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Effect of Seed Soybean Treatments on Seed Emergence and Yield

Abstract

The purpose of this study was to evaluate soybean seed treatments on disease pressure. There have been experimental plots for seed treatment evaluation at the McNay Research Farm for the last three years. The McNay farm was selected for seed treatment experimental plots because it exhibited a high level of phytophthora damping off the spring of 1999. The objective of this study is to determine the effect of different seed treatments on seedling diseases under high disease pressure as expressed by stand establishment, plant vigor, and harvest yield.

Keywords

Plant Pathology

Disciplines

Agricultural Science | Agriculture | Plant Pathology

Effect of Seed Soybean Treatments on Seed Emergence and Yield

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Introduction

The purpose of this study was to evaluate soybean seed treatments on disease pressure. There have been experimental plots for seed treatment evaluation at the McNay Research Farm for the last three years. The McNay farm was selected for seed treatment experimental plots because it exhibited a high level of phytophthora damping off the spring of 1999. The objective of this study is to determine the effect of different seed treatments on seedling diseases under high disease pressure as expressed by stand establishment, plant vigor, and harvest yield.

One experiment compared the effect of different Apron seed treatment formulations to Rival and Allegiance and included Cruiser, a systemic insecticide seed treatment. The second experiment compared the effect of seed applications of Cell-Tech 2000 and Cell-Tech Sci Rhizobium (nitrogen fixing bacteria) combined with fungicides.

Materials and Methods

Field plots were planted on May 31 at the McNay Farm, Chariton. The two studies were

randomized complete block designs of four replications. Plots were 17 feet long with a 3-foot break between plots and were 4 rows wide, planted at 7 seeds/foot.

Emergence data were taken on June 21 and 27. Stand counts were averaged over 10 feet from each of the middle two rows of each plot. Vigor was a visual rating of plant development based on a 1–5 scale averaged across both inner rows. A vigor rating of 1 was poor emergence with uneven plant sizes and poor color, and a rating of 5 was uniform emergence with healthy green color and no visible disease.

On July 25, samples were taken from the Rhizobium experiment for root nodulation. From each plot in two replications, 10 plants were dug, and nodules were counted from each root system and averaged across treatments.

On October 15, fourteen feet of the inner two rows of each plot were harvested for yield. Harvest weights were adjusted to 13% moisture.

Results

Seedling disease pressure was high, with poor emergence and irregular stands. Tables 1 and 2 show the results of individual treatments.

Table 1. Average stand and yield ratings for McNay 2002 fungicide test plots.

Treatment	Emerg.*	Moisture	Bu/A
Apron Maxx RTA 0.159 ES	4.75	7.4	34.3
Apron Maxx RTA 0.159 ES, Apron XL 3 LS	4.72	7.6	36.0
Rival 500 EC, Allegiance-FL	4.60	7.3	32.9
Untreated Control	4.24	7.0	29.5
Average	4.69	7.4	33.2

* Average plants per foot

Table 2. Average stand and yield ratings for McNay 2002 Rhizobium test plots.

Treatment	Emerg.*	Vigor**	Nodulation***	Moisture	Bu/A
Cell-Tech 2000	3.95	2.9	34.9	7.3	29.3
Cell-Tech Sci	3.91	3.1	36.6	7.1	30.1
Apron Maxx RTA 0.159 ES	3.89	2.9	37.4	7.4	28.3
Cell-Tech 2000, Apron Maxx RTA 0.159 ES	4.10	3.3	48.1	7.8	34.9
Cell-Tech Sci, Apron Maxx RTA 0.159 ES	4.51	2.6	42.4	7.8	25.7
Soygard	4.42	2.9	28.3	7.8	28.8
Rival 500 EC, Allegiance-FL	3.78	3.3	41.6	7.8	37.2
Untreated Control	4.05	2.6	31.4	7.8	22.5
Average	4.10	2.9	37.5	7.6	28.4

* Average plants per foot in 6.5 feet of center 2 rows of each plot.

** Based on a scale of 1–5 with 5 a large, healthy, uniform stand and 1 an irregular, sick, stunted stand.

*** Average nodulation counts based on 10 plants from 2 replications per treatment.