1998 Cottonseed Variety and Fungicide Evaluation

Tim C. Knowles, Bruce Odom, and Del Wakimoto

Abstract

Two upland cotton varieties (Deltapine 5415 and SureGrow 125) were subjected to various seed fungicide treatments to determine seedling emergence and vigor in a Mohave Valley field prone to Rhizoctonia infection of cotton seedlings. During 1998, cotton seedlings in this field exhibited symptoms associated with Rhizoctonia, Pythium, and Thielaviopsis fungi. Of the treatments examined in this study, Baytan+Thiram+Allegiance or Baytan+Ascend+Allegiance cotton seed treatments provided superior seedling disease protection. The Protégé+Allegiance fungicide treatment provided superior seedling disease protection when applied to Deltapine 5415 cotton seed, however seedling disease suppression was poor when the same treatment was applied to SureGrow 125. The Vitavax-PCNB+Allegiance and NuFlow M+Maxim+Apron were the least effective fungicide seed treatments examined in this study.

Introduction

Earliness and maximum cotton lint yields are highly dependent on establishment of a uniform and vigorous stand. Earliness allows cotton to complete its primary fruiting cycle prior to August, substantially reducing heat stress related yield losses. Cotton producers can avoid significant yield losses and costly replanting caused by seedling diseases with currently available seed treatment options. Some growers add additional fungicide treatments in furrow, or to cottonseed in the hopperbox at planting, if the field has a history of *Rhizoctonia* and other seedling diseases.

Cool weather is the most important factor influencing seedling vigor and stand establishment. An early planting date is essential for earliness and to realize maximum yield potential. An optimum early planting date takes into account soil temperature, weather conditions, and variety. Optimum soil temperatures for planting are 65^{o} F at 8 a.m. with a favorable 5 day forecast (no cool fronts or storms). When planted into cool soil, large seeded Stoneville and SureGrow type cotton varieties seem to have higher emergence rates and seedling vigor, compared to small seeded Deltapine type cotton varieties.

.

Materials and Methods

A field experiment was conducted during 1998 in Mohave Valley (located in southwestern Mohave County) to determine the effectiveness of cottonseed fungicide treatments applied to two upland cotton varieties for optimum stand establishment in a field with a history of *Rhizoctonia* seedling disease. Seed treatments are outlined in tables 1, 2, and 3. The two upland cotton varieties Deltapine 5415 and SureGrow 125 were planted with a 6 row John Deere 7100 Maxi-Merge at approximately 16 lbs seed/acre. The resultant seeding rates were 91,200 and 64,400 seed/acre for Deltapine 5415 and SureGrow 125, respectively. Individual plots were two rows wide by the length of the irrigation run (800 feet) and each treatment was replicated five times in randomized complete blocks. Cotton was planted wet April 21. Plant

emergence was measured by counting cotton plants in 1/1000 acre portions of row within each plot. Emergence was measured on a weekly basis up to 5 weeks after planting. Five plants were sampled from each plots at 7 weeks after planting to determine the location of the first fruiting branch.

Results and Discussion

Weather conditions for the April 9 Mohave Valley planting were somewhat favorable for germination and emergence of cotton seedlings. Soil temperatures at the two inch depth at 8:00 a.m. ranged from 57 to 66 degrees F from April 19 to 23. Of the two upland cotton varieties examined in this study, Deltapine 5415 had the smallest seed (5,800 seeds/lb) and SureGrow 125 had the largest seed (4,800 seeds/lb). During 1998, cotton seedlings growing in this study exhibited symptoms associated with *Rhizoctonia, Pythium,* and *Thielaviopsis* fungi.

SureGrow 125 cotton seed treated with Baytan+Thiram+Allegiance, Baytan+Ascend+Allegiance, or Baytan+Thiram+Allegiance+PGR resulted in the highest seedling emergence ratings (74-80%) observed in this study (Table 1). The Vitavax-PCNB+Allegiance, Protégé+Allegiance, and NuFlow M+Maxim+Apron cotton seed treatments (49-53% seedling emergence) seemed to provide less protection from cotton seedling diseases than the other SureGrow 125 cotton seed treatments used. Seedling emergence rates of all fungicide treatments (49-80%) were not significantly different than that of the untreated control (66%). Unfortunately, seedling disease symptoms were not distributed uniformly throughout all of the field plots.

Deltapine 5415 cotton seed treated with Baytan+Thiram+Allegiance, Protégé+Allegiance, or Baytan+Thiram+Allegiance+PGR resulted in seedling emergence ratings (76-80%) significantly higher than that of the untreated control (58%) which is shown in Table 2. The Baytan+Ascend+Allegiance, and NuFlow M+Maxim+Apron Deltapine 5415 cotton seed treatments resulted in seedling emergence ratings (70-73%) that were only slightly better, but not significantly different than than that of the untreated control (58%).

Hopper box fungicide applications of Prevail to SureGrow 125 cotton seed at planting did not significantly affect seedling emergence rates (74%) observed in this study, compared to the untreated control (73%) which is shown in Table 3.

Location of the first fruiting branch node was primarily influenced by plant population and variety. Deltapine 5415 had a tendency to set the first fruiting branch one to two nodes higher than SureGrow 125. Increasing plant population increased the height of the first fruiting branch node on the mainstem.

Acknowledgment

The valuable cooperation, land, and resources provided by Del Wakimoto of Ft. Mohave Avi Kwa ›Ame Farm and Bruce Odom of Gustafson are highly appreciated.

Table 1. Effects of cotton seed fungicide treatments on seedling emergence five weeks after planting and the location of the first fruiting branch of the SureGrow 125 upland cotton variety.

Fungicide Seed Treatment*	Fungicide Rate (oz/cwt seed)	Plant Population (#/acre)	Seedling Emergence (%)	1st Fruiting Branch Node (#)
1. Control	None	42,400 abcd	65.8 abcd	5.6 a
2. Baytan 30 Thiram 42S Allegiance Fl	0.5 3.0 0.75	51,400 a	79.8 a	5.4 a
3. Baytan 30 Ascend Allegiance Fl	0.5 2.0 0.75	49,200 ab	76.4 ab	5.2 a
4. Vitavax-PCNB Allegiance Fl	6.4 0.75	34,400 bcd	53.4 bcd	5.8 a
5. Protégé Allegiance Fl	0.64 0.75	31,600 d	49.1 d	5.6 a
6. NuFlow M Maxim Apron XL	1.25 0.08 0.32	33,800 cd	52.5 cd	5.4 a
7. Baytan 30 Thiram 42S Allegiance PGR	1.0 3.0 0.75 2.0	47,400 abc	73.6 abc	5.6 a

* All cotton seed was treated with purple colorant @ 1 oz/cwt, CaCO3 @ 8 oz/cwt, and DynaCoat @ 2.5 oz/cwt.
Means within columns followed by the same letter are not significantly different at the 0.05 level of probability according to Duncans:s Multiple Range Test.

Table 2. Effects of cotton seed fungicide treatments on seedling emergence five weeks after planting and the location of the first fruiting branch of the Deltapine 5415 upland cotton variety.

Fungicide Seed Treatment*	Fungicide Rate (oz/cwt seed)	Plant Population (#/acre)	Seedling Emergence (%)	1st Fruiting Branch Node (#)
1. Control	None	53,300 b	58.1 b	7.0 a
2. Baytan 30 Thiram 42S Allegiance Fl	0.5 3.0 0.75	69,000 a	75.7 a	6.8 ab
3. Baytan 30 Ascend Allegiance Fl	0.5 2.0 0.75	66,600 ab	73.0 ab	6.2 c
5. Protégé Allegiance Fl	0.64 0.75	72,800 a	79.8 a	7.0 a
6. NuFlow M Maxim Apron XL	1.25 0.08 0.32	64,200 ab	70.4 ab	6.4 bc
7. Baytan 30 Thiram 42S Allegiance PGR	1.0 3.0 0.75 2.0	72,000 a	78.9 a	6.6 abc

* All cotton seed was treated with purple colorant @ 1 oz/cwt, CaCO3 @ 8 oz/cwt, and DynaCoat @ 2.5 oz/cwt.
Means within columns followed by the same letter are not significantly different at the 0.05 level of probability according to Duncan=s Multiple Range Test.

Table 3. Effects of a cotton seed hopper box fungicide treatment on seedling emergence five weeks after planting and the location of the first fruiting branch of the SureGrow 125 upland cotton variety.

Fungicide Treatment	Fungicide Rate (oz/cwt seed)	Plant Population (#/acre)	Seedling Emergence (%)
1. Control	None	46,200 a	72.7 a
2. Prevail	8.0	47,800 a	74.2 a

Means within columns followed by the same letter are not significantly different at the 0.05 level of probability according to Duncan=s Multiple Range Test.