeks after planting, Delta Coat AD + Nu-Flow M + PGE 143 + PGE 146 produced greater stands than Delta Coat AD + Nu-Flow M and Delta Coat + AD + Nu-Flow M+ PGE 144. No seed treatment produced a significantly lower skip index, indicating a more evenly spaced seedling stand than the control at six weeks after planting. No significant differences were observed in the number of open bolls on five plants per plot. Seed cotton yields varied 209 pounds per acre for the Apron TL + Nu-Flow T + Nu-Flow M seed treatment and the Apron TL + Nu-Flow T + Nu-Flow M + PGE 143 + PGE 144 seed treatment, respectively. The average yield of seed cotton from the fungicide-treated plots was not greater than the yield of the untreated control.

TABLE 2. EFFICACY OF EXPERIMENTAL SEED TREATMENT FUNGICIDES ON COTTON SEEDLING DISEASE, TENNESSEE VALLEY RESEARCH AND EXTENSION CENTER, BELLE MINA, ALABAMA

Treatment[1]	Rate formulated product *fl oz/cwt*	Stand[2]			Skip index[3]	Seed cotton *lbs/ac*
		May 2	May 17	May 31	May 31	Sept. 19
Untreated control	—	57	94	95	0.6	3581
RTU Baytan-Thiram + Apron FL	3.0 + 0.75	60	98	100	0.3	3555
Delta Coat AD + NU-Flow M	11.75 + 1.25	53	91	92	0.7	3476
Delta Coat AD + Nu-Flow M + PGE 143 + PGE 144	11.75 + 1.25 +0.035 +0.035	51	89	92	0.2	3528
Delta Coat AD + Nu-Flow M + PGE 143 + PGE 146	11.75 + 1.25 +0.035 +0.035	59	100	102	0.3	3424
Apron TL + Nu-Flow T + Nu-Flow M	2.0 + 2.25 + 1.25	61	95	97	0.3	3633
Apron TL + Nu-Flow T + Nu-Flow M + PGE 143 + PGE 144	2.0 + 2.25 +1.25 +0.035 + 0.035	72	97	98	0.0	3424
Apron TL + Nu-Flow T + Nu-Flow M + PGE 143 + PGE 146	2.0 + 2.25 +1.25 +0.035 + 0.035	60	93	93	0.3	3502
LSD (0.05)		**14**	**10**	**11**	**0.7**	**348**

[1] All treatments were applied to seeds.
[2] Number of live seedlings per 25 feet of row; all rows received 125 seed of DPL 33B.
[3] Skip index ratings based on 25 feet of row. Ratings correspond to distance of skipped plants; for example: 1 = 1-foot gap; 2 = 2-foot gap; and so on to 25 = no plants.
Means compared using Fisher's protected least significant difference test (P=0.05).

EVALUATION OF SELECTED IN-FURROW FUNGICIDES FOR CONTROL OF SEEDLING DISEASE OF COTTON

K. S. McLean, H. L . Campbell, Aaron Palmateer, Bobby E. Norris, Larry W. Wells, and Don P. Moore

The objective of this research was to evaluate in-furrow fungicides for control of seedling disease of cotton. This cotton fungicide test was planted at three locations including the Tennessee Valley Research and Extension Center in Belle Mina, the Prattville Experiment Field in Prattville, and the Wiregrass Research and Extension Center in Headland. These fields have a history of cotton seedling disease. Fungicides were applied as a seed treatment or as an in-furrow or spray or granular application at planting. All in-furrow fungicide sprays were applied with flat tip 8002E nozzles calibrated to deliver 20 gallons per acre at 30 pounds per square inch. 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 six replications. Each plot was infested with millet seed inoculated with *Pythium* spp. and *Rhizoctonia solani*. Blocks were separated by a 20-foot alley. The nematicide Temik 15G (five 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, skip index, and vigor ratings were recorded at two, four, and six weeks after planting to determine the percent seedling loss, stand density, and seedling vigor due to cotton seedling disease. Plots were harvested and data recorded.

At the Tennessee Valley Research and Extension Center, cotton seedling disease incidence was moderate. Significant differences in seedling stand were observed at two, four, and six weeks after planting (Table 1). At two weeks after planting, Terraclor 4F and Ridomil Gold PC produced significantly greater stands than Rovral 4CF. By four weeks after planting, Ridomil Gold PC, Terraclor 15G, Terraclor Super X 18.8G, Terraclor 4 F, and Terraclor 15G all produced greater stands than the control. By six weeks after planting, Ridomil Gold PC, Terraclor 15G, Terraclor Super X 18.8G, Terraclor 4F, Terraclor 15G, and Terraclor EC all produced greater stands than the control. At six weeks after planting, these fungicides also produced a significantly lower skip index, indicating a more evenly spaced seedling stand than the control. Seed cotton yields varied over 588 pounds per acre for the Terraclor Super X 18.8G and the Rovral 4CF, respectively. Terraclor Super X 18.8G, Terraclor 4F, Ridomil Gold, Quadris, and Ridomil Gold PC all produced significantly greater yields than the control. The average yield of seed cotton from the fungicide-treated plots was 196 pounds greater than the yield of the untreated control.

At the Prattville Experiment Field cotton seedling disease incidence and severity were moderate and severe drought affected yields. Significant differences in seedling stand were observed at two and four weeks after planting (Table 2). At two weeks after planting, Quardis 2SC,Terraclor 4F, Rovral 4CF, and Delta Coat AD treatments produced significantly greater stands than the untreated control. At four and six weeks after planting, Quardis 2SC, Rovral 4CF, Terraclor 4F, Terraclor 2E, Terraclor Super X 2EC, Ridomil PC 11G, and Delta Coat AD treatments significantly improved stands compared to the untreated control. These treatments produced a significantly lower skip index, indicating a more evenly spaced seedling stand compared to the control at six weeks after planting. Seed cotton yields varied 242 pounds per acre in the Delta Coat AD and the Rovral 4F (5.2 fluid ounces per acre) treatments, respectively. The average yield of seed cotton from the eleven fungicide-treated plots was not greater than the yield of the untreated control.

At the Wiregrass Research and Extension Center, cotton seedling disease incidence was moderate and a severe drought affected yields. Significant differences in seedling stand were observed at two and four weeks after planting (Table 3). At two weeks after planting, Quardis 2SC and both

TABLE 1. EFFICACY OF SELECTED IN-FURROW FUNGICIDES ON SUREGROW 125B/RR COTTON SEEDLING DISEASE AT TENNESSEE VALLEY RESEARCH AND EXTENSION CENTER IN NORTH ALABAMA

Treatment and rate formulated product	Application treatment	Stand[1] May 2	Stand[1] May 17	Stand[1] May 31	Skip index[2] May 31	Seed cotton *lbs/ac* Sept. 19
Untreated control		25	55	53	14.8	3055
Terraclor Super X 18.8G 5.5 lb/ac	In furrow	27	75	76	4.7	3523
Terraclor Super X EC 48 fl oz/ac	In furrow	25	66	65	5.3	3194
Terraclor 2E 48 fl oz/ac	In furrow	24	66	68	3.8	3113
Terraclor 15G 5 lb/ac	In furrow	28	80	78	2.8	3181
Terraclor 4F 24 fl oz/ac	In furrow	33	72	70	5.7	3474
Rovral 4CF 5.2 fl oz/ac	In furrow	22	54	54	12.2	2993
Rovral 4CF 6 fl oz/ac	In furrow	27	51	54	14.7	2935
Ridomil Gold 11 PC 7 lb/ac	In furrow	33	83	81	2.7	3327
Quadris 2SC 5.56 fl oz/ac	In furrow	26	57	53	13.7	3348
Delta Coat AD 11.75 fl oz/ac	Seed	31	63	60	9.0	3314
Ridomil Gold 0.075 fl oz/1000 ft	In furrow	29	62	51	12.5	3379
LSD (0.05)		**9**	**10**	**8**	**4.9**	**311**

[1] Number of live seedlings per 25 feet of row; all rows received 125 SureGrow 125 B/RR seed.
[2] Skip index ratings based on 25 feet of row. Ratings correspond to distance of skipped plants; for example: 1 = 1-foot gap; 2 = 2-foot gap; and so on to 25 = no plants.
Means compared using Fisher's protected least significant difference test (P=0.05).

TABLE 2. EFFICACY OF SELECTED IN-FURROW FUNGICIDES ON SUREGROW 125B/RR COTTON SEEDLING DISEASE AT PRATTVILLEY EXPERIMENT FIELD IN CENTRAL ALABAMA

Treatment and rate formulated product	Application treatment	Stand[1] April 25	Stand[1] May 10	Stand[1] May 24	Skip index[2] May 24	Seed cotton *lbs/ac* Aug. 30
Untreated control		55	46	47	20.7	1404
TSX 18.8G 5.5 lb/ac	In furrow	57	53	54	16.0	1295
TSX EC 48 fl oz/ac	In furrow	59	59	63	11.7	1399
Terraclor 2E 48 fl oz/ac	In furrow	63	57	58	13.0	1307
Terraclor 15G5 lb/ac	In furrow	59	56	53	16.7	1258
Terraclor 4F 24 fl oz/ac	In furrow	69	67	67	10.3	1375
Rovral 4CF 5.2 fl oz/ca	In furrow	68	62	65	11.0	1203
Rovral 4CF 6 fl oz/ac	In furrow	63	59	60	12.0	1314
Ridomil Gold PC 11G 7 lb/ac	In furrow	61	58	59	14.7	1234
Quadris 2SC 5.56 fl oz/ac	In furrow	76	73	72	7.3	1379
Delta Coat AD 11.75 fl oz/cwt	Seed	66	64	64	9.3	1445
Ridomil Gold 4EC 0.075 fl oz/1000 ft	In furrow	53	49	49	19.3	1300
LSD (0.05)		**12**	**11**	**10**	**7.7**	**169**

[1] Number of live seedlings per 30 feet of row; all rows received 150 SureGrow 125 RP seed.
[2] Skip index ratings based on 25 feet of row. Ratings correspond to distance of skipped plants; for example: 1 = 1-foot gap; 2 = 2-foot gap; and so on to 25 = no plants.
Means compared using Fisher's protected least significant difference test (P=0.05).

rates of Rovral 4CF produced significantly greater stands than the untreated control. At four weeks after planting, Quardis 2SC, Rovral 4CF(5.2 fluid ounces per acre), and Terraclor 2E treatments significantly improved stands compared to the untreated control. However, no treatment produced a significantly lower skip index, indicating a more evenly spaced seedling stand compared to the control at six weeks after planting. Seed cotton yields varied 889 pounds per acre in the Rovral 4CF and the Quadris 2SC treatments, respectively. The average yield of seed cotton from the ten fungicide-treated plots was 382 pounds greater than the yield of the untreated control.

TABLE 3. EFFICACY OF SELECTED IN-FURROW FUNGICIDES ON STONEVILLE 474 COTTON SEEDLING DISEASE AT WIREGRASS RESEARCH AND EXTENSION CENTER IN SOUTHEAST ALABAMA

Treatment and rate formulated product	Application treatment	Stand[1] May 5	Stand[1] May 19	Stand[1] June 2	Skip index[2] June 2	Seed cotton *lbs/ac* Oct. 23
Untreated control		65	72	70	3.7	1295
Terraclor Super X 18.8G 5.5 lb/ac	In furrow	62	68	68	5.2	1759
Terraclor Super X EC 48 fl oz/ac	In furrow	72	77	74	3.5	1953
Terraclor 2E 48 fl oz/ac	In furrow	65	80	76	2.0	1643
Terraclor 15G lb/ac	In furrow	65	73	69	2.7	1875
Terraclor 4F 24 fl oz/ac	In furrow	70	77	74	3.8	1972
Rovral 4 CF 5.2 fl oz/ac	In furrow	75	81	80	2.5	2068
Rovral 4 CF 6 fl oz/ac	In furrow	73	76	75	4.0	1469
Ridomil Gold 7 lb/ac	In furrow	65	72	69	6.3	1469
Quadris 2 SC 5.56 fl oz/ac	In furrow	77	83	79	2.5	1179
Ridomil Gold PC 0.075 fl oz/1000 ft	In furrow	73	78	75	5.0	1392
LSD (0.05)		**11**	**11**	**14**	**4.0**	**404**

[1]Number of live seedlings per 25 feet of row; all rows received 125 seed.
[2]Skip index ratings based on 25 feet of row. Ratings correspond to distance of skipped plants; for example: 1 = 1-foot gap; 2 = 2-foot gap; and so on to 25 = no plants. Means compared using Fisher's protected least significant difference test (P=0.05).

EVALUATION OF SELECTED IN-FURROW FUNGICIDES FOR CONTROL OF NATURAL INFESTATIONS OF SEEDLING DISEASE OF COTTON

Kathy S. McLean, H. L . Campbell, Aaron Palmateer, Bobby E. Norris, Don P. Moore, and Larry W. Wells

The objective of this research was to evaluate in-furrow fungicides for control of natural infestations of seedling disease of cotton. This cotton fungicide test was planted at three locations including the Tennessee Valley Research and Extension Center in Belle Mina, the Prattville Experiment Field in Prattville, and the Wiregrass Research and Extension Center in Headland. These fields have a history of cotton seedling disease. Fungicides were applied as a seed treatment or as an in-furrow or spray or granular application at planting. All in-furrow fungicide sprays were applied with flat tip 8002E nozzles calibrated to deliver 20 gallons per acre at 30 pounds per square inch. In-furrow granular applications were applied with chemical granular applicators attached to the planter.

Plots consisted of two rows, 25 or 30 feet long with a 36- or 40-inch wide row spacing. The plots were arranged in a randomized complete block design with six replications. Blocks were separated by a 20-foot alley. The nematicide Temik 15G (five 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, skip index, and vigor ratings were recorded at two, four, and six weeks after planting to determine the percent seedling loss, stand density, and seedling vigor due to cotton seedling disease. Plots were harvested and data recorded.

Cotton seedling disease incidence and severity was light to moderate at the Tennessee Valley Research and Extension Center in Belle Mina. Significant differences in seedling stand were observed at two, four, and six weeks after planting (Table 1). At two weeks after planting, Quardis 2SC produced significantly greater stand than the untreated control. Compared to the untreated control, stands were significantly improved at four weeks after planting by seven of the fungicides and at six weeks after planting by nine of the herbicides. However, no treatment produced a significantly lower skip index, indicating a more evenly spaced seedling stand compared to the control at six weeks after planting. Seed cotton yields ranged from 3,920.40 pounds per acre to 3,444.70 pounds per acre for the Quadris 2 SC and the Ridomil Gold PC treatments, respectively. The average yield of seed cotton from the eleven fungicide-treated plots was not greater than the yield of the untreated control.

Cotton seedling disease incidence and severity was light and a severe drought affected yields at the Prattville Experiment Field in Prattville. Significant differences in seedling stand were not observed at two, four, or six weeks after planting (Table 2). At six weeks after planting, stands ranged from 2.7 to 2.46 plants per

TABLE 1. EFFICACY OF SELECTED IN-FURROW FUNGICIDES ON SUREGROW 125B/RR COTTON SEEDLING DISEASE AT TENNESSEE VALLEY RESEARCH AND EXTENSION CENTER

Treatment and rate formulated product	Application treatment	Stand[1]			Skip index[2]	Seed cotton *lbs/ac*
		May 2	May 17	May 31	May 31	Sept. 19
Untreated control	—	43	78	84	4.3	3855
Terraclor Super X 18.8G 5.5 lb/ac	In furrow	50	79	84	5.0	3547
Terraclor Super X EC 48 fl oz/ac	In furrow	44	77	86	4.7	3667
Terraclor 2E 48 fl oz/ac	In furrow	37	77	92	3.7	3693
Terraclor 15G 5 lb/ac	In furrow	43	84	93	4.0	3607
Terraclor 4F 24 fl oz/ac	In furrow	49	88	93	5.0	3468
Rovral 4CF 5.2 fl oz/ac	In furrow	46	84	94	3.7	3871
Rovral 4CF 6 fl oz/ac	In furrow	49	82	91	5.0	3547
Ridomil Gold PC 7 lb/ac	In furrow	42	82	89	4.0	3445
Quadris 2SC 5.56 fl oz/ac	In furrow	59	90	100	3.0	3920
Delta Coat AD 11.75 oz/cwt	Seed	39	70	75	5.3	3484
Ridomil Gold 4EC 1.0fl oz/ac	In furrow	45	85	100	3.5	3724
LSD (0.05)		**16**	**11**	**10**	**2.8**	**274**

[1] Number of live seedlings per 25 feet of row; all rows received 125 seed of SureGrow 125 B/RR.
[2] Skip index ratings based on 25 feet of row. Ratings correspond to distance of skipped plants; for example: 1 = 1-foot gap; 2 = 2-foot gap; and so on to 25 = no plants. Means compared using Fisher's protected least significant difference test (P=0.05).

TABLE 2. EFFICACY OF SELECTED IN-FURROW FUNGICIDES ON SUREGROW 125B/RR COTTON SEEDLING DISEASE AT PRATTVILLE EXPERIMENT FIELD

Treatment and rate formulated product	Application treatment	Stand[1]			Skip index[2]	Seed cotton *lbs/ac*
		April 25	May 10	May 24	May 24	Aug. 30
Untreated control		93	79	67	5.7	1597
TSX 18.8G 5.5 lb/ac	In furrow	85	75	74	3.3	1568
TSX EC48 fl oz/ac	In furrow	89	85	80	3.3	1408
Terraclor 2E 48 fl oz/ac	In furrow	92	86	74	3.3	1421
Terraclor 15G 5 lb/ac	In furrow	86	75	74	5.0	1525
Terraclor 4F 24 fl oz/ac	In furrow	90	76	80	4.7	1525
Rovral 4CF 5.2 fl oz/ac	In furrow	86	83	78	4.0	1411
Rovral 4CF 6 fl oz/ac	In furrow	83	78	81	2.7	1602
Ridomil PC 11G 7 lb/ac	In furrow	88	75	81	2.7	1435
Quadris 2SC 5.56 fl oz/ac	In furrow	95	85	79	3.7	1556
Delta Coat AD 11.75 fl oz/cwt	Seed	89	75	74	3.3	1517
Ridomil Gold 4EC 1.0 fl oz/ac	In furrow	85	74	75	5.3	1520
LSD (0.05)		**15**	**15**	**13**	**2.7**	**167**

[1] Number of live seedlings per 30 feet of row; all rows received 150 seed of SureGrow 125 RP.
[2] Skip index ratings based on 25 feet of row. Ratings correspond to distance of skipped plants; for example: 1 = 1-foot gap; 2 = 2-foot gap; and so on to 25 = no plants. Means compared using Fisher's protected least significant difference test (P=0.05).

foot of row with the control measuring 2.57 plants. Rovral 4CF and Ridomil Gold PC 11G produced a significantly lower skip index, indicating a more evenly spaced seedling stand compared to the control at six weeks after planting. Seed cotton yields varied 194 pounds per acre in the Rovral 4F six fluid ounces per acre and the Terraclor Super X EC treatments, respectively. The average yield of seed cotton from the eleven fungicide-treated plots was not greater than the yield of the untreated control.

Cotton seedling disease incidence was light and a severe drought affected yields at the Wiregrass Research and Extension Center in Headland. Significant differences in seedling stand were not observed at two and six weeks after planting (Table 3). At four weeks after planting Terraclor Super X 18.8G, Ridomil Gold PC, and Quadris 2SC produced significantly greater stands than Terraclor Super X 2EC. Plant stands ranged from a high of 2.54 to a low of 2.12 at six weeks after planting. No fungicide treatment produced a significantly lower skip index, indicating a more evenly spaced seedling stand compared to the control at six weeks after planting. Seed cotton yields varied 851 pounds per acre for the Terraclor 15G and the Ridomil Gold treatments, respectively. The average yield of seed cotton from the ten fungicide-treated plots was 390 pounds per acre greater than the yield of the untreated control.

TABLE 3. EFFICACY OF SELECTED IN-FURROW FUNGICIDES ON SUREGROW 125B/RR COTTON SEEDLING DISEASE AT WIREGRASS RESEARCH AND EXTENSION CENTER

Treatment and rate formulated product	Application treatment	Stand[1] May 5	Stand[1] May 19	Stand[1] June 2	Skip index[2] June 2	Seed cotton *lbs/ac* Oct. 23
Untreated control		66	65	62	7.8	1199
Terraclor Super X18.8G 5.5 lb/ac	In-furrow	64	67	63	7.7	1431
Terraclor Super X2EC 48 fl oz/ac	In-furrow	56	53	53	13.3	1701
Terraclor 2E 48 fl oz/ac	In-furrow	57	57	54	9.3	1759
Terraclor 15G 5 lb/ac	In-furrow	55	60	56	8.8	2030
Terraclor 4F 24 fl oz/ac	In-furrow	57	57	55	11.5	1469
Rovral 4 CF 5.2 fl oz/ac	In-furrow	60	62	59	7.8	1489
Rovral 4 CF 6 fl oz/ac	In-furrow	58	60	57	9.2	1411
Ridomil Gold 7 lb/ac	In-furrow	63	65	63	6.3	1914
Quadris 2 SC 5.56 fl oz/ac	In-furrow	62	66	64	8.3	1179
Ridomil Gold 4 EC 1.0 fl oz/ac	In-furrow	64	62	57	11.0	1295
LSD (0.05)		**11**	**12**	**12**	**7.9**	**429**

[1] Number of live seedlings per 25 feet of row; all rows received 125 seed of SureGrow 125 B/RR.
[2] Skip index ratings based on 25 feet of row. Ratings correspond to distance of skipped plants; for example: 1 = 1-foot gap; 2 = 2-foot gap; and so on to 25 = no plants. Means compared using Fisher's protected least significant difference test (P=0.05).

EVALUATION OF EXPERIMENTAL IN-FURROW FUNGICIDE COMBINATION TREATMENTS FOR CONTROL OF SEEDLING DISEASE OF COTTON

Kathy S. McLean, H. L. Campbell, Aaron Palmateer, Bobby E. Norris, and Don P. Moore

The objective of this research was to evaluate in-furrow fungicide combination treatments for control of seedling disease of cotton. This cotton fungicide test was planted at three locations including the Tennessee Valley Research and Extension Center in Belle Mina and the Prattville Experiment Field in Prattville. These fields have a history of cotton seedling disease.

Fungicides were applied as a seed treatment or as an in-furrow or spray or granular application at planting. All in-furrow fungicide sprays were applied with flat tip 8002E nozzles calibrated to deliver 20 gallons per acer at 30 pounds per square inch. 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 six replications Blocks were separated by a 20-foot alley. The nematicide Temik 15G (five 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, skip index, and vigor ratings were recorded at two, four, and six weeks after planting to determine the percent seedling loss, stand density, and seedling vigor due to cotton seedling disease. Plots were harvested and data recorded.

Seedling disease incidence and severity were moderate at the Tennessee Valley Research and Extension Center in north Alabama. Significant differences in seedling stand were observed at four and six weeks after planting (Table 1). At four weeks after planting, the stand in the Ridomil G + CGA-279202 (0.04 + 0.125 pound active ingredient per acre) treatment was significantly greater than the Delta Coat AD and Quadris 2SC at the high rate. By six weeks after planting, Ridomil G + Rovral 4F, Ridomil G + PCNB, and Ridomil Gold + Terraclor 4 F produced better stands than Delta Coat AD. However, there were no significant differences in the skip index. No significant differences were observed in the number of open bolls on five plants per plot. Seed cotton yields varied 392 pounds per acre for the Ridomil G + CGA-279202 (0.04 + 0.156 pound active ingredient per acre) and the Delta Coat AD treatments, respectively. The average yield of seed cotton from the fungicide-treated plots was not greater than the yield of the untreated control.

Cotton seedling disease incidence was moderate and a severe drought reduced yields at the Prattville Experiment Field in central Alabama. Significant differences in seedling stand were observed at four and six weeks after planting (Table 2). At four weeks after planting, eight of the fungicide treatments produced significantly greater stand than the untreated control. However, no treatment produced a significantly lower skip index compared

TABLE 1. EFFICACY OF EXPERIMENTAL IN-FURROW FUNGICIDE COMBINATIONS ON SUREGROW 125B/RR COTTON SEEDLING DISEASE AT TENNESSEE VALLEY RESEARCH AND EXTENSION CENTER

Treatment and rate formulated product	Application treatment	Stand[1] May 2	Stand[1] May 17	Stand[1] May 31	Skip index[2] May 31	Seed cotton *lbs/ac* Sept. 19
Untreated Control		58	99	101	0.2	3894
Terraclor Super X 1.85 oz ai/1000 ft row	In furrow	56	99	105	0.5	3868
Quadris 2SC 8.35 fl oz/ac	In furrow	65	93	102	0.3	3816
Quadris 2SC 5.56 fl oz/ac	In furrow	59	94	101	0.2	3711
Ridomil Gold + Terraclor 4F 0.075 fl + 7.4 fl oz/1000f row	In furrow	58	104	108	0.5	4025
Ridomil Gold 0.075 fl oz/1000 ft row	In furrow	59	99	102	0.3	3711
Delta Coat AD 11.75 oz/cwt	Seed	55	89	94	0.0	3685
Ridomil G + PCNB 0.040 lb ai/ac + 1.0 lb ai/ac	In furrow	60	106	110	0.3	3868
Ridomil G + CGA-279202 0.040 lb ai/ac + 0.125 lb ai/ac	In furrow	66	106	107	0.0	3868
Ridomil G + CGA-279202 0.040 lb ai/ac + 0.156 lb ai/ac	In furrow	58	97	104	0.2	4077
Ridomil G + Rovral 4F 0.040 lb ai/ac + 0.156 lb ai/ac	In furrow	58	99	108	0.3	3868
LSD (0.05)		**16**	**12**	**13**	**0.6**	**279**

[1] Number of live seedlings per 25 feet of row; all rows received 125 seed of SureGrow 125 B/RR.
[2] Skip index ratings based on 25 feet of row. Ratings correspond to distance of skipped plants; for example: 1 = 1-foot gap; 2 = 2-foot gap; and so on to 25 = no plants.Means compared using Fisher's protected least significant difference test (P=0.05).

TABLE 2. EFFICACY OF EXPERIMENTAL IN-FURROW FUNGICIDE COMBINATIONS ON DPL NUCOTN 35B COTTON SEEDLING DISEASE AT PRATTVILLE EXPERIMENT FIELD

Treatment and rate formulated product	Application treatment	Stand[1] April 25	Stand[1] May 10	Stand[1] May 24	Skip index[2] May 24	Seed cotton *lbs/ac* Aug. 31
Untreated control	—	110	91	96	2.8	1629
Terraclor Super X EC 1.85 oz ai/1000 ft	In furrow	118	106	107	1.5	1544
Quadris 2SC 8.35 fl oz/ac	In furrow	108	92	100	2.7	1662
Quadris 2SC 5.56 fl oz/ac	In furrow	112	96	96	2.0	1549
Ridomil Gold + 0.075 fl oz/1000 ft row + Terraclor 2E 7.4 fl oz/1000 ft row	In furrow	113	100	95	2.3	1568
Ridomil Gold 0.075 fl oz/1000 ft	In furrow	115	95	96	2.0	1556
Delta Coat AD 11.75 oz/cwt.	Seed	106	95	93	2.7	1573
Ridomil Gold .040 lb ai/ac + PCNB 1.0 lb ai/ac	In furrow	117	98	100	2.3	1573
Ridomil Gold 0.040 lb ai/ac + CGA-279202 0.125 lb ai/ac	In furrow	105	94	100	2.0	1585
Ridomil Gold 0.040 lb ai/ac + CGA-279202 0.156 lb ai/ac	In furrow	109	95	92	2.3	1496
Ridomil Gold 0.040 lb ai/ac + Rovral 0.156 lb ai/ac	In furrow	114	91	94	2.7	1625
LSD (0.05)		**20**	**13**	**12**	**1.5**	**196**

[1] Number of live seedlings per 30 feet of row; all rows received 150 seed of DPL NuCotn 35B.
[2] Skip index ratings based on 25 feet of row. Ratings correspond to distance of skipped plants; for example: 1 = 1-foot gap; 2 = 2-foot gap; and so on to 25 = no plants.Means compared using Fisher's protected least significant difference test (P=0.05).

to the control, indicating a more evenly spaced seedling stand at six weeks after planting. Seed cotton yields varied 166 pounds per acre in the Quadris 2SC 8.35 fluid ounces per acre and the Ridomil G + CGA 0.156 pound active ingredient per acre treatments, respectively. The average yield of seed cotton from the ten fungicide-treated plots was not greater than the yield of the untreated control.

EVALUATION OF EXPERIMENTAL IN-FURROW FUNGICIDES FOR CONTROL OF SEEDLING DISEASE OF COTTON

Kathy S. McLean, H. L. Campbell, Aaron Palmateer, Bobby E. Norris, and Don P. Moore

The objective of this research was to evaluate experimental in-furrow fungicide combinations for control of seedling disease of cotton. This cotton fungicide test was planted at Tennessee Valley Research and Extension Center in Belle Mina and Prattville Experiment Field in Prattville. These fields have a history of cotton seedling disease. Fungicides were applied as a seed treatment or as an in-furrow spray or granular application at planting. All in-furrow fungicide sprays were applied with flat tip 8002E nozzles calibrated to deliver 20 GPA at 30 PSI. In-furrow granular applications were applied with chemical granular applicators attached to the planter.

Plots were infested with millet seed inoculated with *Pythium* spp. and *Rhizoctonia solani*. Plots consisted of two rows, 25 to 30 feet long with 36 inch wide row spacing. Plots were arranged in a randomized complete block design with six replications. 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, skip index, and vigor ratings were recorded at two, four, and six weeks after planting to determine the percent seedling loss, stand density, and seedling vigor due to cotton seedling disease. Plots were harvested and data recorded.

Cotton seedling disease incidence was moderate Tennessee Valley Research and Extension Center. Significant differences in seedling stand were observed at two, four, and six weeks after planting (Table 1). Ridomil G + CGA-279202 produced the greatest stand at two weeks after planting. At four and six weeks Ridomil Gold + Terraclor 4 F, Ridomil G + PCNB, and Ridomil G + CGA-279202 produced significantly greater stands than the untreated control. Ridomil G + PCNB and Ridomil G + CGA-279202 also produced a significantly lower skip index, indicating a more evenly spaced seedling stand than the control at six weeks after planting. However, four weeks after planting only Vitavax-PCNB + Allegiance FL (6.0 +0.75 fluid ounces per hundred weight) produced a significantly lower skip index. No significant differences were observed in the number of open bolls on five plants per plot. Seed cotton yields varied 496 pounds per acre for the Ridomil Gold + Terraclor 4 F and the untreated control, respectively. Ridomil Gold + Terraclor 4 F and Ridomil G + PCNB significantly increased the yields over the control. The average yield of seed cotton from the fungicide-treated plots was 241.8 pounds greater than the yield of the untreated control.

Cotton seedling disease incidence and severity was moderate and a severe drought affected yields at the Prattville Experiment Field. Significant differences in seedling stand were observed at four and six weeks after planting (Table 2). At four weeks after planting, Terraclor Super X 2EC and Quardis 2SC treatments produced significantly greater stands than the untreated control. At six weeks after planting, eight of the ten fungicide treatments

TABLE 1. EFFICACY OF EXPERIMENTAL IN-FURROW FUNGICIDE COMBINATIONS ON SUREGROW 125B/RR COTTON SEEDLING DISEASE AT TENNESSEE VALLEY RESEARCH AND EXTENSION CENTER

Treatment and rate formulated product	Application treatment	Stand[1] May 2	Stand[1] May 17	Stand[1] May 31	Skip index[2] May 31	Seed cotton *lbs/ac* Sept. 19
Untreated control	—	29	52	50	7.2	3084
Terraclor Super X 1.85 oz ai/1000 ft row	In furrow	33	63	60	6.1	3398
Quadris 2SC 8.35 fl oz/ac	In furrow	30	60	56	5.8	3136
Quadris2SC 5.56 fl oz/ac	In furrow	28	57	53	6.4	3215
Ridomil Gold + Terraclor 0.075 fl + 7.4 fl oz/1000 ft row	In furrow	29	69	66	4.8	3581
Ridomil Gold EC 0.075 fl oz/1000 ft row	In furrow	31	65	59	6.0	3267
Delta Coat AD 11.75 oz/cwt	Seed	31	69	66	3.4	3398
Ridomil G + PCNB 0.040 lb ai/ac + 1.0 lb ai/ac	In furrow	36	78	75	2.3	3555
Ridomil G + CGA-279202 0.040 lb ai/ac + 0.125 lb ai/ac	In furrow	31	60	59	4.5	3319
Ridomil G + CGA-279202 0.040 lb ai/ac + 0.156 lb ai/ac	In furrow	38	69	67	3.3	3372
Ridomil G + Rovral 0.040 lb ai/ac + 0.156 lb ai/ac	In furrow	23	56	53	7.6	3110
LSD (0.05)		**10**	**13**	**12**	**2.9**	**382**

[1] Number of live seedlings per 25 feet of row; all rows received 125 seed of SureGrow 125 B/RR.
[2] Skip index ratings based on 25 feet of row. Ratings correspond to distance of skipped plants; for example: 1 = 1-foot gap; 2 = 2-foot gap; and so on to 25 = no plants. Means compared using Fisher's protected least significant difference test (P=0.05).

Table 2. Efficacy of Experimental In-furrow Fungicide Combinations on SureGrow 125 B/RR Cotton Seedling Disease at Prattville Experiment Field

Treatment and rate formulated product	Application treatment	Stand[1] April 25	Stand[1] May 10	Stand[1] May 24	Skip index[2] May 24	Seed cotton *lbs/ac* Aug. 31
Untreated control	—	72	68	67	7.5	1428
Terraclor Super X 1.85 oz ai/1000 ft row	In furrow	81	86	87	3.3	1440
Quadris 2SC 8.35 fl oz/ac	In furrow	83	81	87	3.5	1492
Quadris2SC 5.56 fl oz/ac	In furrow	81	81	81	5.5	1392
Ridomil Gold + Terraclor 1.0 fl + 7.4 fl oz/1000 ft row	In furrow	79	76	77	5.7	1476
Ridomil Gold EC 0.075 fl oz/1000 ft row	In furrow	77	75	76	6.3	1412
Delta Coat AD 11.75 oz/cwt	Seed	81	79	80	3.5	1568
Ridomil G + PCNB 0.040 lb ai/ac + 1.0 lb ai/ac	In furrow	74	72	73	5.2	1488
Ridomil G + CGA-279202 0.040 lb ai/ac + 0.125 lb ai/ac	In furrow	72	66	57	9.3	1533
Ridomil G + CGA-279202 0.040 lb ai/ac + 0.156 lb ai/ac	In furrow	77	72	72	8.0	1295
Ridomil G + Rovral 0.040 lb ai/ac + 0.156 lb ai/ac	In furrow	74	69	69	7.2	1335
LSD (0.05)		**15**	**14**	**12**	**4.3**	**213**

[1] Number of live seedlings per 30 feet of row; all rows received 150 seed of DPL NuCotn 35B.
[2] Skip index ratings based on 25 feet of row. Ratings correspond to distance of skipped plants; for example: 1 = 1-foot gap; 2 = 2-foot gap; and so on to 25 = no plants. Means compared using Fisher's protected least significant difference test (P=0.05).

significantly improved stands compared to the untreated control. However, no treatment produced a significantly lower skip index, indicating a more evenly spaced seedling stand compared to the control at six weeks after planting. Seed cotton yields varied 274 pounds per acre in the Delta Coat AD and the Ridomil Gold + PCNB treatments, respectively.The average yield of seed cotton from the ten fungicide-treated plots was 151 pounds greater than the yield of the untreated control.

Evaluation of Selected Fungicides for Control of Seedling Disease in Ultra Narrow Row Cotton

Kathy S. McLean, H. L. Campbell, Aaron Palmateer, C. Dale Monks, and Dennis P. Delaney

The objective of this research was to evaluate in-furrow fungicides for control of seedling disease of cotton in an Ultra Narrow Row management scheme. A cotton fungicide test was planted April 20 at the Auburn University, E. V. Smith Research Center, in Shorter, Alabama.

Fungicides were applied either as seed treatments, in-furrow granules, or as a broadcast spray. Fungicides applied as a broadcast spray were applied immediately before planting utilizing a backpack CO_2-charged six foot boom with flat fan tip 8002E nozzles calibrated to deliver 10 gallons per acre at 30 pounds per square inch. In-furrow granular treatments were applied with the seed at planting. DP 458 B/RR was planted in all plots at a rate of 180,000 seed per acre with a cone type drill.

Plots consisted of 18 rows, 25 feet long with a 7-inch wide row spacing and were arranged in a randomized complete block design with six replications. Blocks were separated by a 20-foot alley. All plots were maintained throughout the season with standard herbicide, insecticide, and fertility production practices as recommended by the Alabama Cooperative Extension System. Stand counts, skip index, and vigor ratings were recorded at two, four, and six weeks after planting to determine the percent seedling loss, stand density, and seedling vigor due to cotton seedling disease. The number of open and closed bolls were counted on August 30 to indicate relative plant maturity. The center 7 feet of each plot was harvested on September 19 with a finger stripper.

Cotton seedling disease incidence was moderate. Significant differences in seedling stand were observed. At two and four weeks after planting, all fungicide treatments increased stand over the control except Ridomil Gold 7 pounds per acre. TSX EC, Rovral 4 F, Ridomil Gold, and Quadris 2SC produced significantly more uniform stands than the control at six weeks after planting. No significant differences were observed in the percent of open bolls. Seed cotton yields varied 214 pounds per acre for the Delta Coat AD and the TSX EC treatments, respectively, with no significant differences between any treatments. When the seed cotton yields of the fungicide treatments were averaged they were not greater than the untreated control.

Efficacy of Experimental In-furrow Fungicide on DP 458B/RR Seedling Disease in Ultra Narrow Row Cotton

Treatment and rate formulated product	Application treatment	Stand[1]			Skip index[2]	Open bolls %	Seed cotton *lbs/ac*
		April 25	May 10	May 23	May 23	Aug. 9	Aug. 24
Untreated control		34	36	42	17.2	45	2020
TSX 18.8G 5.5 lb/ac	In-furrow	45	45	43	16.7	55	1906
TSX EC 48 fl oz/ac	Broadcast	43	42	41	14.8	46	2089
Rovral 4CF 5.2 fl oz/ac	Broadcast	43	46	43	12.2	50	2016
Ridomil Gold 7 lb/ac	In-furrow	34	36	42	16.0	49	2090
Ridomil Gold 0.1 fl oz/1000 row ft	Broadcast	46	46	43	14.7	46	1917
Quadris 2.08 SC 6.0 fl oz/ac	Broadcast	43	44	42	15.8	47	2035
Delta Coat AD 11.75 fl oz/cwt	Seed	45	44	41	17.2	55	1875
LSD (0.05)		**7**	**8**	**6**	**4.2**	**16**	**286**

[1] Number of live seedlings per 25 feet of row; all rows received 150 seed of DP 458B/RR.
[2] Skip index ratings based on 25 feet of row. Ratings correspond to distance of skipped plants; for example: 1 = 1-foot gap; 2 = 2-foot gap; and so on to 25 = no plants. Means compared using Fisher's protected least significant difference test (P=0.05).

GROWTH REGULATORS

DIMILIN AND BORON EFFECTS ON COTTON AT E. V. SMITH

Dennis P. Delaney, C. Dale Monks, and Bobby Durbin

For a number of years, Dimilin® and boron foliar sprays have been recommended in some states to control insects and promote fruit set in soybeans. This study is intended to investigate whether these treatments may also be of value to cotton producers. Several timings and combinations of Dimilin and boron (Solubor) sprays were applied to Deltapine NuCotn 33B at the E. V. Smith Research Center, Field Crops Unit.

BORON AND DIMILIN AS GROWTH REGULATORS FOR BT COTTON

Treatment	Lint yield *lbs/ac*	Height *cm*	Nodes *total*
Dimilin 2 oz*4 times, PHS	1189	63	24.9
Dimilin 4 oz*4 times, PHS	1091	60	23.8
Dimilin 4 oz*2 times, FB	1182	59	24.4
Dimilin + Solubor (4 oz + 1.25 lb)*2 times, FB	1150	60	24.1
Solubor FB	1136	57	23.7
Untreated	1130	61	25.2
LSD (0.10)	**70**	**5**	**1.4**

PHS=Pinhead square; FB=Full bloom.
Means followed by same letter do not significantly differ (P=.10, LSD)

The experimental design was a randomized complete block with six replications. Plots consisted of four bedded 40 inch rows, 30 feet long. Treatments were Dimilin at 2 or 4 fluid ounces per acre applied starting at pinhead square and repeated four times on a two week schedule; or sprays starting at full bloom and repeated in 14 days of 4 ounces per acre Dimilin, 1.25 pounds per acre Solubor, or 4 ounces per acre Dimilin + 1.25 pounds per acre Solubor. All four rows of each treatment were sprayed with a small plot tractor at 21 gallons per acre or a backpack CO_2 sprayer at 15 gallons per acre. A total of 7.45 inches of irrigation was applied. One broadcast application of Pix at 8 ounces per acre was made at the early bloom stage.

Measurements were made of total plant height, plant mapping for retention and nodes, and percent open bolls. The center two rows of each plot were harvested with a spindle picker, weighed, and a composite sample ginned for lint yields.

Several measurements were slightly affected by application of Dimilin and/or boron. Lint yield was slightly increased by 4 ounces per acre of Dimilin applied twice starting at full bloom, vs four applications starting at Pinhead square, while total nodes were decreased compared to the untreated check. Height was slightly decreased by Solubor alone vs Dimilin at 2 ounces per acre four times. Most of these differences were barely above the LSD, and cannot be easily explained.

GROWTH REGULATOR EFFECTS ON COTTON

Dennis P. Delaney, C. Dale Monks, Bobby Durbin, and James Bannon

Growth regulators are often used in cotton to control vegetative growth and encourage early fruit set. Each year, trials are conducted to compare established products with new products that are, or soon will be, available to producers. A study was conducted at the E. V. Smith Research Center, Field Crops Unit, to compare Pix®, Pix Plus®, and Pix Ultra® to an untreated check treatment.

Deltapine NuCotn 33B was planted on 23 May, 2000 in bedded, 40-inch rows. Recommended fertility, weed control, and insect control measures were followed. Plots were irrigated with lateral move system for a total of 7.45 inches during an extremely dry season.

The experimental design was a randomized complete block with six replications. Plots were four rows wide and 30 feet long. Treatments were applied using a small plot tractor (21 gallons per acre) or backpack sprayer (15 gallons per acre) at 30 pounds per square inch to all four rows. The first application was at the pinhead square stage with the second applied 14 days later. All treatments were applied at 8 fluid ounces per acre of formulated product, with Activate Plus® added to each treatment.

Data were taken on height from cotyledon to terminal and position 1 fruit retention. The center two rows were harvested with a spindle picker and weighed, and a composite sample ginned for lint yield calculations.

Due to the extremely dry weather and heat stress this season, few differences were noted (see table.)

GROWTH REGULATOR EFFECTS ON COTTON

Treatment	Height Aug. 29 *cm*	Fruit retention[1] Aug. 29 *%*	Open bolls Oct. 2 *%*	Lint yield Nov. 6 *lbs/ac*
Untreated check	67	76	76	1026
Pix Plus	49	80	61	957
Pix Ultra	57	81	58	1056
Pix	49	86	64	1015
LSD (0.10)[2]	**4**	**7**	**10**	**NS**

[1] Indicates first position fruit retention.
[2] Means followed by same letter do not significantly differ (P=.10, LSD)

AUTHORS' INDEX