

**REPORT OF THE
SOIL FUNGICIDE COMMITTEE - 1999**

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Louisiana. P. D. Colyer and P. R. Vernon, Louisiana State University Agricultural Center. Several cotton in-furrow fungicide trials were conducted at the Red River Research Station in Bossier City, LA, to evaluate the efficacy of soil applied-fungicides for the control of cotton seedling diseases. In several trials there were no significant differences in plant populations among the treatments due to low seedling disease pressure. The results of these trials will not be presented. The results of two trials are presented in Tables 1 and 2. Experimental design in both tests was a randomized complete block with four replications. Plots were four rows by 100 feet on 40-inch centers. Liquid formulations were applied with a single 2503 flat-fan spray tip over the open furrow using a pressurized CO₂ applicator calibrated to deliver 7.5 gpa. All plant populations and yield data were collected from the two center rows.

In the first trial planted on April 12, minimum soil temperatures at four inches were in the upper 60s and lower 70s, and 3.14 inches of rainfall were recorded during the four-week period after planting. Based on plant populations of the untreated control, the incidence of seedling disease in the trial was light (Table 1). There were some differences in plant populations 14 and 42 days after planting, but none of the fungicides had significantly higher plant populations than the untreated control. There were no significant differences in seed cotton yield among treatments.

In the second trial planted on April 30, the center rows were inoculated with *R. solani*-infested millet seed. Minimum soil temperatures at four inches were in the low to mid-70s, and 2.54 inches of rainfall were recorded during the four-week period after planting. Despite the warm temperatures and excellent conditions for seed germination and seedling growth, disease pressure was high due to the application of inoculum (Table 2). All of the fungicide treatments had higher plant populations at 14 and 42 days than the untreated control. There were significant differences among fungicide treatments at 14 days. At 42 days, both formulations of Terraclor (2E and 15G) and Quadris 2.08SC had higher plant populations than Rovral 4F. All of the fungicide treatments had higher seed cotton yields 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. Stoneville 474 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. One hundred milliliters per 40 row foot of a 1:1 mixture of *Rhizoctonia solani* and *Pythium spp.* infested oats and sixty milliliters per 40 row foot of a 1:1 mixture of *Rhizoctonia solani* and *Pythium spp.* infested millet 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 in 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 10 and the other on May 24. Plots were harvested on October 6 with a two row picker modified for plot harvesting. All treatments significantly improved stand counts on both dates over the untreated check in the plots inoculated with *Rhizoctonia solani* and *Pythium spp.* on millet (Table 3) but there was no significant differences in the plots inoculated with *Rhizoctonia solani* and *Pythium spp.* on oats (Table 4). All treatments except Prevail, 12 fl oz/CWT, Amvac PCNB, 20G, 5 lb/A, and Terraclor, 5 lb/A significantly increased seed cotton yield in the plots inoculated with *Rhizoctonia solani* and *Pythium spp.* on millet (Table 3), but there was no significant difference in yield in the oat plots (Table 4).

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. Stoneville 474 cottonseed, treated with the recommended fungicides, was planted on April 29. The experimental design was randomized complete block with four replications. Plots were 4 rows, 40 feet long each. One hundred milliliters per 40 row foot of a 1:1 mixture of *Rhizoctonia solani* and *Pythium spp.* infested oats were applied in planters 1 and 2, in-furrow by means of belt cones and sixty milliliters per 40 row foot of a 1:1 mixture of *Rhizoctonia solani* and *Pythium spp.* infested millet were applied in planters 3 and 4, in-furrow by means of belt cones, just prior to planting. Hopper-box treatments were applied by atomizing chemicals onto seed while being tumbled in 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 13 and the other on May 28. Plots were harvested on October 6 with a two row picker modified for plot harvesting. There were no significant differences between any of the treatments and the

untreated check in percent seedling survival or yield in the plots inoculated with *Rhizoctonia solani* and *Pythium spp.* on millet (Table 5). In the plots inoculated with *Rhizoctonia solani* and *Pythium spp.* on oats Rovral 4F, 3.3 fl oz/A + Ridomil Gold 4F, 1.25 fl oz/A; Flint EC, 15.5 fl oz/A + Ridomil Gold 4F, 1.25 fl oz/A; AMVAC PCNB 2E, 64 fl oz/A + Ridomil Gold 4F, 1.25 fl oz/A; and AMVAC PCNB 2E, 64 fl oz/A all had stand counts that were significantly higher over the untreated check on the first rating date but not on the second rating date and there were no significant yield differences (Table 6).

Tennessee. A. Y. Chambers, University of Tennessee, West Tennessee Experiment Station, Jackson, TN. (Seedling Disease Control with Soil Fungicides in Conventional and No-Tillage Cotton). Seedling diseases were not as severe in Tennessee in 1999 as they have been in some previous years. Losses were estimated at 5 percent compared to 9.5 percent in 1997 and 7 percent in 1998. Weather conditions were not as favorable for seedling disease development in 1999, and there has been a gradual increase in the use of soil fungicides for disease control.

Two granular in-furrow soil fungicide treatments, one seed-overcoat fungicide treatment, and four in-furrow spray soil fungicide treatments were evaluated in 1999 for control of cotton seedling diseases. A split-block conventional-tillage and no-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 22 using the same four-row, no-till planter without change for both types of planting. 'Deltapine 5111' seed (acid-delinted and commercially-treated with Baytan, Thiram, Apron, and Lorsban) were planted into cotton stubble remaining from the 1998 crop for no-till planting and into a well-prepared seedbed for conventional planting. Delta-Coat seed-overcoat treatment was applied with a seed treater April 21. The treatments were Terraclor Super X 18.8G, 5.33 lb/A; Ridomil Gold PC 10.5G, 8 lb/A; Delta-Coat AD, 11.75 fl oz/cwt seed; Terraclor Super X 2.5EC, 2 qt/A; Terraclor 2EC, 2 qt/A + Ridomil Gold PC 4EC, 2 fl oz/A; Rovral CF, 6.53 fl oz/A + Ridomil Gold PC 4EC, 2 fl oz/A; and Rovral CF, 6.53 fl oz/A + Terrazole 4EC, 6 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 hoppers.

All treatments significantly increased stand counts over those in untreated plots of both tillages except Delta-Coat. Number and length of skips were reduced significantly in plots of both tillages receiving all treatments except Delta-Coat. 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 eight weeks after planting. Yields were increased significantly in conventional-tillage plots treated with all treatments except Rovral + Terrazole in-furrow spray. Yields were not improved by any of the fungicide treatments in no-tillage plots. Across tillages, all treatments improved yields significantly except Rovral + Terrazole.

Seedling disease severity was greater in conventional-tillage than in no-till plots in 1999. Yields in no-till and conventionally-tilled plots were significantly different in 1999 with a difference of 327 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 and lower in others that would probably average out over several years.

In a second experiment in 1999 planted in Deltapine 5409 May 3 under no-till conditions at The University of Tennessee West Tennessee Experiment Station at Jackson, eight of 14 soil fungicide treatments improved stands and skip levels significantly over no treatment. Eight treatments included Terraclor Super X 2.5EC, 3 pt/A; Quadris 2.08F, 8.1 fl oz/A; Ridomil Gold PC 10.5G, 8 lb/A; Rovral CF, 6.9 fl oz/A + Terrazole 4EC, 6.3 fl oz/A; Ridomil Gold 4EC, 1 fl oz/A + Rovral CF, 3.45 fl oz/A; Terraclor 2EC, 2 qt/A + Ridomil Gold 4EC, 1 fl oz/A; Rovral CF, 3.45 fl oz/A + Terrazole 4EC, 4.1 fl oz/A; and Terraclor 2EC, 3 pt/A + Ridomil Gold 4EC, 2 fl oz/A. All 14 treatments including treatments above plus Terraclor Super X 18.8G, 5.33 and 6.7 lb/A; Quadris 2.08F, 5.4 fl oz/A; Delta-Coat AD, 11.75 fl oz/cwt seed; Ridomil Gold 4EC, 1 fl oz/A + Rovral CF, 6.9 fl oz/A; and Ridomil Gold 4EC, 2 fl oz/A + Rovral CF, 3.45 fl oz/A significantly increased plant vigor. Only Terraclor Super X 2.5EC, 2 pt/A and Rovral CF, 6.9 fl oz/A + Terrazole 4EC, 6.3 fl oz/A increased total yields significantly over the untreated. The above two treatments plus Terraclor 2EC, 2 qt/A + Ridomil Gold 4EC, 1 fl oz/A and Terraclor 2EC, 3 pt/A + Ridomil Gold 4EC, 2 fl oz/A increased first harvest yield.

Table 1. Effect of standard in-furrow fungicides on plant populations and seed cotton yield, Red River Research Station, Bossier City, LA, 1999.

Treatment	Rate (prod/a)	Plant Populations ¹		Seed Cotton (lb/a)
		21 DAP	42 DAP	
Untreated	-----	241	220	2279
Ridomil Gold 4EC	2.0 oz	244	226	2254
Terrazole 4EC	8.0 oz	251	223	2406
Terraclor 2E	64 oz	198	187	2311
Rovral 4SC	6.5 oz	251	238	2427
Terraclor Super X 2.5EC	64 oz	232	219	2532
Quadris 2.08SC	7.5 oz	252	238	2209
Rovral 4SC + Ridomil Gold 4EC	6.5 oz+2.0 oz	195	182	2168
Rovral 4SC + Terrazole 4EC	6.5 oz+8.0 oz	217	196	2313
Terraclor 2EC + Ridomil Gold 4EC	64oz+2.0 oz	218	195	2078
Quadris 2.08SC + Ridomil Gold 4EC	7.5 oz+2.0 oz	254	239	2313
LSD (P=0.05)		36	36	NS

¹ Plants per 100 row feet; DAP=days after planting.

Table 2. Effect of Terraclor 15G and other in-furrow fungicides on plant populations and seed cotton yield, Red River Research Station, Bossier City, LA.

Treatments	Rate (prod/a)	Plant Populations ¹		Seed Cotton (lb/a)
		14 DAP	42 DAP	
Untreated	-----	41 d ²	31 c	1295 b
Terraclor 2E	48 oz	227 bc	228 a	2383 a
Terraclor 15G	5.0 oz	255 a	246 a	2364 a
Rovral 4F	6.5 oz	203 c	189 b	2231 a
Quadris 2.08SC	7.5 oz	248 ab	253 a	2472 a

¹ Plants per 100 row feet; DAP=days after planting.

² Means followed by the same letter are not significantly different according to Duncan's multiple range test (P≤0.05).

Table 3. 1999 Cotton In-furrow Fungicide Trial One. Inoculated with Millet. MAFES, Delta Research and Extension Center, Stoneville, MS¹.

Treatment and Rate	Percent Seedling Survival ²		Yield in lbs Seed Cotton/A
	May-10	May-24	
No In-furrow Treatment	35.0 e ³	29.6 d	2159.6 c
Terraclor Super X, 7.0 lb/A	60.6 a	58.3 a	2600.6 ab
Prevail, 12 fl oz/CWT	45.6 cd	44.2 c	2486.2 bc
Prevail, 16 fl oz/CWT	49.1 b-d	49.6 bc	2629.1 ab
Amvac PCNB, 10G, 10 lb/A	52.8 bc	50.6 bc	2604.6 ab
Amvac PCNB, 20G, 5 lb/A	43.7 d	43.3 c	2523.0 bc
TSX G/WG 49, 7.4 lb/A	55.6 ab	53.3 ab	2939.4 a
TSX G/WG 49, 5.5 lb/A	52.5 bc	53.1 ab	2788.3 ab
Ridomil Gold PC, 7 lb/A	49.4 b-d	48.1 bc	2592.4 ab
Terraclor, 5 lb/A	47.3 cd	46.3 bc	2547.5 a-c
M.S.D.	7.7	11.2	402.7
C.V.	11	7.5	9.3
F Value	6.7	8.4	2.8

¹This trial was planted April 26. The 1st stand counts were taken May 10 and the 2nd stand counts were taken on May 24. Values are percent seedling survival.

²Inoculated with 60 milliliters of a 1:1 mixture of *Rhizoctonia solani* and *Pythium* sp. on Millet.

³Mean of four replications. Mean followed by the same letter in the same column are not significantly different according to the Waller-Duncan \bar{t} test (K ratio = 100).

Table 4. 1999 Cotton In-furrow Fungicide Trial One. Inoculated with Oats. MAFES, Delta Research and Extension Center, Stoneville, MS¹.

Treatment and Rate	Percent Seedling Survival ²		Yield in lbs Seed Cotton/A
	May-10	May-24	
No In-furrow Treatment	49.0 a ³	47.9 a	2772.0 a-c
Terraclor Super X, 7.0 lb/A	54.4 a	50.9 a	2249.5 d
Prevail, 12 fl oz/CWT	49.4 a	45.2 a	2510.7 cd
Prevail, 16 fl oz/CWT	54.3 a	52.8 a	2653.6 a-c
Amvac PCNB, 10G, 10 lb/A	54.4 a	52.8 a	2706.7 a-c
Amvac PCNB, 20G, 5 lb/A	47.9 a	49.3 a	2592.4 bc
TSX G/WG 49, 7.4 lb/A	54.3 a	52.2 a	2923.1 a
TSX G/WG 49, 5.5 lb/A	49.4 a	48.1 a	2686.3 a-c
Ridomil Gold PC, 7 lb/A	52.5 a	51.1 a	2661.8 a-c
Terraclor, 5 lb/A	50.6 a	48.8 a	2865.9 ab
M.S.D.	7.6	9.4	319.6
C.V.	7.6	8.8	7.6
F Value	1.8	1.3	3.5

¹This trial was planted April 26. The 1st stand counts were taken May 10 and the 2nd stand counts were taken on May 24. Values are percent seedling survival.

²Inoculated with 100 milliliters of a 1:1 mixture of *Rhizoctonia solani* and *Pythium* sp. on Oats.

³Mean of four replications. Mean followed by the same letter in the same column are not significantly different according to the Waller-Duncan \bar{t} test (K ratio = 100).

Table 5. 1999 Cotton In-furrow Fungicide Trial Two. Inoculated with Millet. MAFES, Delta Research and Extension Center, Stoneville, MS¹.

Treatment, formulation, and rate	Percent Seedling Survival ²		Yield in lbs Seed Cotton/A
	May-13	May-28	
No In-furrow Fungicide	31.8 ab ³	33.4 a	1926.9 a
Quadris, 2.01F, 6.5 fl oz/A	38.2 ab	39.8 a	2188.2 a
Rovral, 4F, 3.3 fl oz/A + Ridomil Gold, 4F, 1.25 fl oz/A	41.6 ab	41.4 a	1694.2 a
Rovral, 4F, 6.6 fl oz/A + Ridomil Gold, 4F, 1.25 fl oz/A	29.8 b	31.4 a	2029.0 a
Terraclor Super X, EC, 64 fl oz/A	48.4 a	48.2 a	2245.4 a
Terraclor, EC, 64 fl oz/A + Ridomil Gold, 4F, 1.25 fl oz/A	41.2 ab	43.8 a	2163.7 a
Flint, EC, 15.5 fl oz/A + Ridomil Gold, 4F, 1.25 fl oz/A	37.6 ab	33.5 a	1939.2 a
Amvac PCNB, 2E, 64 fl oz/A + Ridomil Gold, 4F, 1.25 fl oz/A	43.9 ab	53.1 a	2167.8 a
Win-Flo, 4F, 32 fl oz/A + Ridomil Gold, 4F, 1.25 fl oz/A	40.1 ab	43.4 a	2486.2 a
Amvac PCNB, 2E, 64 fl oz/A	33.8 ab	36.3 a	2253.5 a
M.S.D.	17.3	21.7	N. S.
C.V.	22.7	27	21.2
F Value	1.7	1.6	1

¹This trial was planted on April 29. The 1st stand counts were taken on May 13 and the 2nd stand counts were taken on May 28.

²Inoculated with 60 milliliters of a 1:1 mixture of *Rhizoctonia solani* and *Pythium* sp. on Millet.

³Mean of four replications. Mean followed by the same letter in the same column are not significantly different according to the Waller-Duncan \bar{t} test (K ratio=100).

Table 6. 1999 Cotton In-furrow Fungicide Trial Two. Inoculated with Oats. MAFES, Delta Research and Extension Center, Stoneville, MS¹.

Treatment, formulation, and rate	Percent Seedling Survival ²		Yield in lbs Seed Cotton/A
	May-13	May-28	
No In-furrow Fungicide	23.1 b ³	22.4 c	2131.1 a
Quadris, 2.01F, 6.5 fl oz/A	35.5 ab	36.4 a-c	2090.2 a
Rovral, 4F, 3.3 fl oz/A + Ridomil Gold, 4F, 1.25 fl oz/A	39.1 a	40.8 ab	2257.6 a
Rovral, 4F, 6.6 fl oz/A + Ridomil Gold, 4F, 1.25 fl oz/A	28.4 ab	25.8 bc	2114.7 a
Terraclor Super X, EC, 64 fl oz/A	35.6 ab	37.8 ab	2229.0 a
Terraclor, EC, 64 fl oz/A + Ridomil Gold, 4F, 1.25 fl oz/A	32.9 ab	31.3 a-c	2184.1 a
Flint, EC, 15.5 fl oz/A + Ridomil Gold, 4F, 1.25 fl oz/A	37.4 a	37.8 ab	2192.3 a
Amvac PCNB, 2E, 64 fl oz/A + Ridomil Gold, 4F, 1.25 fl oz/A	40.0 a	42.1 a	1955.5 a
Win-Flo, 4F, 32 fl oz/A + Ridomil Gold, 4F, 1.25 fl oz/A	28.3 ab	30.0 a-c	1873.9 a
Amvac PCNB, 2E, 64 fl oz/A	40.1 a	38.6 ab	2196.4 a
M.S.D.	13.9	15	N. S.
C.V.	22.7	24.8	13.2
F Value	2.3	2.4	0.8

¹This trial was planted on April 29. The 1st stand counts were taken on May 13 and the 2nd stand counts were taken on May 28.

²Inoculated with 100 milliliters of a 1:1 mixture of *Rhizoctonia solani* and *Pythium* sp. on Oats.

³Mean of four replications. Mean followed by the same letter in the same column are not significantly different according to the Waller-Duncan \bar{t} test (K ratio=100).