

**REPORT OF THE SOILBORNE PATHOGEN  
COMMITTEE-1996  
G.L. Sciumbato, Chairman  
Plant Pathologist, Mississippi State University  
Delta Research and Extension Center  
Stoneville, MS**

Alabama. W. S. Gazaway and Dale Monks, Extension Plant Pathology and Agronomy, Auburn University, AL. Two separate soil fungicide tests studying the effect of in-furrow fungicide soil treatments versus hopper box treatments applied in early April and in early May were compared. Early planted cotton (early April) produced significantly better yields than the later planted cotton (early May); but there were no differences between treatments (Ridomil PC, Terraclor Super X, DeltaCoat, or Prevail) and the untreated check at either planting date.

Louisiana. P. D. Colyer and P. R. Vernon, Louisiana State University Agricultural Center. Two trials were conducted at the Red River Research Station in Bossier City to evaluate the efficacy of soil applied fungicides for the control of cotton seedling diseases. Experimental design of the trials was a randomized complete block with four replications. Plots were four rows on 40-inch centers by 100 ft long. Granular formulations were applied through applicator boxes mounted on a John Deere 7100 planter. Liquid formulations were applied with a single 8503 spray tip over the open furrow using a pressurized CO<sub>2</sub> applicator calibrated to deliver 7 gal/A. During planting, the two center rows were inoculated with *Rhizoctonia solani* and *Pythium* spp. infested millet seed to increase seedling disease pressure. Both trials were planted on May 2 and harvested on October 28. All plant population and yield data were collected from the two center rows.

In the first trial, the efficacy of Terraclor Super X 18.8G was compared with Start 15G (Table 1). All of the treatments, except Start 15G at 3.0 lb and 4.0 lb/A, produced higher plant populations at two and six weeks after planting than the untreated control. Most of the fungicides performed better than Start 15G at 3.0 and 4.0 lb/A. Although there were some differences in seed cotton yield, none of the treatments produced significantly higher yield than the untreated control.

In the second trial, the efficacy of Terraclor 2E was compared with Rovral 50WG (Table 2). All of the treatments, except Rovral 50WG at 3.25 oz/A, produced higher plant populations at two and six weeks after planting than the untreated control. Terraclor 2E produced higher plant populations than Rovral 50WG. All of the fungicide treatments produced higher seed cotton yield than the untreated control.

Mississippi. G. L. Sciumbato - (Evaluation of In-Furrow Fungicides). In-furrow fungicide combinations were evaluated in a test at the Mississippi Delta Research and Extension Center, Stoneville, MS. Deltapine 50 cottonseed, treated with the recommended fungicides, was planted on April 26. The experimental design was randomized complete block with four replications. Plots were 2 rows, 40 feet long each. Thirty milliliters per 40 row foot of a 1:1 mixture of *Rhizoctonia solani* and *Pythium* spp. infested oats were applied in-furrow by means of belt cones, just prior to planting. Hopper-box treatments were applied by atomizing chemicals onto seed while being tumbled by means of a seed treater. The liquid in-furrow treatments were applied by means of TX-4 nozzle tips using 46 psi of compressed air at 5 gpa at planting and the granular treatments were applied at planting through cone planters mounted on the tractor. Two stand counts of the entire plot were taken, one on May 30 and the other on June 12. Plots were harvested on October 15 with a two row picker modified for plot harvesting. All treatments significantly improved stand counts on both dates over the untreated check (Table 3). Rovral 50 WG at 6.5 oz/A + Terrazole 4 EC at 8 oz/A, Rovral 4 F at 6.3 oz/A and Terraclor Super X 18.8 G at 6.65 lbs/A significantly increased yield in lbs of seed cotton per acre over the untreated check.

Mississippi. G. L. Sciumbato - (Evaluation of Granular In-Furrow Fungicides). A trial was conducted at the Mississippi Delta Research and Extension Center, Stoneville MS, to evaluate granular, in-furrow fungicides. On April 25, Deltapine 50 cottonseed, treated with the recommended fungicides, was planted. Plots were 2 rows, 40 feet long each. The experimental design was a randomized complete block with four replications. Thirty milliliters per 40 row feet of a 1:1 mixture of *Rhizoctonia solani* and *Pythium* spp. infested oats were applied in-furrow by means of belt cones. Both hopper-box and seed treatments were applied by atomizing treatments onto seed while being tumbled by means of a seed treater. Granules were applied in-furrow by means of a belt cone planter mounted on a John Deere 7100 planter and the liquid fungicides were applied by means of TX 4 nozzle tips using 46 psi of compressed air, 5 gpa in-furrow at planting. On May 15 and May 31 stand counts were taken. Plots were harvested on October 15 with a two row picker modified for plot harvesting.

Several of the treatments (Table 4) significantly increased percent stands over the untreated control on both counting dates. Plots treated with TSX 18.8 G, 5.5 lb/A; Terraclor 10 G, 7 lb/A + Apron 2 EC, 2 oz/A; and Ridomil Gold PC 10.5 G, 7 lb/A had significantly higher yields over the untreated check.

Mississippi. W. E. Batson, Jr. and J. C. Caceres - (Comparisons of Rovral and Terraclor in combination with Ridomil and Terrazole for control of the cotton seedling disease complex). A trial was conducted at the Plant

Sciences Research Center at Mississippi State University to evaluate selected combinations of fungicides applied in-furrow for control of the cotton seedling disease complex. Eight in-furrow treatments were compared to a no in-furrow treatment control. Experimental design was a randomized complete block with four replications. Plots were four rows by 40 feet and were artificially infested with *Rhizoctonia* and *Pythium*. Cotton isolates of *R. solani* and *P. ultimum* were grown on winter rye seed, seed were ground in a mill, and inoculum dispensed with Kincaid Belt-Seed cones at the rate of 2 and 1 gram per 40 row feet, respectively. One hundred twenty seed (Deltapine 50, commercially treated with Baytan/Thiram + Apron + Kodiak + Epic) were planted per 40 row feet with a Case-IH model 800 Early Riser planter equipped with Kincaid seed cones. Fungicides were applied at a rate of 5 GPA through a single TX 6 Teejet nozzle over the open furrow with compressed air at 18 psi. Plots were planted on April 17, 1996, and soil temperature was 68 F at seed depth.

All in-furrow treatment combinations except Rovral at 6.88 oz/A and Ridomil at 8.25 oz/A significantly increased seedling survival over that of the no in-furrow control (see Table 5). There was a significant increase in seedling survival when in-furrow combinations of Terraclor and Ridomil very compared to Rovral - Ridomil combinations. Seedling survival from combinations of Rovral and Terrazole and Terraclor and Terrazole were not significantly different. There was no significant treatment affect on yield.

Mississippi - W. E. Batson, Jr. and J. C. Caceres - (Efficacy of selected in-furrow and hopper-box fungicides on cotton seedling disease control). Terraclor Super X EC and Prevail HB were each evaluated at two rates for cotton seedling disease control in stale bed and conventional tillage systems. In the stale bed system, cotton stalks were cut, rows ripped and hipped in the Fall, overwintering vegetation burned down in the Spring and do-alled prior to planting. In the conventional system, rows were rehipped after burndown. Plots were eight rows wide with tillage systems stripped through the field in four row patterns. The first two rows of each four row set were inoculated with *Rhizoctonia solani* and *Pythium ultimum* grown on winter rye seed. Fungicide treatments consisted of a black seed check, commercially treated seed (CTS), and CTS plus TSX at 2 or 3 qts/A in-furrow and Prevail HB at 8 or 16 oz/cwt. The experiment had five replications.

Analysis of data indicated that there was no significant influence of tillage system on final stands of cotton in this test; however, there was an inoculum by treatment interaction. In plots artificially inoculated with *R. solani* and *P. ultimum* all plots in which commercially treated seed were used had significantly higher numbers of plants than in the black seed check (see Table 6). The addition of TSX EC in-furrow at 2 qts/A or Prevail HB at 16 oz/cwt to CTS led to significant increases in final stand. The addition of

TSX at 3 qts/A to CTS did not lead to an increase in stand over that of CTS alone. Stands were significantly reduced when the low rate of Prevail was added to the CTS. In noninoculated plots, stands were also significantly increased when TSX at 2 qts/A or Prevail HB at 16 oz/cwt were added to CTS (see Table 7). However, the black seed check and CTS plus the high rate of TSX were not significantly different from the CTS treatment alone. Again, stands were significantly reduced when the low rate of Prevail was added to CTS.

Tennessee. A. Y. Chambers, University of Tennessee, West Tennessee Experiment Station, Jackson, TN. (Seedling Disease Control with Soil Fungicides in No-Till and Conventional-Tillage Cotton). Three granular in-furrow soil fungicide treatments, one seed-overcoat fungicide treatment, and three in-furrow spray soil fungicide treatments were evaluated in 1996 for control of cotton seedling diseases. A split-plot no-till and conventional-tillage experiment was located on an upland silt loam soil at the University of Tennessee Milan Agricultural Experiment Station at Milan. Plots were planted April 25 using the same four-row, no-till planter without change for both types of plantings. Deltapine 20 seed (acid-delinted and commercially-treated with Baytan, Thiram, Apron, Kodiak, Epic, and Lorsban) were planted in cotton stubble remaining from the 1995 crop for no-till planting and in a well-prepared seedbed for conventional planting. Seed-overcoat treatment was applied with a seed treater April 21. The treatments were Terraclor Super X 18.8G, 5.33 lb/A; Ridomil PC 11G, 8 lb/A; Start 15G, 4 lb/A; Delta-Coat AD, 11.75 fl oz/cwt seed; Terraclor Super X 2.5EC, 2qt/A; Terraclor 2EC, 2qt/A + Ridomil 2E, 4 fl oz/A; and Rovral 50WG, 0.4 lb/A + Ridomil 2E, 8 fl oz/A. Temik 15G, 3.5 lb/A, was applied with all treatments. Untreated plots also receiving Temik were included in both tillages. In-furrow granular fungicide and insecticide treatments were made from partitioned granular hopper.

All treatments significantly increased stand counts over those in untreated plots of conventional tillage. Stands were not improved significantly in no-till plots receiving Delta-Coat; other treatments increased stands. Number and length of skips were reduced significantly in plots of both tillages receiving all treatments. Plant vigor was significantly improved in plots of all fungicide treatments compared to no treatment in both tillages. Early-season insect injury was relatively low in all plots, and no early insecticide sprays were applied until over seven weeks after planting. Yields were increased significantly in no-till plots treated with Terraclor Super X and Rovral + Ridomil in-furrow sprays (107 lb lint/A). Yields were not improved by any of the fungicide treatments in conventional-tillage plots.

Seedling disease severity was greater in no-till than in conventional-tillage plots in 1996. Yields in no-till and conventionally-tilled plots were not significantly different in 1996 with a difference of only 30 lb lint/A in favor of no-

till across all treatments. It appears that a cotton grower can probably expect to get similar yields with no-till compared to conventional-tillage in some years and higher or lower in others that would probably average out over several years. Soil fungicides were not as critical for seedling disease control in both tillages in 1996 since weather conditions were dry and warm at time of planting and for a week or so after planting.

Table 1. Comparison of Terraclor Super X 18.8G and Start 15G In-Furrow Fungicides for Cotton Seedling Disease Control, Red River Research Station, Bossier City, LA, 1996.

Treatments <sup>1</sup>	Rate (prod/a)	Plant Population <sup>2</sup>		Seed Cotton (lbs/a)
		2 wks	6 wks	
Untreated	---	181 b	174 c	1090 ab
Start 15G	6.0 lb	283 a	297 ab	1224 a
Start 15G	4.0 lb	192 b	231 bc	1186 ab
Start 15G	3.0 lb	88 c	140 c	900 b
Ridomil-PC 11G	7.0 lb	320 a	337 ab	1291 a
Terraclor Super X 18.8G	6.0 lb	332 a	342 a	1178 ab
Terraclor Super X 18.8G	5.5 lb	301 a	317 ab	1342 a

<sup>1</sup> Means followed by the same letter are not significantly different according to Duncan's Multiple Range Test (P=0.05).

<sup>2</sup> Plant populations per 100 row feet.

Table 2. Comparison of Terraclor 2E and Rovral 50 WG In-Furrow Fungicides for Cotton Seedling Disease Control, Red River Research Station, Bossier City, LA, 1996.

Treatment <sup>1</sup>	Rate (prod/a)	Plant Population <sup>2</sup>		Seed Cotton (lb/a)
		2 wk	6 wk	
Untreated	---	120 c	55 c	1020 b
Terraclor 2E	48 oz	276 a	231 a	1802 a
Terraclor 2E	64 oz	277 a	254 a	1657 a
Rovral 50WG	3.25 oz	148 c	123 bc	1582 a
Rovral 50WG	6.5 oz	205 b	149 b	1657 a

<sup>1</sup> Means followed by the same letter are not significantly different according to Duncan's Multiple Range Test (P=0.05).

<sup>2</sup> Plant populations per 100 row feet.

Table 3. 1996 Cotton Fungicide Trial One. Oat Inoculum. MAFES, Delta Research and Extension Center, Stoneville, MS<sup>1</sup>.

Treatment, Formulation, and Rate per Acre	% Seedling Survival		Yield in lb seed cotton/A
	5/30	6/12	
Untreated . . .	23.8 d <sup>2</sup>	23.3 d	2062 d <sup>3</sup>
TSX 2.5 EC 3 pt . .	36.5 b-d	36.0 bc	2588 a-d
Terraclor 2 EC 3 pt	42.8 b	42.3 ab	2494 a-d
Terraclor 2 EC 3 pt + Ridomil 2 EC 4 fl oz . . . .	39.1 bc	37.7 bc	2617 a-d
Rovral 4 F 6.3 fl oz + Terrazole 4 EC 8 fl oz . . .	27.7 cd	26.4 cd	2298 b-d
Rovral 50 WG 6.5 oz + Terrazole 4 EC 8 fl oz . . .	43.3 b	41.8 a-c	2772 a-c
Rovral 50 WG 6.5 oz + Terrazole 35 WP . .	43.3 b	41.0 a-c	2715 a-d
Rovral 50 WG 6.5 oz + Ridomil 2 EC 4 fl oz . . . .	39.4 bc	37.6 b-c	2605 a-d
Rovral 50 WG 6.5 oz . . .	40.5 bc	38.3 b-c	2503 a-d
Rovral 4 F 6.3 fl oz	45.9 ab	44.2 ab	2996 ab
ICI 5504 80 WG .2 lb + Ridomil 2 EC 4 fl oz . . . .	39.6 bc	34.4 b-c	2539 a-d
RH 130753 50 WP .56 lb + Ridomil 2 EC 4 fl oz . . . .	43.4 b	41.0 a-c	2617 a-d
Start 60 WG 7.31 oz . . .	38.8 bc	37.8 b-c	2229 dc
Terraclor Super X 18.8 G 6.65 lb	59.4 a	56.6 a	2997 a
M.S.D.	14.7	15.5	686
C.V. . .	23.0	24.2	14
F Value	3.2	2.6	2

<sup>1</sup> Plots were two rows, 40 ft long. Value is percent stand for the two rows (80 ft).

<sup>2</sup> Mean of four replications. Means followed by the same letter are not significantly different according to the Waller-Duncan t-test (K ratio = 100).

<sup>3</sup> Two rows, 40 ft long were harvested on 10/15 with a two row plot picker.

Table 4. 1996 Cotton Fungicide Trial Two. Oat Inoculum. MAFES, Delta Research and Extension Center, Stoneville, MS<sup>1</sup>.

Treatment, Formulation, and Rate per Acre	% Seedling Survival		Yield in lb Seed Cotton/A
	5/14	5/31	
Untreated	34.4 c <sup>2</sup>	24.4 f	2364 d <sup>3</sup>
Start 15 G 6.06 lb	35.1 c	35.1 c-e	2572 b-d
Start 15 G 4.09 lb	37.6 bc	29.6 ef	2437 b-d
Start 15 G 3.06 lb	37.9 bc	33.4 c-f	2756 a-d
TSX 18.8 G 6.0 lb	51.3 a	45.3 ab	2735 a-d
TSX 18.8 G 5.5 lb	55.7 a	50.6 a	2817 ab
Ridomil PC 11 G 7 lb	52.1 a	48.4 ab	2784 a-c
Terraclor 10 G 7 lb + Apron 2 EC 2 oz	47.3 ab	39.7 b-d	3029 a
Rovral 50 WG .4 lb + Apron 2 EC 2 oz	35.5 c	31.7 d-f	2368 d
Rovral 50 WG .4 lb + CGA 329351 4 EC .0625 pt	36.0 c	32.1 d-f	2486 b-d
Ridomil PC Gold 10.5 G 7 lb	52.3 a	50.7 a	2813 a-c
Terraclor 10 G 7 lb + Ridomil 2.5 G 2.5 lb	48.0 ab	42.3 a-c	2568 b-d
Start 15 G 4.09 lb + Ridomil 2.5 G 2.5 lb	38.8 bc	33.5 c-f	2433 cd
Mancozeb 80 WP 2.5 lb	32.9 c	30.9 d-f	2405 cd
M.S.D.	10.8	9.7	411
C.V.	17.5	18.3	9.57
F Value	4.8	6.0	2.8

<sup>1</sup>Plots were two rows, 40 ft long. Value is percent stand for the two rows (80 row ft).

<sup>2</sup>Mean of four replications. Means followed by the same letter are not significantly different according to the Waller-Duncan t-test (K ratio = 100).

<sup>3</sup>Two rows, 40 ft long were harvested on 10\15 with a two row plot picker.

Table 5. Effect of selected in-furrow fungicides on seedling survival and seed cotton yield, Plant Science Research Center, Mississippi State, MS 1996.

Treatment, Formulation and Rate <sup>1</sup>	Surviving Seedlings 05-16-96	Seed Cotton lbs/A
No in-furrow	60.2 e <sup>2</sup>	2530
Rovral WG, 6.88 Ridomil 2 E, 8.25	65.6 de	2746
Terraclor 2 E, 101.9 Ridomil 2E, 8.25	88.2 ab	2591
Rovral WG, 3.44 Ridomil 2E, 4.13	67.8 d	2525
Terraclor 2 E, 50.9 Ridomil 2 E, 4.13	84.3 a	2698
Rovral WG, 6.88 Terrazole 4 E, 12.66	77.2 bc	2517
Terraclor 2 E, 101.9 Terrazole 4 E, 12.66	79.2 abc	2933
Rovral WG, 3.44 Terrazole 4 E, 6.33	72.5 cd	2702
Terraclor 2 E, 50.9 Terrazole 4 E, 6.33	77.1 bc	2714

<sup>1</sup>Oz product/A

<sup>2</sup>Means followed by the same letter are not significantly different according to LSD (0.05).

Table 6. Influence of the addition of an in-furrow or hopper-box fungicide on stand establishment of cotton in plots artificially infested with *Rhizoctonia solani* and *Pythium ultimum*<sup>1</sup>.

Treatment	Mean No. of Plants/40 ft.
Commercial treated seed (CTS)+ TSC EC @ 2 qts/A	93.0 a <sup>2</sup>
CTS + Prevail HB @ 16 oz/cwt	82.7 a
CTS	70.1 b
CTS + TSX EC @ 3qts/A	68.7 b
CTS + Prevail HB @ 8 oz/cwt	54.4 c
Black Seed Check	37.5 d

<sup>1</sup>Data pooled over stale bed and conventional bed systems.

<sup>2</sup>Means not followed by the same letter differ significantly (P=0.05) according to Fishers Protected LSD.

Table 7. Influence of the addition of an in-furrow or hopper-box fungicide on stand establishment of cotton in plots naturally infested with seedling disease pathogens<sup>1</sup>.

Treatment	Mean No. of Plants/40 ft.
Commercial treated seed (CTS) + TSX EC @ 2 qts/A	93.0 a <sup>2</sup>
CTS + Prevail HB @ 16 oz/cwt	96.8 a
CTS	83.9 b
Black Seed Check	79.0 bc
CTS + TSX EC @ 3 qts/A	76.5 bc
CTS + Prevail HB @ 8 oz/cwt	68.5 c

<sup>1</sup>Data pooled over stale bed and conventional bed systems.

<sup>2</sup>Means not followed by the same letter differ significantly (P=0.05) according to Fishers Protection LSD.