

**EFFECT OF TERRAZOLE 4E ON *PYTHIUM* spp.
COTTON SEEDLING DISEASE AND SEED
COTTON YIELD OF DPL 5409
Jason Ables and K. S. McLean
Northeast Louisiana University,
Monroe, LA
G. W. Lawrence
Mississippi State University,
Mississippi State, MS**

Abstract

A field research test was conducted to examine the effects of Terrazole 4E at various rates combined with Terraclor 2E for the control of *Pythium* spp. cotton seedling disease. Treatments consisted of Terrazole 4E at 3, 4, 5 and 6 oz/acre each combined with 64oz/acre of Terraclor 2E and an untreated control. Plots consisted of four rows and two of the four rows were inoculated with *Pythium* spp. infested oat seed. From 14 through 42 days after planting, all treated plots contained a significantly greater plant stand compared to the inoculated control. There were no significant differences in plant stands between the rates of Terrazole 4E. At harvest, significantly more nodes per plant recorded in the Terrazole 4E (5 oz/acre) compared to the inoculated control. However, there were no differences in plant height between any of the treatments. Seed cotton yield ranged from 2479.7 to 2116.3 lb/acre in the inoculated Terrazole 4E (5 oz/acre) and the inoculated control respectively.

Materials and Methods

A cotton seedling disease test was conducted on the Northeast Louisiana University Layton Farm in Monroe, Louisiana to determine the effects of Terrazole 4E in combination with Terraclor 2E for control of *Pythium* spp. in cotton seedling disease. This test was located in a field that was naturally infested with *Rhizoctonia solani*, *Thielaviopsis basicola*, *Pythium* spp. and *Fusarium* spp. Treatments consisted of Terrazole 4E at the rates of 3, 4, 5, and 6 oz formulated product per acre combined with Terrazole 2E at 64oz formulated product per acre and an untreated control. Each fungicide was applied at the above rates in the seed furrow at planting. Treatment plots were arranged in a randomized complete block design with five replications.

Cotton plots were planted on April 24, 1996. Plots consisted of four rows 40 feet long with at 40 inch row spacing. Two of the four rows of each plot were inoculated with oat seed infested with *Pythium* spp. Replications were separated by a 20 foot border. Each row was planted with 200 Delta and Pineland 5409 cotton seed per row or 5 seed per foot of row. Cotton seeds were commercially treated

with Captan and Vitavax plus Apron by the manufacturers. All plots were maintained with standard production practices. Cotton plots were monitored weekly for six weeks to determine the percent of pre and post emergence seedling loss due to damping-off of the cotton seedling. Cotton plant growth and yield was determined at harvest by mapping plants. Plant height, nodes per plant, boll number and boll weights were recorded at harvest. Plots were hand harvested on September 25, 1996.

Results and Discussion

Cotton seedlings emerged within 7 days after planting. At 7 days after planting, stand counts ranged from 105.0 to 127.6 plants per 40 feet of row in the Terrazole 4E 4oz/acre and the naturally infested control treatments respectively (Table 1). At 14, 21, 28, and 42 days after planting seedlings stand was significantly greater in all Terrazole 4E treatment rates compared to the inoculated control plot. Seedling stand ranged from 67.8 to 138.4 plants per 40 feet of row in the inoculated control and the Terrazole 4E at 5oz/acre plots respectively at 42 days after planting.

Plant height at harvest ranged from 143.8 to 124.2 cm for the inoculated Terrazole 4E (5oz/acre) treatment and the naturally infested Terrazole 4E (4oz/acre) treatments (Table 2). Cotton plants in the naturally infested Terrazole 4E (3oz/acre) treatment had significantly more nodes per plant (25.4 nodes) compared to the inoculated control (21.5 nodes).

At harvest no significant differences in yield were observed between treatments. Seed cotton yield ranged from 2,477 lb/acre to 2,116 lb/acre in the inoculated Terrazole 4E (5oz/acre) treatment compared to the inoculated control, respectively (Table 2). A seed cotton yield of 2,306 lb/acre was produced in the naturally infested control treatment. Lint yields ranged from 991 lb/acre to 846 lb/acre in the inoculated Terrazole 4E (5oz/acre) and naturally infested Terrazole 4E (3oz/acre) treatments, respectively. There was a 144.2 lb/acre increase in lint cotton yield from the inoculated Terrazole 4E (5oz/acre) treatment compared to the naturally infested control. No increase in lint cotton was observed from any of the naturally infested Terrazole 4E treatments.

Economic Analysis

An economic analysis of all fungicide treatments indicated a positive net return in the inoculated plots under high *Pythium* disease pressure. The positive net return above the direct costs of material was determined using the assumption of a current input prices and the product price of \$0.75 lb of cotton but only under high disease pressure (Table 3). Yield data indicates an average lint yield across the four inoculated Terrazole 4E treatments of 920.7 lb/acre. This is a 74.2 lb/acre increase over the inoculated control.

The value of the additional yield using a market price of \$0.75 per pound is \$55.65 per acre. Using the commercial material (Terrazole 4E and Terraclor 2E) the average cost using the stated rates is \$9.43 per acre. Comparing the additional cost to the additional revenue a \$48.62 per acre return to fungicide used is realized. Therefore sufficient additional revenue is generated to cover fungicide cost when disease pressure is intense.

In comparing the direct cost of the fungicide using the stated rates, cost varied from a high of \$9.76 per acre (Terraclor 2E 64oz/acre plus Terrazole 4E 6oz/acre) to a low of \$9.13 per acre (Terraclor 2E 64oz/acre plus Terrazole 4E 3oz/acre). Comparing the additional revenue and cost of the different materials the Terrazole 4E at 5oz/acre yielded the greatest net return per acre (\$98.60 = 108.15 - 9.55). Gross return for the Terrazole 4E at 4oz/acre was very close at (\$89.89 = 99.23 - 9.34).

Disclaimer

The interpretation of data presented may change with additional experimentation. Information is not to be construed as a recommendation for use or as an endorsement of a specific product by Northeast Louisiana University.

Table 1. Effect of Terrazole 4E on DPL 5409 cotton stand at 7,14, 21, 28 and 42 days after planting.

Fungicide/ Rate/Acre	7 DAP	14 DAP	21 DAP	28 DAP	42 DAP
Inoculated					
Control	121	79	66	65	67
T4E 3oz/a	114	125	121	121	130
T4E 4oz/a	105	127	130	119	122
T4E 5oz/a	106	134	135	134	132
T4E 6oz/a	108	121	118	113	111
Naturally Infested					
T4E 3oz/a	119	138	138	137	134
T4E 4oz/a	105	146	138	139	126
T4E 5oz/a	119	151	140	140	138
T4E 6oz/a	125	142	127	131	133
FLSD (0.05)	22	30	33	34	33

All data based on the means of 5 replications. Means compared using Fisher's least significant difference test.

Table 2. Effect of Terrazole 4E on the plant growth and yield of DPL 5409 cotton.

Fungicide/ Rate/Acre	Plant Height (cm)	Nodes/ Plant	Seed Cotton lb/A	Lint Cotton lb/A
Inoculated				
Control	131.6	21.5	2116	846.5
T4E 3oz/a	136.1	22.9	2227	846.1
T4E 4oz/a	141.0	23.1	2330	978.5
T4E 5oz/a	143.8	23.2	2477	990.7
T4E 6oz/a	135.2	22.5	2410	867.5
Naturally Infested				
Control	131.8	23.5	2306	968.4
T4E 3oz/a	139.7	25.4	2282	867.2
T4E 4oz/a	124.2	24.0	2311	924.4
T4E 5oz/a	140.8	23.4	2378	927.5
T4E 6oz/a	134.5	21.8	2462	960.1
FLSD (0.05)	11.4	3.1	509	

All data based on the means of 5 replications. Means compared using Fisher's least significant difference test.

Table 3. Economic analysis of Terrazole 4E in combination with Terrazole 2E for seedling disease control of cotton.

Fungicide/ Rate/Acre	Cost Acre	Yield vs Control	Gross Value \$0.75 lb	Net Value \$
Inoculated				
T4E 3oz/a	9.13	0.4	0.30	-8.83
T4E 4oz/a	9.34	132.2	99.23	89.89
T4E 5oz/a	9.55	144.2	108.15	98.60
T4E 6oz/a	9.76	21.0	15.75	5.99