COTTON SEEDLING DISEASE AND COTTON PRODUCTION IN LOUISIANA

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Abstract

An in-furrow cotton seedling disease fungicide test was conducted on the Northeast Louisiana University Layton Farm to determine the benefits of selected in-furrow fungicides on cotton seedling disease. Treatments consisted of Start 15G, Start 60WG, Ridomil PC 11G, Terraclor Super X, Rovral 50 WG + Ridomil 2E, SM-9, Temik 15G, Temik/Start 60834A 11G, and an untreated control. All treatments were applied at manufacturers recommended rates in the seed furrow at planting. At 7 days after planting seedling stand ranged from 118.6 to 89.6 plants per 40 feet of row for the Terraclor Super X and Ridomil treatments respectively. By 14 days after planting, the stand in the Rovral + Ridomil and Start 60WG at the low rate were significantly greater than the stand in Temik 15G. At 21, 28 and 42 days after planting, there were no significant differences in stand among treatments. Seed cotton yield ranged from 2040.6 to 1318.4 lb/acre for the Start 15G (5.0oz/acre) to Temik 15G respectively.

Materials and Methods

A cotton seedling disease test was conducted on the Northeast Louisiana University Layton farm in Monroe, Louisiana to determine the benefits of selected in-furrow fungicides on cotton seedling disease. Treatments consisted of Start 15G, Start 60WG, Ridomil PC 11G, Terraclor Super X, Rovral 50 WG + Ridomil 2E, SM-9, Temik 15G, Temik/Start 60834A 11G, and an untreated control. All treatments were applied at manufacturers recommended rates in the seed furrow at planting. The test was located in a field that is naturally infested with *Rhizoctonia solani, Thielaviopsis basicola, Fusarium* spp. *and Pythium* spp.

The experimental design was a randomized complete block design with five replications. Plots consisted of four rows, forty feet in length with a forty inch row spacing. Two of the four row plots were inoculated with oat seed infested with *Pythium* spp. and *Rhizoctonia solani* while the remaining two rows were left naturally infested. Replications were separated by a 20 foot border. Each row was planted with 200 DPL 5409 cotton seed on April 25, 1996. Cotton seed were commercially treated with Captan and Vitavax plus Apron by the manufactures. All 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 seedlings. 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 by seven days after planting. Seedling stand ranged from 89.6 to 118.6 seedlings per forty feet of row in the Ridomil PC 11G and the Terraclor Super X , respectively (Table 1). By 14 days after planting, stand was significantly greater in the Rovral 50WG + Ridomil 2E and Start 60WG (0.54oz/1000rft) compared to the Temik 15 G treatment. However, by 21, 28, and 42 days after planting there were no significant differences in plant stand between any of the treatments. Stand at 42 days after planting ranged from 127 to 140 plants per forty feet of row in the Ridomil PC and Start 15 (7.4oz/1000rft) treatments, respectively.

The Rovral 50WG + Ridomil 2E treatment produced significantly taller plants at harvest compare to the Start 15G (3.75oz/1000rft and 7.4oz/1000rft), and Terraclor Super X treatments respectively (Table 2). The number of nodes per plant ranged from a high of 28.1 to 21.9 per plant. Corresponding with plant heights, the Rovral 50WG + Ridomil 2E treatment produced significantly more nodes per plant than the Start 15G (7.4oz/1000rft) treatments.

Cotton seed yield ranged from 2040.6 lb/acre to 1318.4 lb/acre in the Start 15G (5.0oz/1000rft) and Temik 15G treatments respectively (Table 2). The untreated control treatment yielded 1432.2 lb/acre of seed cotton. The seed cotton yield was significantly greater in the Start 15G (5.0oz/1000rft) compared to Ridomil PC, Start 60WG (0.84oz/1000rft) and Temik 15G treatments. Cotton lint yields ranged from 795.8 to 514.0 lb/acre in the Start 15G (5.0oz/1000rft) and Temik 15G treatments respectively. This was a 281.8 increase in lint cotton.

Economic Analysis

An economic analysis of all fungicide treatments indicated a positive net return above the direct costs of materials using the assumption of current input prices and the product price of $0.75 lb of cotton (Table 3).

Yield data indicates an average lint yield across all treatments of 658.2 lb/acre representing a 85.3 lb/a increase over the control. The value of this additional yield using a market price of $0.75 is $64.00 per acre. Using the commercially available materials (Terraclor Super X, Ridomil PC 11G, and Rovral 50WG + Ridomil 2E) the average cost per acre using the recommended rates is $15.43 per acre. Comparing the additional cost to the additional revenue a $68.02 per acre return to fungicide use is

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realized. Therefore there is sufficient additional revenue generated to cover the extra cost.

In comparing the direct cost of the fungicide used, costs varied from $16.64 per acre (Terraclor Super X) to $12.39 per acre (Ridomil PC). Material costs for the Start 15G, Start 60WG, and Temik/Start formulated combination have not been determined. In comparing the additional revenue and cost of the different materials the Rovral 50WG + Ridomil 2E treatment yielded the greatest net return per acre ($54.73 = 72.00 - 17.27). Gross returns for the Start 15G (7.4oz/1000rft and 5.0 oz/1000rft) and Start 60WG (0.54oz/1000rft) were greater than the Rovral 50WG + Ridomil 2E at $146.25, $167.25 and $166.75, respectively. The Start 15G and 60WG formulated compounds have not been released commercially thus we are unable to compare the net returns of these compound treatments. Average yield data for all Start 15G application rates and Start 60WG found an increased yield over the control of 143 and 92 lb/acre, respectively. The Start 15G and 60WG formulations appear to be highly competitive to the Terraclor Super X, Ridomil PC, and Rovral 50WG + Ridomil 2E.

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 Selected In-Furrow Fungicide on DPL 5409 cotton stand from 7 to 42 days after planting.

Fungicide/ Rate/1000rft	7 DAP	14 DAP	21 DAP	28 DAP	42 DAP
Control	102	141	140	134	131
Start 15G 7,4oz	103	142	142	146	140
Start 15G 5.0oz	104	142	139	141	130
Start 15G 3.75oz	97	137	134	134	135
Ridomil PC 8.4oz	89	135	135	137	127
TSX 12.5G 12.3oz	118	148	143	146	136
Temik/Start 1.1lb/a	95	134	132	134	130
Temik 15G 3.5lb/A	103	132	133	135	136
Rovral 0.5oz + Ridomil 0.6oz	101	151	148	144	132
SM-9 1pt/a	109	142	137	138	131
Start 60WG 0.84oz	109	136	138	135	136
Start 60WG 0.54\z/a	115	150	135	137	134
FLSD (0.05)	20	17	17	16	16

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

Table 2. Effect of Selected In-Furrow Fungicide on DPL 5409 cotton plant growth and yield.

Fungicide/ Rate/Acre	Plant Height (cm)	Nodes/ Plant	Seed Cotton lb/A	Lint Cotton lb/A
Control	143	24.4	1432	573
Start 15G 7,4oz	131	21.9	2021	768
Start 15G 5.0oz	156	25.7	2040	796
Start 15G 3.75oz	137	23.8	1536	584
Ridomil PC 8.4oz	156	26.1	1402	575
TSX 12.5G 12.3oz	132	22.1	1852	648
Temik/Start 1.1lb/a	143	26.9	1730	692
Temik 15G 3.5lb/A	149	25.7	1318	514
Rovral 0.5oz + Ridomil 0.6oz	159	28.1	1671	668
SM-9 1pt/a	143	26.4	1710	667
Start 60WG 0.84oz	158	25.0	1372	535
Start 60WG 0.54\z/a	145	24.5	2034	794
FLSD (0.05)	10	5	608	608

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

Table 3. Economic analysis of Commercially Available Fungicides for seedling disease control of cotton.

Fungicide/ Rate/Acre	Cost/ Acre $	Yield vs Control	Gross Value $0.75lb	Net Value $
Start 15G 7,4oz	ND	195	146.25	ND
Start 15G 5.0oz	ND	223	167.25	ND
Start 15G 3.75oz	ND	11	8.25	ND
Ridomil PC 8.4oz	12.39	2	1.50	-10.89
TSX 12.5G 12.3oz	16.64	75	56.25	39.61
Temik/Start 1.1lb/a	ND	119	89.25	ND
Temik 15G 3.5lb/A	11.20	-59	-44.25	-55.45
Rovral 0.5oz + Ridomil 0.6oz	17.27	96	72.00	54.73
SM-9 1pt/a	ND	94	70.50	ND
Start 60WG 0.84oz	ND	-38	28.50	ND
Start 60WG 0.54\z/a	ND	221	166.75	ND

ND=cost not determined at this time.