

## MANAGING SEEDLING DISEASE IN HILL-DROP COTTON: IMPROVED STANDS MAY NOT IMPROVE YIELD

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### Abstract

In 2001 and 2002, trials were established on the R. Wansley farm, Elbert Co., in fields with histories of stand losses to sore shin caused by *Rhizoctonia solani*. At-plant fungicide treatments included Prevail (carboxin + metalaxyl + PCNB), 12 oz/cwt, and Terraclor Super X 18.8G (etridiazole +PCNB), 5.7 lb/A. Commercial seed (BXN 47) alone was the control. Seed was “hill dropped” in a randomized complete block design with five replications on 1 May 2001 and 26 Apr 2002. In 2001 and 2002, TSX 18.8G significantly increased stand (327 and 253 plants/100 ft, respectively) over the control (270 and 156 plants/100ft, respectively) and Prevail (256 and 178 plants/100 ft, respectively). TSX 18.8G also significantly lowered the skip index, a measure of the distribution of dead plants. Seed cotton yields were similar among treatments in 2001 (3200, 3238, and 3219 lb/A for TSX 18.8G, control, and Prevail, respectively) and in 2002 (836.7, 772.5, and 756.4 lb/A for TSX 18.8G, control, and Prevail, respectively).

### Introduction

“Sore shin”, caused by the fungal pathogen *Rhizoctonia solani*, is the most widespread and destructive seedling disease of cotton in Georgia. It is estimated that in 2001, losses and management costs associated with seedling disease of cotton reached over 13 million dollars. Sore shin is of particular importance in Elbert County because heavier soils and the cool early season temperatures can favor the disease. Also, some fields in the county have been in continuous cotton production for many years, which increases the severity of the disease. To minimize losses associated with seedling diseases, cotton growers attempt to plant under favorable environmental conditions, plant seed treated with fungicides, and may use additional fungicides applied either in the hopper box or in the open furrow at planting. The objective of this study was to evaluate and compare the effectiveness of a hopper box fungicide treatment and an in-furrow granular treatment to reduce losses (stand and yield) to sore shin.

### Materials and Methods

Field trials were established in 2001 and 2002 at the Rick Wansley farm in Elbert Co., GA. Cotton had been planted continuously on the sites for a number of years and seedling disease was common. The experimental design was a randomized complete block with five replications. Plots were four rows wide by the length of the field (500-900 ft). Cotton (‘BXN 47’) was hill-dropped planted on 40 in. rows on 1 May 2001 and 26 Apr 2002. The hill-drop planting technique was used to help seedlings emerge through soil crust. Treatments included 1) commercially treated seed (\$19.20/A), 2) commercially treated seed + 12 oz Prevail (carboxin + metalaxyl + PCNB) per 100 lb seed (\$2.44/A), and 3) commercially treated seed + 5.7 lb/A Terraclor Super X 18.8G (PCNB + etridiazole) (\$12.54/A) applied in-furrow. Cool temperatures following planting were favorable for the development of seedling disease. The fields were non-irrigated; fertility, weed, and insect control followed recommendations for the University of Georgia’s Cooperative Extension Service. Stand counts (two 100-ft transects per plot) were taken 20 and 34 days after planting (DAP) in 2001 and 14 and 34 DAP in 2002. Skip indices (a measure of the patchiness and lost feet of row) were evaluated at the time of the second stand counts. Plots were harvested on 3 Oct 01 and 14 Oct 02. Plots yields were measured in the boll buggy with highway scales. Data was analyzed with SAS (Proc GLM) and mean separation ( $p \leq 0.05$ ) with Fisher’s protected least significant difference test.

### Results and Discussion

Stand-loss from sore shin caused by *Rhizoctonia solani* was common in the field trials in 2001 and 2002. Growing conditions were ideal in 2001 and yields were exceptional in all treatments. Despite a significant improvement in stand count with the use of Terraclor Super X 18.8 G and a significant reduction in the skip index (Table 1), there was no significant difference in yield among the treatments. Again in 2002, stand was significantly improved and the skips reduced with the use of Terraclor Super X (Table 2). In 2002, there was a numerical, but not statistically significant increase in yield with the use of Terraclor Super X. Growing conditions were dry and generally unfavorable during 2002 and yields for all treatments were low. In both season, results with Prevail and commercial seed were similar. Despite significant losses in stand, remaining

cotton plants in this study were able to compensate and maintain yields; perhaps by producing more bolls per plant with greater plant spacing.

### Conclusions

In this two-year study, the use of Terraclor Super X applied in-furrow at planting was effective in increasing plant populations and decreasing stand loss over either seed alone or seed plus a Prevail hopper box treatment. However, yields were not significantly different among treatments in either year. Future work will focus on the possibility of reducing seeding rates with the use of an in-furrow fungicide to maintain stand and yields.

Table 1. Results from 2001 field trial on the R. Wansley farm.

Treatment and rate/A	Skip Index <sup>z</sup> 34 DAP	# Plants / 100 row feet		Yield <sup>y</sup> lb/A
		Emergence 20 DAP	Stand 34 DAP	
Commercial seed alone.....	25.6 a <sup>x</sup>	328.2 a	269.6 b	3238 a
Prevail (hopper box), 12 oz/cwt.....	29.0 a	321.4 a	255.6 b	3219 a
Terraclor Super X 18.8G, 5.7 lb.....	10.4 b	343.2 a	326.8 a	3200 a

<sup>z</sup>Skip Index for 100 feet: missing stand 12-18 inches in length assigned a value of 1; a score of 1 was added for each 6-inch increase in a given skip.

<sup>y</sup>Yield is for seed cotton.

<sup>x</sup>Means followed by the same letter do not differ significantly as determined by Fisher's Protected LSD (P•0.05).

Table 2. Results from 2002 field trial on the R. Wansley farm.

Treatment and rate/A	Skip Index <sup>z</sup> 34 DAP	Plants / 100 row feet		Yield <sup>y</sup> lb/A
		Emergence 20 DAP	Stand 34 DAP	
Commercial seed alone.....	76.4 a <sup>x</sup>	204.8 b	156.4 b	772.5 a
Prevail (hopper box), 12 oz/cwt.....	73.4 a	217.2 b	177.8 b	756.4 a
Terraclor Super X 18.8G, 5.5 lb.....	36.2 b	278.8 a	253.4 a	836.7 a

<sup>z</sup>Skip Index for 100 feet: missing stand 12-18 inches in length assigned a value of 1; a score of 1 was added for each 6-inch increase in a given skip.

<sup>y</sup>Yield is for seed cotton.

<sup>x</sup>Means followed by the same letter do not differ significantly as determined by Fisher's Protected LSD (P•0.05).