

**REPORT OF THE SOILBORNE
PATHOGEN COMMITTEE - 1997
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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. Experimental design of all these trials was a randomized complete block with four replications. Plots were four 100-foot rows on 40-inch centers. Granular formulations were applied through applicator boxes mounted on a John Deere 7300 Max-Emerge planter. Liquid formulations were applied with a single 2503 flat fan spray tip over the open furrow using a pressurized CO₂ applicator calibrated to deliver 7gal/A. All plant populations and yield data were collected from the two center rows.

During the middle of April, soil temperatures at four inches were in the upper 60's, but on 22 April a cold front passed through the region bringing rain and cooler temperatures. Soil temperatures dropped into the upper 50's and low 60's and rainfall totaled 6.1 inches for the two week period beginning 22 April. Trials planted prior to this period experienced severe seedling disease pressure and a high incidence of damping-off. The results of one trial are presented in Table 1. In this trial, conditions favorable for seedling disease were so severe that nearly half of the seedlings failed to survive and fungicides failed to improve seedling survival. There were a few differences in plant populations 21 days after planting, but none at 42 days after planting. None of the fungicides improved plant populations at 21 or 42 days after planting over untreated control.

Trials planted in early May, following this extended period of cool, wet weather experienced excellent conditions for seed germination and seedling growth. As a result, there was very little seedling disease pressure or seedling damping-off and fungicides did not significantly improve stands over the untreated controls (data not shown).

Louisiana

K. S. McLean and G. W. Lawrence. (Evaluation of Seed Treatments and In-Furrow Fungicides). Two tests were conducted on the Northeast Louisiana University Layton Farm in 1997 to examine the efficacy of selected fungicides for the control of cotton seedling disease. The tests were

conducted in a field which is continuously cultured in cotton and has a previous history of producing cotton with symptoms of seedling disease. All granular in-furrow treatments were applied at the manufacturers recommended rates through applicator boxes mounted on a John Deere 900 series two row planter. The liquid formulation was applied with a single 8001 spray tip adjusted horizontally over the open furrow utilizing a pressurized CO₂ applicator calibrated to 10 GPA. All seed treatments were applied by the manufacturer. Treatments in each test were arranged in a randomized complete block design with five replications. Plots consisted of two rows 40 feet long and on a 40 inch row spacing. Plots were planted April 18, 1997. Cotton stand was determined weekly or six weeks after planting to determine the percent seedling stand loss due to damping off of the cotton seedlings. Cotton seedlings were collected and aseptically plated to Potato Dextrose Agar to isolate and identify the specific fungi present. All plots were hand harvested September 24, 1997 to determine the effects of the treatment on cotton yields.

In Test 1, no significant increases in seedling stand per 40 foot of row were observed between treatments (Table 2). However, yield was increased by ACT, Ridomil PC 11G, Delta Coat AD, and TSX 18.8G by 194, 145, 63, and 44 lb/a respectively (Table 3). In Test 2, at 28 and 42 days after planting seedling stand was significantly greater in all seed treatments compared to the control (Table 4). Yields were also increased over the control in six of the ten treatments (Table 5).

Mississippi

W. E. Batson, Jr. and J. C. Caceres - (Evaluation of Ridomil Gold PC and Ridomil Gold-Rovral for cotton stand establishment). An experiment was conducted at the Plant Sciences Research Center at Mississippi State University to compare selected granular and liquid combinations of in-furrow fungicides for control of the cotton seedling disease complex. Four in-furrow treatments were compared to a no in-furrow treatment control in a randomized complete block designed experiment with four replications. Plots were two 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 grams of each per 40 row feet. One hundred twenty seed (Deltapine 50, commercially treated with Baytan/Thiram + Apron + Kodiak + Epic) were planted per 40 row feet for all plots with a Case-IH model 800 Early Riser planter equipped with Kincaid seed cones. Granular fungicides were applied through Kincaid Belt-Seed cones. Liquid 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 18 April, 1997 and soil temperature averaged 66 F at seed depth.

The two granular formulations and the Ridomil Gold-Terraclor combination significantly increased seedling survival over that of the no in-furrow control (see Table 6). The Ridomil Gold-Rovral combination did not appear to provide any additional protection to seedlings over that already provided by commercially treated seed. A significant increase in yield over the commercially treated seed check was obtained in plots that received Ridomil Gold PC.

Mississippi

W. E. Batson, Jr. and J. C. Caceres - (Evaluation of Rovral 4CF for control of the cotton seedling disease complex). Two trials were 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. Experimental design was a randomized complete block with four replications. Plots were two rows by 40 feet and were artificially infested with *Pythium* and/or *Rhizoctonia*. 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 grams of each per 40 row feet. 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. Liquid 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.

In the first trial, Rovral 4CF, at two rates, was combined with Ridomil Gold or Terrazole and compared to Terraclor Super X EC in plots artificially infested with *Rhizoctonia solani* and *Pythium ultimum*. The experiment was planted on 20 May, 1997 and soil temperature averaged 74 F at seed depth. All in-furrow applications led to significant increases in final stand (Table 7). The 3.4 oz. rate of Rovral was statistically equivalent to the 6.8 oz. rate and Ridomil Gold and Terrazole appeared to be equally effective. However, none of the Rovral treatments was as effective in aiding stand establishment as Terraclor Super X EC. There was no significant treatment effect on yield.

In the second trial, rates of Rovral and Terraclor were compared in plots artificially infested with 2 grams of *R. solani* per 40 row feet. The experiment was planted on 24 April, 1997 and soil temperature averaged 65 F at seed depth. Significant increases in stand (Table 8) were obtained in plots that received Terraclor. The 64 oz. rate of Terraclor led to a significant increase in yield.

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 25. The experimental design was a randomized complete block with four replications. Plots were 40 feet long and planted on 40 in centers. Fifty milliliters of a 1:1 mixture of *Rhizoctonia solani* and *Pythium* spp. infested fall *Panicum* were applied in planters 1 and 2, in-furrow by means of belt cones at planting (high disease pressure). Fifty milliliters of a 1:1 mixture of *Rhizoctonia solani* and *Pythium* spp. infested oats were applied in planters 3 and 4, in-furrow by means of belt cones at planting (medium disease pressure). 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 plots were taken on May 13 and May 26. Plots were harvested by means of a two row picker modified for plot harvesting. All of the treatments had significantly higher seedling counts on both counting dates and significantly higher seed cotton yields over the untreated check in the plots inoculated with *Panicum* (high disease pressure) (Table 9). In the plots inoculated with oats (medium disease pressure), several of the treatments had significantly higher seedling stand counts on one or both of the counting dates. However, none of the treatment yielded significantly higher over the untreated check (Table 10).

Tennessee

A. Y. Chambers. I estimated that we had 9.5 percent loss in Tennessee due to seedling diseases. We had a lot of seedling disease pressure and some replanting. Wet conditions precluded many growers from doing a whole lot of replanting. As a result, there were a lot of skimpy stands and poor vigor plants which translated into poor yields. Conditions were too severe for in-furrow fungicides to be effective in numerous situations. The experiment that I usually report on for the soil fungicide report was planted April 18. Weather conditions were so bad for about three weeks that none of the seven fungicides were able to get and maintain a stand in the no-till plots. Some of the conventional plots also had greatly reduced stands and sickly plants with damaged roots. The whole experiment was replanted May 16, and with greatly improved weather conditions, stands, vigor, root ratings, skips, and yields were not significantly improved by any of the fungicide treatments over no treatment. However, stands, vigor, and yields were significantly lower, and root ratings and skip indexes were significantly higher in no-till compared to conventional planting even at the May 16 replanting date.

Table 1. Effect of experimental fungicides on plant populations and seed cotton yield, Red River Research Station, Bossier City, LA 1997.

Treatment	Rate (prod/a)	Plant Population ¹		Seed Cotton (lb/a)
		21 DAP	42 DAP	
Untreated	---	180 ab	190 a	1469 ab
Ridomil Gold-PC 10.5G	7.0 lb	204ab	212 a	1330 b
Terraclor Super X 18.8G	5.5 lb	203 ab	202 a	1679 ab
Ridomil Gold 4 EC + Terraclor 2E	1oz+48oz	189 ab	183 a	1558 ab
Ridomil Gold 4 EC + Rovral 50WG	1oz+1.5l b	208 ab	208 a	1558 ab
ICI 5504 2.08F	5.0 oz	209 ab	192 a	1736 a
ICI 5504 2.08F	7.5 oz	220 ab	198 a	1540 ab
Ridomil Gold 4EC	1.0 oz	223 ab	195 a	1627 ab
Terraclor 2E	48 oz	179 b	182 a	1652 ab
RH 103075 2SC	4.1 oz	198 ab	193 a	1648 ab
RH 103075 2SC	8.3 oz	220 ab	205 a	1402 ab
RH 103075 2SC	16.6 oz	228 a	212 a	1607 ab

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

²Means within a column followed by the same letter are not significantly different according to LSD (P<0.05).

Table 2. Test 1 - Effect of selected fungicides on cotton stand per forty foot of row from 14 to 42 days after planting.

Fungicides	Rate	14	28	42
		DAP	DAP	DAP
Delta Coat AD	11.75 oz/cwt	90.2	100.4	88.6
WE 137	10 oz/cwt	70.4	110.6	99.8
WE 140	11.75 oz/cwt	90.8	108.2	96.8
Ridomil PC 11G	7 lb/a	80.4	116.6	92.6
TSX 18.8 G	8 lb/a	98.8	120.6	104.2
ACT	2 oz/a	85.4	104.6	92.8
Control		100.8	123.2	92.8
FLSD=(0.05)		30.5	32.5	36.7

Table 3. Effect of selected fungicides on cotton plant height and seed cotton yield in pounds per acre.

Fungicides	Rate	Plant Height (cm)	Cotton Yield (lb/a)
Delta Coat AD	11.75 oz/cwt	19.4	2066.3
WE 137	10 oz/cwt	16.9	1851.2
WE 140	11.75 oz/cwt	18.3	1958.6
Ridomil PC 11G	7 lb/a	16.0	2147.9
TSX 18.8 G	8 lb/a	20.2	2046.7
ACT	2 oz/a	20.2	2196.7
Control		21.2	2002.7
FLSD=(0.05)		3.3	513.4

Table 4. Effect of selected seed treatments on Stoneville 474 cotton stand per 40 foot of row.

Treatment	Rate oz/cwt	14 DAP	28 DAP	42 DAP
Captan 4000 + NuFlow M + Apron XL	2.5, 1.25, 0.32	130	132	123
Maxim + NuFlow M + Apron XL	0.08, 1.25, 0.32	112	126	117
Maxim + NuFlow M + Apron XL	0.08, 1.25, 0.425	132	142	138
Maxim + NuFlow M + Apron XL	0.08, 1.75, 0.32	131	138	129
WE 120C + NuFlow M + Apron XL	0.24, 1.25, 0.32	128	146	146
WE 120C + NuFlow M + Apron XL	0.24, 1.75, 0.32	111	143	135
WE 120C + NuFlow M + Apron XL	0.48, 1.25, 0.32	117	127	116
Maxim + Dividend + Apron XL	0.08, 1.0, 0.425	132	138	135
RTU Baytan/Thiram + Apron Flowable		137	163	141
Control		90	90	88.4
FLSD (P=0.05)		30.7	23	26.5

Table 5. Effect of selected seed treatments on Stoneville 474 cotton height at 42 DAP and seed cotton yield.

Treatment	Rate oz/cwt	Plant Height (cm)	Seed cotton (lb/a)
Captan 4000 + NuFlow M + Apron XL	2.5, 1.25, 0.32	26.9	2810.9
Maxim + NuFlow M + Apron XL	0.08, 1.25, 0.32	26.0	2741.2
Maxim + NuFlow M + Apron XL	0.08, 1.25, 0.425	25.7	2781.7
Maxim + NuFlow M + Apron XL	0.08, 1.75, 0.32	23.1	2851.8
WE 120C + NuFlow M + Apron XL	0.24, 1.25, 0.32	25.6	2464.4
WE 120C + NuFlow M + Apron XL	0.24, 1.75, 0.32	27.2	2778.3
WE 120C + NuFlow M + Apron XL	0.48, 1.25, 0.32	27.4	2489.9
Maxim + Dividend + Apron XL	0.08, 1.0, 0.425	23.9	2427.2
RTU Baytan/Thiram + Apron Flowable	3.0, 0.75	24.6	2623.7
Control		5.5	847.1
FLSD (P=0.05)		30.7	23

Table 6. Evaluation of Ridomil Gold PC and Ridomil Gold-Rovral for cotton stand establishment. Plant Science Research Center, Mississippi State, MS 1997.

Treatment, Formulation and rate ¹	Surviving Seedlings 05-23-97	Seed Cotton lb/A
No in-furrow	32.8 b ²	2488 b
Ridomil Gold PC, 0.74	48.7 a	3104 a
Terraclor Super X 18.8G, 1.0	44.8 a	2836 ab
Ridomil Gold EC, 0.03 Terraclor 2E, 0.71	53.3 a	3008 ab
Ridomil Gold EC, 0.03 Rovral 50WG, 0.15	32.6 b	2603 ab

¹lb ai/A

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

Table 7. Evaluation of Rovral in combination with Ridomil Gold or Terrazole for seedling survival and seed cotton yield, Plant Science Research Center, Mississippi State, MS 1997.

Treatment, Formulation and rate ¹	Surviving Seedlings 06-19-97	Seed Cotton lb/A
No in-furrow	35.2 d ²	2921
Rovral 4CF, 6.8 Ridomil Gold EC, 2.1	52.6 bc	3217
Rovral 4CF, 3.4 Ridomil Gold EC, 2.1	45.0 c	3129
Rovral 4CF, 6.8 Terrazole 2E, 6.3	54.1 b	3210
Rovral 4CF, 3.4 Terrazole 2E, 6.3	49.9 bc	3031
Terraclor Super X EC, 51	63.1 a	3072

¹Oz product/A

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

Table 8. Comparison of Rovral and Terraclor for seedling survival and seed cotton yield, Plant Science Research Center, Mississippi State, MS 1997.

Treatment, Formulation and rate ¹	Surviving Seedlings 05-22-97	Seed Cotton lb./A
No in-furrow	22.4 c ²	2635 bc
Rovral 4CF, 3.2	29.2 bc	2677 bc
Rovral 4CF, 4.3	25.1 bc	2476 c
Terraclor 2E, 48	35.0 b	3058 ab
Terraclor 2E, 64	41.4 a	3210 a

Table 9. *Inoculated with Fall Panicum, (High Disease Pressure).* MAFES, Delta Research and Extension Center, Stoneville, MS.¹

Treatment, formulation, and Rate per Acre	Percent Seedling Survival (weeks after planting)		Yield in lb Seed Cotton/A
	Two	Four	
Untreated Check	7.0 c ³	3.8 c	943.1 c
UBI-4150 80WG, 22 oz	19.0 b	14.0 b	1992.3 b
UBI-4150 80WG, 29 oz	20.9 b	16.3 ab	2274.0 ab
TSX-EC 2.5 EC, 48 fl oz	19.1 b	14.0 b	1788.1 b
TSX-EC 2.5 EC, 64 fl oz	21.1 ab	15.1 b	2037.2 b
EXP 10794A 4SC, 3.266 fl oz + Ridomil Gold 4 EC, 1.96 fl oz	24.2 ab	17.2 ab	2045.3 b
WIN-FLO 4F, 24 fl oz	29.7 a	24.6 a	2919.0 a
WIN-FLO 4F, 24 fl oz + Ridomil Gold 4EC, 1.96 fl oz	25.6 ab	21.4 ab	2384.2 ab
WIN-FLO 6F, 16 fl oz	21.5 ab	15.7 ab	2253.5 ab
WIN-FLO 6F, 16 fl oz + Ridomil Gold 4EC, 1.96 fl oz	27.1 ab	21.8 ab	2045.3 b
M.S.D. 9.6	9.6	8.9	798.2
C.V.	28.8	35.2	24.8
F. Value	4.0	3.9	3.8

¹Plots were 13.3 ft wide x 40 ft long.

²Percent Stand of 400 seed, 2 rows.

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

Table 10. *Inoculated with Oats (Medium Disease Pressure).* MAFES, Delta Research and Extension Center, Stoneville, MS.¹

Treatment, formulation, and Rate per Acre	Percent Seedling Survival (weeks after planting)		Yield in lb Seed Cotton/A
	Two	Four	
Untreated Check	28.8 d ³	22.6 c	2992.5 ab
UBI-4150 80WG, 22 oz	30.3 cd	24.1 bc	2796.5 b
UBI-4150 80WG, 29 oz	34.6 b-d	33.9 ab	3147.6 ab
TSX-EC 2.5 EC, 48 fl oz	34.8 bc	32.2 a-c	2759.8 b
TSX-EC 2.5 EC, 64 fl oz	34.2 b-d	30.5 a-c	3200.7 ab
EXP 10794A 4SC, 3.266 fl oz + Ridomil Gold 4 EC, 1.96 fl oz	39.8 ab	34.4 ab	3086.4 ab
WIN-FLO 4F, 24 fl oz	41.8 a	38.1 a	3462.0 a
WIN-FLO 4F, 24 fl oz + Ridomil Gold 4EC, 1.96 fl oz	39.6 ab	35.6 a	3070.0 ab
WIN-FLO 6F, 16 fl oz	38.9 ab	37.0 a	3351.7 ab
WIN-FLO 6F, 16 fl oz + Ridomil Gold 4EC, 1.96 fl oz	42.6 a	36.0 a	2784.3 b
M.S.D. 9.6	5.9	10.7	611.0
C.V.	11.1	19.6	10.8
F. Value	5.5	2.8	2.1

¹Plots were 13.3 ft wide x 40 ft long.

²Percent Stand of 400 seed, 2 rows.

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