

**EFFECT OF SELECTED FUNGICIDES FOR COTTON
SEEDLING DISEASE MANAGEMENT
ACROSS THE COTTON BELT**

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Abstract

Twenty cotton seedling disease fungicide tests were conducted across eight states in 2000. Fungicides examined included Terraclor Super X 18.8G and EC, Terraclor 2E and 15G, Rovral 4CF, Ridomil Gold 11PC and EC, Quadris 2SC and Delta Coat AD. At 14 days after planting, Terraclor Super X 18.8G, Terraclor Super X EC and Quadris 2SC increased stand over the control by 17.4 to 20.2 plants per plot. By 28 days after planting the increased stand over the control had increased to 20 to 25 plants. Seed cotton yield was increased over the control by 7 of the 9 fungicide treatments with an average increase of 98 lb of lint. The average fungicide cost was \$9.16 per acre. The average net value increase in cotton yield over the control at \$0.55 lb was \$53.90 with an average return to the producer of \$ 47.48.

Introduction

Seedling disease of cotton is a major problem across the cotton belt. Seedborne and soilborne organisms, acting singly or in combination produce the seedling disease complex of cotton. The seedling disease complex is composed of several fungi which cause serious problems wherever cotton is grown. The soil borne pathogens most commonly involved in the seedling diseases complex include *Rhizoctonia solani*, *Thielaviopsis basicola*, *Fusarium* spp., and *Pythium* spp. The effects of seedling root rot are often subtle and lead to long lasting weakness of the plant and there by reduce yields. Losses attributed to seedling disease, across the cotton belt, total approximately 2.78 (551,946 bales lost) in 1999.

Many growers rely on the use of fungicides for seedling disease management. Fungicides are applied as a seed treatment or in-furrow at planting. The expected results of the addition of these fungicides are to reduce the incidence of seed decay prior to germination or damping off of the cotton seedlings. This reduces the number of uneven skips in the field which in turn increases yield. The fungicide also benefit the cotton plant by reducing seedling root rot which leads to long-lasting weakness of the plant.

The objective of our research was to examine the influence of selected fungicides tested in 2000 for control of the seedling disease complex of cotton and subsequent effects on the growth and development of the cotton plant and yield responses.

Materials and Methods

Tests were conducted to examine the utility of at plant applications of selected fungicides for cotton seedling disease management in a cotton production system. Twenty tests were conducted across eight states which included Alabama, Arkansas, Georgia, Louisiana, Mississippi, Missouri, South Carolina and Tennessee. Fungicides examined included Terraclor Super X 18.8G and EC, Terraclor 2E and 15G, Rovral 4CF, Ridomil Gold 11PC and EC, Quadris 2SC and Delta Coat AD (Table 1). Each fungicide was applied at the manufacturers recommended rates in the seed furrow at

planting except for the Delta Coat AD which was applied to the seed before planting.

Plots consisted of 2 or 4 rows 25 to 100 foot long and 36-40 inch row spacing depending on location. Treatments were arranged in a randomized complete block design with four to six replications. Tests were planted between April 6 and May 8. Plots were rated biweekly for six weeks after planting to determine the percent seedling loss due to damping off of the cotton seedlings. Cotton seedlings were collected and aseptically plated on Potato Dextrose Agar to isolate and identify the specific fungi present.

Results and Discussion

All tests plots emerged within 5 to 14 days after planting. Seedling disease was observed in most tests. At 14 days after planting, Terraclor Super X 18.8G, Terraclor Super X EC and Quadris 2SC increased stand over the control by 17.4 to 20.2 plants per plot (Figure 1). All other fungicides increased stand by 4 to 10 plants per plot. Plants per foot of row ranged from 2.38 to 1.65 for the Terraclor Super X EC and Delta Coat AD treatments, respectively. By 28 days after planting, Terraclor Super X 18.8G, Terraclor Super X EC and Quadris 2SC continued to increased stand over the control by 20 to 25 plants (Figure 1). All other fungicides increased stand by 4 to 15 plants. Plants per foot of row ranged from 2.74 to 2.14 for the Terraclor Super X EC and control treatments, respectively. Thus the use of fungicides in cotton production systems over the southeast and mid south increased the cotton stand per plot at 14 and 28 days after planting in 2000.

Seed cotton yield was increased over the control by 7 of the 9 fungicide treatments when averaged over all tests in the eight states (Figure 2). The average increase in cotton production over the control ranged from 864 to 160 lb/a of seed cotton.

Economic Returns

An economic analysis indicates that seven fungicide treatments had positive net returns above direct cost of the materials using the assumption of an average input price and the product price of \$0.55/lb of cotton (Table 2).

Yield data indicates an average lint yield across treatments representing at 98 lb/a increase over the control. The value of this additional yield using a market price of \$0.55/lb is \$53.90/acre. Using the nine commercial materials the average cost per acre using rates in the experiment is \$9.16/acre. Comparing the additional cost to the additional revenue of \$47.48/acre return to fungicide use is realized. Therefore sufficient additional revenues are generated to cover all extra cost.

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Table 1. Selected fungicide and rates used in the 2000 season.

Fungicide	Rate
Terraclor Super X 18.8G	8 to 5.5 lb/a
Terraclor Super X EC	48 fl oz/a
Terraclor 2E	96 to 48 fl oz/a
Terraclor 15G	5 lb/a
Rovral 4CF	6.0 to 3.4fl oz/a
Ridomil Gold 11PC	7 lb/a
Ridomil Gold EC	1.0 to 3.3 fl oz/a
Quadris 2 SC	7.5 to 5.27 fl oz/a
Delta Coat AD	11.75 fl oz/cwt

Table 2. Economic analysis of the selected fungicides.

Fungicides	Cost/Acre	Gross Value	Net Value
Terraclor Super X 18.8G	12.00	180.57	168.57
Terraclor Super X EC	10.4	79.00	68.52
Terraclor 4E	5.36	66.88	61.52
Terraclor 15G	8.35	120.46	111.71
Rovral 4F	6.80	43.47	36.67
Ridomil Gold 11PC	12.60	-11.08	- 23.68
Ridomil Gold EC	1.86	-33.44	- 35.30
Quadris 2SC		74.82	61.49
Delta Coat AD	4.00	50.99	46.99